
KEYNES, NEWTON AND THE ROYAL SOCIETY: THE EVENTS OF
1942 AND 1943

by

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Most discussions of John Maynard Keynes's activities in connection with Newton are restricted to the sale in 1936 at Sotheby's of Newton's Portsmouth Papers and to Keynes's 1946 essay 'Newton, the Man'. This paper provides a history of Keynes's Newton-related work in the interim, highlighting especially the events of 1942 and 1943, which were particularly relevant to the Royal Society's role in the domestic and international promotion of Newton's legacy. During this period, Keynes lectured twice on Newton, leaving notes that would later be read by his brother Geoffrey in the famous commemoration of the Newton tercentenary in 1946. In 1943 Keynes assisted the Royal Society in its recognition of the Soviet celebrations and in the acquisition and preservation of more of the Newton library. In each instance Keynes took the opportunity to promote his interpretation of Newton as 'the last of the magicians': a scientist who had one foot in the pre-modern world and whose approach to understanding the world was as much intuitive as it was methodical.

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KEYNES AND THE PORTSMOUTH PAPERS: A REVIEW

The fascination of the economist John Maynard Keynes (1883–1946) with Isaac Newton is well known to Newton scholars, for the simple reason that he played a pivotal role in collecting much of the source material on Newton and safely delivering it to modern historians (the words 'Keynes MS' are ubiquitous in the literature). Keynes took an interest in Newton at least as far back as his studies at Cambridge, when in 1905 he enthusiastically acquired his own first edition of *Principia*,¹ but his purchases at and after the 1936 Sotheby sale are what firmly establish his role in Newton historiography. In July 1936 Viscount Lymington turned over a large collection of Newton's papers (the 'Portsmouth Papers') for sale at Sotheby's. The Portsmouth Papers had been passed down through Lymington's family over two centuries, but were put up for sale to raise money in the face of the family's financial troubles.² Keynes attended the auction at the

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insistence of his brother, Geoffrey. Although he later suggested that he realized the importance of the Portsmouth Papers only after the sale itself, Keynes's enthusiasm at the sale should not be underestimated. He still purchased 39 lots at the auction, a figure second only to Maggs Brothers, a rare book dealer.

What did develop with time was a greater appreciation on Keynes's part for Newton's writings on alchemy, which Keynes was energetically pursuing at Maggs Brothers, and also from others (notably the scholar Abraham Shalom Ezekiel Yahuda) by August 1936.³ Newton was an avid alchemist, particularly interested in the discovery of the Philosopher's Stone, which would allegedly turn base metals into gold, and also the Elixir of Life. But even in the first half of the twentieth century, people were still coy about Newton's occult pursuits. Eddington's 1943 review of Sullivan's biography of Newton in *The Sunday Times* referred to the alchemical activities with considerable discretion by noting that 'the science in which Newton seems to have been chiefly interested, and on which he spent the most time, was chemistry. He read widely and made innumerable experiments—entirely without fruit, so far as we know.'⁴ Eddington did not feel the need to resort to such euphemisms in describing Newton's anti-Trinitarianism elsewhere in his review, but 'alchemy' was apparently too scandalous to attribute so forthrightly, and so it was transmogrified (like base metal into gold) into 'chemistry'. McKie, in 1942 similarly downplayed Newton's occult interests, arguing that these volumes could be found in Newton's library simply because 'alchemical books often gave valuable practical information on the properties of the metals.'⁵ The Whig history of Newton as a rationalist was thus still quite dominant in the early 1940s, offering Keynes an opportunity to help shatter the facade. Keynes suggested that Newton's alchemy was central to understanding his more widely celebrated scientific work. In fact, Keynes was so comfortable with these preoccupations that he joined the Society for the Study of Alchemy in September 1937 (the society studied the study of alchemy, of course; they did not practise it).⁶ In the absence of Keynes's work, historians would of course still have had access to the Lymington material sold in 1936, as well as material available before the sale (although Newton's alchemical activities were steeply discounted and less commonly mentioned, they were not unknown before the 1930s). In that sense, Keynes's contribution was primarily that of an aggregator of material scattered at the time of the sale and a promoter of a new view of Newton.

THE FIRST BRITISH TRICENTENARY CELEBRATIONS, THE CAMBRIDGE LECTURE, AND THE ORIGINS OF 'NEWTON, THE MAN'

It is commonly thought that as a result of the war, the British tricentenary celebrations of Newton were delayed until after Keynes's death, leaving the task of delivering Keynes's lecture to his brother, Geoffrey. This is not entirely true. A smaller tricentenary celebration was held, on time, at the Royal Society's annual meeting on 30 November 1942. After a luncheon following President Dale's annual address, a smaller group gathered to hear Professor Andrade speak on 'Newton and the science of his age', followed by Robert Strutt, 4th Baron Rayleigh, on 'Newton as experimenter' and Sir James Jeans on 'Newton and the science of today'.⁷ A reproduction of Newton's experimental work on refraction accompanied Strutt's lecture, although it was apparently modified from the original. Strutt remarked that 'in spite of our increased control over

nature, we cannot produce a beam of sunlight at pleasure late on a November afternoon, so I must be content to use the electric arc in this experiment.’⁸

The tercentenary celebration in November 1942 is relatively obscure in its own right, overshadowed by the larger 1946 affair. But even more obscure is the fact that Keynes delivered the dinner address at the 1942 event, sharing thoughts that would eventually coalesce into his essay ‘Newton, the Man’. His lecture seems to have been a late addition to the celebrations, because it does not appear in the official programme, nor is it mentioned in accounts of the event by international sources, which do report the lectures delivered that evening by Andrade, Strutt and Jeans.⁹

A transcript of the dinner address is not available among Keynes’s papers at the Newton Project, but an outline of his argument can be reproduced from his subsequent correspondence.¹⁰ In the days after the Society’s Anniversary Meeting, Keynes received gracious letters from Sir Harold Hartley, Professor Andrade and President Dale, thanking him for his lecture and encouraging him to publish his thoughts. Hartley in particular was interested in the content of Keynes’s address, writing to him the next day about Newton’s approach to scientific discovery, and comparing it to Michael Faraday’s:

I was fascinated by your talk to us about Newton last night. . . . Faraday I have always ranked next to Newton, and his mental processes were certainly super normal and remind me very much of what you said of Newton’s last night. As Kohlrausch said [of Faraday], ‘er riecht die Wahrheit’ [‘he smells the truth’].¹¹

Keynes arranged to meet Hartley to discuss Faraday and Newton on 11 December, and it was presumably at this engagement that he acquired Hartley’s 1931 address to the British Association for the Advancement of Science on Faraday. Keynes marked the sections of the address pertaining to Faraday’s thought process, which Hartley found so similar to what Keynes had said about Newton, including Hartley’s assertion that

It is easy to see why Faraday had to work alone with nobody to distract him. In the period of his great achievements, his experiments were rarely continuous, the intervals between them suggesting the subconscious working of his mind. He waited until the impulse came and his ‘prescient wisdom’ had planned the experiment and foreseen the result.¹²

Keynes underlined the last sentence of this passage, which could easily substitute for his own assessment of Newton’s use of experimentation in ‘Newton, the Man’, that ‘His experiments were always, I suspect, a means, not of discovery, but always of verifying what he knew already’.¹³ Keynes repeatedly referenced Newton’s ‘intuition’, calling it ‘pre-eminently extraordinary’, almost to the point of relying on mathematical proof and experiment only as a matter of social convention, rather than as a means of revealing some insight that had not already occurred to him. The mathematical proofs in *Principia* were alleged to be ‘dressed up afterwards—they were not the instrument of discovery.’

Hartley and Keynes agreed with each other on the comparability of Newton and Faraday in their process of discovery and their use of experimentation, but to Keynes Newton was more than just a paragon of scientific intuition. He was ‘the last of the magicians’, a modern genius who nevertheless saw the world through distinctly pre-modern eyes and who gave credence to both alchemy and the mystical significance of revelation and apocrypha. Newton was not merely interested in advancing alchemy as a discipline that had scientific sanction in the seventeenth century. We cannot credit Newton’s alchemy as naive but as scientific, as one might justify Becher or Stahl’s work on phlogiston theory.

Keynes emphasizes that Newton saw his role in pursuing the Philosopher's Stone as that of a recipient of revelation and interpreter of tradition, not as a rationalist or a scientist: 'he was almost entirely concerned, not in serious experiment, but in trying to read the riddle of tradition, to find meaning in cryptic verses, to imitate the alleged by largely imaginary experiments of the initiates of past centuries'. His account of Newton's anti-Trinitarianism is similar:

he arrived at this conclusion, not on so-to-speak rational or sceptical grounds, but entirely on the interpretation of ancient authority. He was persuaded that the revealed documents give no support to Trinitarian doctrines which were due to late falsifications. The revealed God was one God.

Keynes's framing of Newton as something other (or perhaps simply more) than a prince of scientific rationalism was not intended to diminish the man. He clarified:

I believe that Newton was different from the conventional picture of him. But I do not believe he was less great. He was less ordinary, more extraordinary, than the nineteenth century cared to make him out. Geniuses are very peculiar. Let no one here suppose that my object today is to lessen, by describing, Cambridge's greatest son. I am trying rather to see him as his own friends and contemporaries saw him. And they without exception regarded him as one of the greatest of men.¹⁴

On 30 January 1943 Keynes repeated his Newton lecture at Trinity College, Cambridge, for a gathering of students and professors, at the request of Professor Broad.¹⁵ Broad is referenced several times in the notes from the 1943 lecture that were subsequently used by Geoffrey Keynes in the 1946 celebrations. It is plausible that these references were added specifically for the event at Trinity College, as a nod to Keynes's host that evening. In attendance that night was the physicist Freeman Dyson, then just a student. He remembered a small group of attendees congregating around an exhausted Keynes, who rested in a reclining chair while he expounded on Newton. Dyson later recalled that Keynes 'was wearing himself out, flying back and forth between London and Washington and dealing with one financial crisis after another. He never had time to pursue his hobby, the careful scholarly reading of the Newton papers.'¹⁶

The exhaustion that Dyson observed in Keynes was due to tense discussions in late 1942 and early 1943 with the Americans over essential military aid. The Office of Lend Lease Administration was growing uncomfortable with the British accumulation of dollar balances, which it felt implied that further assistance was unnecessary. Keynes argued that the balances were intended to meet 'growing liabilities in other parts of the world', particularly in India and Egypt. These negotiations with the Americans became even more difficult after Republican Congressional victories in November 1942 put pressure on the Roosevelt administration, which otherwise might have been more accommodating.¹⁷

Discussions of Keynes's Newton activities typically focus on two bookend events: the purchase in 1936 of the Portsmouth Papers and the delivery in 1946 of 'Newton, the Man'. It is rarely mentioned that the groundwork for Keynes's interpretation of Newton was laid in 1942 and 1943 when he presented the product of several years of manuscript collecting and reading to selective audiences at the Royal Society and at Trinity College. It was after these exhibitions, in the spring of 1943, that representatives of the Royal Society approached Keynes for advice on several other matters relevant to Newton's

legacy, including the Soviet tercentenary celebrations and the preservation of more of Newton's library.

THE HILL–KEYNES CORRESPONDENCE AND THE SOVIET TERCENTENARY

On 7 February 1943 A. V. Hill, then the Royal Society's Biological Secretary, wrote to Keynes requesting insights on what would constitute an appropriate gift for the Society to send to the Soviet scientific community, in recognition of their 1943 celebrations of the Newton tercentenary.¹⁸ The decision to reach out to Keynes was apparently an afterthought of Hill's, rather than a decision of the Officers of the Society. He wrote that 'We [the Officers of the Royal Society] could not think of anything, but it occurred to me today that, with your interest in Newton and Newton relics, you might be able to think of something appropriate to give them.'

Keynes was enthusiastic about Hill's idea to send a gift to the Soviets, and in fact offered six specific suggestions:¹⁹

- A portrait of Newton by Godfrey Kneller from 1702, which was owned by Newton.
- A smaller portrait, also by Kneller, of an older Newton.
- A letter to Newton from 'Prince Alexander Menzikoff' requesting admission to the Royal Society, and three drafts of Newton's reply.
- A special large copy of the third edition of *Principia*, one of 24 that were printed.
- Two books from Newton's library: a first edition of his own *Principia*, with notes in the margin, that was used in preparing the second edition, and his copy of Barrow's *Euclid*.
- A first edition of *Principia*, said to be obtainable for about £100.

Keynes thought that the two portraits were possessed by Lord Lymington, who had withheld many of the Newton portraits from the Sotheby sale.²⁰ The first portrait was considered by Keynes to be the better specimen, but he confessed a personal attachment to the second. The next two items were in Keynes's own collection, although he expressed some doubt as to whether he would be able to find them. The Menzikoff manuscripts (which in later letters Keynes spelt 'Menchikoff'²¹) were suggested not only for their obvious relevance to the history of Russian science but also out of concern for finding a manuscript 'which could be detached from the rest without too much loss'.²² Newton's *Principia* and his copy of Barrow's *Euclid* were thought by Keynes to still be at Sotheby's, although he remembered them as being in bad condition. The final suggestion of a first edition of *Principia*, which Keynes guessed was not available in Russia, interested him much less than the other suggestions. Nevertheless, the first edition was the option that Hill settled on in his response to Keynes on 16 February.²³

The tone of the whole exchange is casual and familiar (Hill ended his first letter with the reassurance 'We couldn't think of anything, and if you can't, don't trouble to reply'). This is unsurprising, because the author was Keynes's brother-in-law of three decades. Moreover, Hill's representation of Cambridge University in Parliament demonstrated the respect he was still accorded by Keynes's own admirers. The seat was initially offered to Keynes himself, and fell to Hill only after Keynes declined it.²⁴ But the nature of their relationship is probably best captured in the salutation of Keynes's second letter, on 19 February: 'Dear Vivian'. Hill famously despised his given names 'Archibald Vivian', and

insisted on being referred to as 'A.V.'.²⁵ Calling Hill 'Vivian' is a clear example of an intimacy between the two men; Keynes did not feel the need to stand on ceremony with Hill, and was comfortable in teasing him.

The personal connection between the two men is further illustrated when, in his letter of 16 February, Hill turned from Society to Parliamentary business, relaying a request from a fellow 'progressive conservative' MP (A. C. M. Spearman) for insights into how optimistic he could be about the future financing of social security. Hill asks Keynes whether he or one of his 'disciples' would be willing to talk with Spearman, writing that 'the word "optimistic" particularly made me think of you [Keynes]: that's your strong line, as it also is Margaret's [Margaret Hill, A.V.'s wife and Keynes's sister].'²⁶ Keynes declined the request, citing the discretion he wished to maintain while working on these issues with the Treasury.²⁷

Keynes immediately started making inquiries about the first edition of *Principia*, and found a prospective seller through Surridge Dawson, for approximately the £100 he had mentioned previously.²⁸ At this point, Hill reported the progress with the gift for the Soviets to the President of the Society, Sir Henry Dale, and the Treasurer. These representatives of the Royal Society decided that of the two copies of *Principia* available for sale from Dawson, the more expensive copy was in the better condition and was the more appropriate choice. Rather than purchasing the book, the Society obtained it through barter, giving the booksellers several series of journals in exchange.²⁹ In this way they could honestly tell the Soviets that the volume was given out of the Royal Society's library. The acquisition was reported and approved by the officers of the Society on their 4 March meeting.³⁰

Although Keynes initially preferred the option of the Newton paintings, showing more interest in them in his 10 February letter and even confessing a personal attachment to the second painting, the final decision by the Society to send a first edition of *Principia* also met with his approval. The same cannot be said for Hill's views on the preparation of the book for the Soviet celebrations. Hill noted to Keynes that the book's vellum binding was not as old as the book itself, perhaps 150 years old, and argued that 'there would be no great sacrilege therefore in discarding it and rebinding it.'³¹ Hill was acquainted with bookbinding protocol, because it was a favourite hobby of his wife (Keynes's sister).³² Yet here, once again, Keynes's familiarity with A.V. and Margaret provides him with a wide degree of latitude in his response to what really was a matter for the Society to rule on. Keynes responded on 2 March with a letter occupied entirely with the question of the binding of *Principia*, which begins: 'I am deeply shocked by your suggestion of tearing off the vellum binding. You have not a hope of replacing it by anything so suitable or so good. It would be a most wicked act of vandalism! For heaven's sake give up the idea.'³³

Keynes found the final product acceptable on 30 March, although neither the letters in Keynes's collected papers nor the minutes of the Royal Society Officers' meetings clarify what decision was ultimately made about the binding. The minutes of the 4 March Officers' Meeting (two days after Keynes communicated his dismay at the proposal to strip the vellum binding) note only that 'arrangements had been made for it to be suitably bound.'³⁴ Keynes's endorsement of the final product suggests that the vellum binding was left on and imprinted with the seal of the Royal Society (an alternative that Keynes suggested to Hill³⁵).

In addition to noting his approval of the prepared *Principia*, the letter of 30 March once again raised the option of including the correspondence between Menchikoff and Newton in the gift to the Soviets. The letters were apparently for sale by Myers & Co., and Keynes

offered to finance their purchase. Deciding that it was more appropriate for the Menchikoff letters to be funded by the Society, the officers resolved in their meeting of 15 April to thank Keynes but decline his proposal.³⁶

THE SOVIET TERCENTENARY AND SOVIET NEWTON SCHOLARSHIP

The Royal Society's gift arrived for the extensive Soviet celebrations of Newton in 1943, which were honoured in President Dale's 1943 anniversary address:

Last year we devoted this Anniversary Meeting to a simple celebration such as the war conditions allowed of the three hundredth anniversary of the birth of Isaac Newton. We have noted with appreciative interest that other countries also marked the tercentenary year by paying homage to our Newton's memory. Particular mention is due to the commemorative meetings held, under the tremendous stress of war, not only by the Moscow Academy of Sciences, but also in a number of other scientific centres of Soviet Russia, one as far away as Novo-Sibirsk. The Council's Report mentions the gift which we have sent to the Soviet Academy of Sciences of Moscow, in recognition of this union with our colleagues of Soviet Russia in commemorating one of the greatest scientific achievements of all time, as in the present devotion of all that science can give, in both our countries, to the winning of this war for freedom.³⁷

Some of the most noted Soviet scientists who commemorated Newton in 1943 participated in the events held in Kazan, a city 450 miles due east of Moscow. Kazan's role in the scientific life of the USSR expanded considerably in the early 1940s, as research institutes in Moscow, Leningrad and Stalingrad were evacuated to the city during the war. Collaboration between scientists in different fields who were previously spread out across western Russia made Kazan an innovative place to work, but the war took its toll. Soviet scientific output in Kazan reached a nadir in 1943, with only a little over one-third of the publications of 1941. Nevertheless, the academicians in Kazan were prepared for the tercentenary, publishing at least 46 papers or books on Newton in 1943 alone. By far the most famous of these was Sergei Vavilov's biography of Newton, commissioned for the tercentenary and published in January of that year.³⁸ Vavilov was subsequently invited to speak at the larger, better-known British tercentenary celebration in 1946.

Vavilov was a rising star in Soviet science by 1943. In 1931 and 1932 he was elected a corresponding member and ordinary member, respectively, of the Soviet Academy of Sciences. He was employed at the Institute of Physics and Biophysics in Moscow at the time, but in September 1932 he moved to Leningrad to direct two new research institutes and to assist in directing the Leningrad Optical Institute. Vavilov commuted often between Leningrad and Moscow to fulfil the various management responsibilities he was accumulating. In 1935 he was elevated to the Academy's ruling body, the Presidium. Many of these institutes had moved to Kazan by 1943, and Vavilov moved with them.³⁹ In 1945 he was elected president of the Academy.⁴⁰

Vavilov held a traditionalist view of Newton's work and of science as a rational, progressive enterprise that contrasts sharply with the perspective of Keynes in 'Newton, the Man'. Whereas Keynes and Hartley stressed the idiosyncrasy, superstitions and unique intuitions of Newton, for Vavilov Newton represented a mechanical science as predictable and amenable to control as classical physics itself. The principal focus of Keynes's activities on Newton was the alchemical material, and to a smaller extent the theological

material. Vavilov, in contrast, published the first Russian translation of *Opticks* in the 1920s and had also written on Newton's work with light. Speaking of Soviet science in 1948, Vavilov wrote:

There is no possibility, of course, of planning out 'unexpected' scientific results and discoveries; but all true science must contain a very large proportion of well-founded anticipation and prevision. In the seventeenth and eighteenth centuries, for example, Newton's physics might have served as a basis for predicting, and hence planning, the development of physics for a long time ahead. Our contemporary knowledge of the structure of the atom nucleus allows us to plan out for many years to come, with a large degree of confidence, much of the theoretical and experimental work to be done in this field. Contemporary organic chemistry is so constructed that we can see clearly into the future, selecting the most expedient and interesting directions for development in both the practical and the theoretical sphere. In aeroplane construction, empirical formulae have actually been worked out indicating the increase in power of aeroplane motors with the passage of time. Planning is fully 'warranted, even essential, in a number of branches of biology, as for example in animal and plant selection, when the question arises as to the desirability of producing one or another breed or type.

And the complete dedication of our science to the service of the people and the state has made planning in science an absolute necessity. That is one of the chief distinguishing features of science in the socialist state. Such planning includes not only scope—institutions, personnel, equipment—but also content, i.e., the themes of scientific research.⁴¹

In the Soviet literature on Newton, Boris Hessen's influential 1931 paper, 'The social and economic roots of Newton's *Principia*', offers a treatment that is in many ways more comparable to Keynes's perspective than Vavilov's. For Hessen, Newton was a product of his socio-political environment, and the primary shortcoming of *Principia* was its resistance to a more encompassing materialism.⁴² In a similar manner to Keynes's embrace of Newton despite his occult activities, Hessen argued that Newton's class background should not dissuade socialists from recognizing his contribution to physical science.⁴³ In many ways, Hessen's citation of class distinctions with respect to Newton is ironic, given the man's quite modest origins compared with other scientists of his time.⁴⁴

Hessen applied this formula for a sincerely Marxist decoupling of the social context of scientists from their science with even greater force to contemporary advances in relativity and quantum mechanics. Marxists in the Soviet Union, drawing especially on Lenin's own attacks on Ernst Mach in *Materialism and empiriocriticism*,⁴⁵ objected to quantum mechanics on the grounds that it contradicted determinism. Hessen acknowledged the Marxist philosophical and ideological objections to Mach and Einstein, but insisted that this was not relevant to the question of the physical validity of their theories, a distinction he extended to Newton in 1931.⁴⁶

PILGRIM'S TRUST AND THE NEWTON LIBRARY

On 30 March 1943 the Royal Society, through Assistant Secretary Griffith Davies, consulted Keynes on a separate Newton matter: the possibility of acquiring what was referred to as 'the Newton Library' from Sotheran's (a bookseller) for the Society. The 'Library' was a large collection of Newton's books, mostly (according to Keynes's own recollection) on church

history and the early church fathers.⁴⁷ Shortly after the Society's initial inquiries at Sotheran's, however, an option on the Newton Library was obtained by the Pilgrim's Trust, a historic preservation group.⁴⁸ Hill informed Keynes that the Trust would probably decide to house the library at the Royal Society, Trinity College or the British Museum. He preferred the first two options and suggested that Keynes (as a respected Newton collector) contact the Pilgrim's Trust with his own thoughts on the library and views on the most appropriate destination for it.⁴⁹ Keynes, of course, agreed with Hill that the Royal Society or Trinity College would be superior to the British Museum for the purpose (neither man was a truly impartial judge), and even showed a preference for the Royal Society, which he said had an 'extra special' connection to Newton.⁵⁰

On the same day that he responded to Hill, Keynes wrote to Lord Macmillan, a member of the Pilgrim's Trust board, commending the decision to purchase the Newton Library. Still promoting his portrayal of Newton as the 'last of the magicians', Keynes took pains to draw Macmillan's attention to a particular alchemical volume in the library, Agricola's *De Re Metallica*, which Humphrey Newton (Newton's amanuensis and assistant, but no relation to him) claimed was always at Newton's side when he was working on alchemy. Keynes concluded his letter to Macmillan with a case for housing the library at the Royal Society. He wrote:

My own inclination, if I may venture an opinion, would be slightly in favour of the Royal. Their personal, sentimental and historical association with Newton is very special. He is their tutelary god, their one god—there is a bit more polytheism in Trinity.⁵¹

The reference to many gods at Trinity could of course refer to any number of distinguished alumni and affiliates, although there was at least one (Ludwig Wittgenstein) that Keynes actually did refer to in light-hearted admiration as 'god'.⁵² It may also be an allusion to Newton's own anti-Trinitarianism. Ultimately, the Trust decided against Keynes's suggestion and announced on 15 April that it would house the library at Trinity, where it remains today. Keynes's promotion of Newton's alchemical work to the staff of Pilgrim's Trust continued after the announcement. In his letter to Tom Jones on 27 April, he once again raised the importance of *De Re Metallica*, this time suggesting that it was not in the library purchased by the Trust from Sotheran's (as he initially suggested to Macmillan) but was owned by Francis Edwards, who had acquired it at the sale of the Portsmouth Papers.⁵³

These persistent endeavours to promote a more complete picture of Newton in 1942 and 1943 were starting to make an impression. When G. M. Trevelyan, the Master of Trinity College, accepted the library from the Pilgrim's Trust, he noted that 'we have not yet had time to examine Newton's books fully but we already know that they chiefly consist of works of science and mathematics and alchemy, in which Newton was much interested'.⁵⁴ The role of alchemy in Newton's life was only occasionally acknowledged before the Sotheby sale, but by the postwar period some discussion of it was obligatory, thanks largely to Keynes's efforts in the early 1940s. Subsequent efforts by B. J. T. Dobbs and others have ensured mainstream acceptance of Keynes's relatively radical reimagining of Newton in the 1930s.

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NOTES

- 1 A. N. L. Munby, 'The distribution of the first edition of Newton's *Principia*', *Notes Rec. R. Soc. Lond.* **10**, 28–39 (1952).
- 2 Freeman Dyson recalls Keynes telling a group of Cambridge students that Lymington actually sold the Portsmouth Papers to raise money for the British Union of Fascists. Although Lymington was deeply involved in British reactionary circles, this is not the justification provided in Spargo's authoritative account of the sale. See Freeman Dyson, 'A new Newton', *N.Y. Rev. Books* **50** (11), 4 (2003); P. E. Spargo, 'Sotheby's, Keynes and Yahuda: the 1936 sale of Newton's manuscripts', in *The investigation of difficult things: essays on Newton and the history of the exact sciences* (ed. P. M. Harman and Alan Shapiro), pp. 115–134 (Cambridge University Press, 1992).
- 3 See Spargo, *op. cit.* (note 2), for details on Keynes's efforts to put together his collection of Newton manuscripts after the Sotheby auction.
- 4 Sir Arthur Eddington, 'The greatest of all scientists: riddle of Sir Isaac Newton', JMK-67-PP-60/120.
- 5 Douglas McKie, 'Newton and chemistry', *Endeavour* **1**, 141–144 (1942); JMK-67-PP-60/143–145.
- 6 Keynes to Gilbert, 5 September 1937, JMK-67-PP-60/9–10.
- 7 Programme of the Anniversary Meeting of the Royal Society on 30 November 1942, JMK-67-PP-60/160–161.
- 8 J. N. Howard, *The Rayleigh Archives dedication* (Special Report no. 63) (Air Force Cambridge Research Laboratories, Cambridge, MA, 1967).
- 9 See, for example, R.J.N. [R. J. Northcott], 'Newton Tercentenary Celebrations', *J. R. Astron. Soc. Can.* **37**, 29–31 (1943).
- 10 A summary of Keynes's speech is found in the Keynes papers at the Newton Project, JMK-67-PP-60/181–182. This was prepared by Sir John Russell for the Society's records and approved by Keynes. Russell's summary is very similar to the points highlighted by the correspondence with Hartley.
- 11 Hartley to Keynes, 1 December 1942, JMK-67-PP-60/168–169.
- 12 Harold Hartley, 'Michael Faraday and the theory of electrolytic conduction', in *British Association for the Advancement of Sciences Centenary Meeting, London*, pp. 3–21 (BAAS, 1931). Keynes's copy of the address from JMK-67-PP-00/171–173d-v.
- 13 John Maynard Keynes, 'Newton, the Man', in *Essays in biography*, pp. 363–374 (Palgrave Macmillan, Basingstoke, 2010). The essay does not appear in the first edition of the book, which was published in 1933.
- 14 *Ibid.*
- 15 Keynes to Broad, 19 December 1942, JMK-67-PP-60/186.
- 16 Dyson, *op. cit.* (note 2).
- 17 Keynes to Lord Catto, and others, 9 October 1942, on 'The problem of our dollar balances', in *The collected writings of John Maynard Keynes* (ed. Donald Moggridge), vol. 23, pp. 262–264 (Cambridge University Press, 1979).
- 18 The Soviet celebrations occurred in 1943 because of differences in the Russian calendar.

- 19 Keynes to Hill, 10 February 1943, JMK-67-PP-61/28–31.
- 20 Lymington to Keynes, 8 September 1936, JMK-67-PP-60/19.
- 21 Keynes to Hill, 31 March 1943, JMK-67-PP-61; King’s College, Cambridge, transcription at the Newton Project, <http://www.newtonproject.sussex.ac.uk/texts/images.php?id=OTHE00072&page=38>. The question of the proper transliteration of Russian words was an important topic of discussion at this time, with many scientists expecting continued cooperation between Soviet scientists and the West after the war. See, for example, the extensive exchange of letters to the Editor in the pages of *Science* throughout 1943 and 1944.
- 22 Keynes to Hill, 10 February 1943, JMK-67-PP-61/38–39.
- 23 Hill to Keynes, 16 February 1943, JMK-67-PP-61/32.
- 24 Bernard Katz, ‘Archibald Vivian Hill, 26 September 1886 – 3 June 1977’, *Biogr. Mem. Fell. R. Soc.* **24**, 69–149 (1978), at p. 115.
- 25 William Van der Kloot, ‘Mirrors and smoke: A. V. Hill, his Brigands, and the science of anti-aircraft gunnery in World War I’, *Notes Rec. R. Soc.* **65**, 393–410 (2011). Van der Kloot writes, regarding a 1916 letter from Horace Darwin to Hill, that ‘The writer knew better than to address him by his Christian names, Archibald Vivian, which Hill detested and banned whenever possible’ (p. 393). In 1943 Keynes, of course, would have known as well as Darwin that Hill detested the name ‘Vivian’. The salutation is one of many examples of Keynes’s impishness.
- 26 Hill, *op. cit.* (note 23).
- 27 Keynes to Hill, 19 February 1943, JMK-67-PP-61/33–34.
- 28 *Ibid.*
- 29 Hill to Keynes, 26 February 1943, JMK-67-PP-61/35–36.
- 30 Minutes of a meeting of the Officers’ Committee, 4 March 1943. Royal Society Archive OM/2/5/36.
- 31 Hill, *op. cit.* (note 29).
- 32 Katz, *op. cit.* (note 24), p. 86.
- 33 Keynes to Hill, 2 March 1943, JMK-67-PP-61/37.
- 34 Minutes, *op. cit.* (note 30).
- 35 Keynes, *op. cit.* (note 33).
- 36 Minutes, *op. cit.* (note 30).
- 37 Henry Dale, ‘Address of the President Sir Henry Dale, G.B.E., at the Anniversary Meeting, 30 November 1943’, *Proc. R. Soc. Lond. A* **182**, 217–243 (1944).
- 38 A. G. Vaganov, ‘Kazanskaya Nyutoniana’, *Nauchnyi Tatarstan* **2** (2), 6–13 (2010).
- 39 Alexei Kojevniiov, ‘President of Stalin’s Academy: the mask and responsibility of Sergei Vavilov’, *Isis* **87**, 18–50 (1996).
- 40 Sergei Vavilov’s high position in Soviet science was a source of incredible tension after 1943, when Sergei’s brother, Nikolai, was murdered by Stalin’s regime for openly contradicting Lysenko’s biological work.
- 41 S. I. Vavilov, *Soviet science: thirty years* (Marxist International Archive, 1948 [2008]). See <http://www.marxists.org/archive/vavilov/1948/30-years/x01.htm>.
- 42 Newton’s anti-Trinitarianism was glossed over by Hessen, who treated his subject as a conventional product of the religious views of his time. This may be attributable to the fact that although the alchemical and theological material of Newton was not completely unknown, it was not a facet of his life that was widely remarked on until after the Sotheby sale of 1936.
- 43 Vavilov did not disagree with this point, and even remarked on the bourgeois roots of modern science, but he did not present Newton as a man of his age as Keynes or Hessen did, nor did he take the (apparent) internal contradictions of Newton the man as the centrepiece of his biographical material. Newton was a rationalist without a social context for Vavilov, whereas for Keynes and Hessen the social context and the internal contradictions (in Keynes’s case, the irrationalism) of Newton were paramount.
- 44 I owe this insight to Dr J. T. Young.

- 45 In *Materialism and empiriocriticism* (1909), Lenin writes: ‘The philosophy of the scientist Mach is to science what the kiss of the Christian Judas was to Christ. Mach likewise betrays science into the hands of fideism by virtually deserting to the camp of philosophical idealism. Mach’s renunciation of natural-scientific materialism is a reactionary phenomenon in every respect.’ (From an English translation in *Lenin: collected works* (tr. Abraham Fineberg), vol. 14, pp. 17–362 (Progress Publishers, Moscow, 1972).)
- 46 Loren R. Graham, ‘The socio-political roots of Boris Hessen: Soviet Marxism and the history of science’, *Social Stud. Sci.* **15**, 705–722 (1985).
- 47 Keynes to Hill, 31 March 1943, JMK-67-PP-61/38–39.
- 48 In Keynes’s letter to Hill of 31 March he notes that the price seemed high to him, but that it was a valuable collection and an ‘American Library would probably gladly pay this, or twice as much, so one cannot complain’. Ironically, although Keynes praised the Pilgrim’s Trust for deciding to purchase it, the Trust was itself founded and endowed by a wealthy American, Edward Harkness.
- 49 Hill to Keynes, 9 April 1943, JMK-67-PP-61/41–44.
- 50 Keynes to Hill, 13 April 1943, JMK-67-PP-61/45.
- 51 Keynes to Macmillan, 13 April 1943, JMK-67-PP-61/46–47.
- 52 Monk Ray, *Ludwig Wittgenstein: the duty of genius* (Penguin Books, New York, NY, 1991), p. 255.
- 53 Keynes to Jones, 27 April 1943, JMK-67-PP-61/49–50.
- 54 See the open letter from the administrators of the Pilgrim’s Trust to G. M. Trevelyan, the Master of Trinity College, dated 30 October 1943, JMK-67-PP-61/58–61.