The early Fellows of the Royal Society received letters, papers and printed books written in several European vernaculars. In many cases a translation was needed to make these texts accessible. Translators, though, had to negotiate the Society’s corporate views on language and prose style, and also prevailing contemporary theories of literary translation set out by popular poets such as John Dryden and Abraham Cowley. This article examines the translation practices of early Fellows of the Royal Society, showing that translations formed part of a set of knowledge-making processes at meetings. It also discusses the statements about translation theory found in the prefaces to printed volumes produced by or for Royal Society Fellows, arguing that although translators were aware of the requirement for a faithful translation, in fact they often modified their source texts to make them more useful for an English audience.

Keywords: translation; literature; Royal Society; publishing

Dr Hook read a farther Discourse, concerning the Tower of Babell giving his own opinion of the magnitude, and structure thereof[:]; he also gave a translation of a Letter of Pietro de la Valle, describing the Ruines of the said Tower[:]; he produced likewise a figure thereof according as he conceived it to have been, shewing the proportion and symmetrie thereof, which was contrived to deceive the Eye, and make it appear vastly higher, than really it was.¹

The Tower of Babel itself may have been nothing but a piece of architectural trickery, but the consequences of divine wrath at its construction presented a continuing challenge for the early Fellows of the Royal Society on both an intellectual and a practical level. They sought to overcome the confusion of tongues through schemes to promote a universal language; but in its absence the only way they could usefully engage with many foreign texts was through translation. This article explores the theories and practices that the Royal Society and its Fellows used in translating philosophical texts in the period from 1660 to around 1700.² I begin by situating the act of translation in the context of the early Royal Society’s theories about language and discourse, and contemporary theories of literary translation. I then turn to the Royal Society’s practices as reconstructed from *felicity.henderson@royalsociety.org

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institutional archives and printed translations. As Hooke’s lecture on the Tower of Babel demonstrates, translations were bound up with other knowledge-making practices, in this case oral and graphical. Finally, I show that philosophical translators used methods that were perfectly compatible with contemporary literary theories of translation, and argue that understanding translation is a vital part of understanding the rhetorical practices of the early-modern scientific community.

**NULLIUS IN VERBA? THE EARLY ROYAL SOCIETY AND LANGUAGE**

Despite the early Royal Society’s rejection of textual authority, the institution and its Fellows were still very much engaged with the written word. For writers and translators this meant negotiating a series of theoretical standpoints and practical demands that were interconnected but differently focused. A good deal of scholarly attention has been paid to some of these concerns, less to others. My aim here is simply to enumerate the various ways in which the Society as an institution may have exerted an influence on writers associated with it, and on translators in particular. As generations of commentators have found, it is very difficult to point to instances where this influence has clearly had an impact on Fellows’ prose, and translation is no exception. However, because in some ways the demands of the Society conflicted with those of literary translators discussed in the next section, it is worth keeping them in mind.

As in other matters, the Society’s model on questions of language was Francis Bacon. Bacon pointed to language as one of the main stumbling-blocks to a better knowledge of the world—his ‘Idol of the Market’. Words were slippery and definitions relied on other words, so that no one could ever be sure that he had understood what was meant. For the Royal Society, this anxiety manifested itself in various ways. It spawned the movement to create a universal language built on philosophical principles, which would link words with things more securely and facilitate communication between people of different nations. This strand of activity reached its apogee in John Wilkins’s *An essay towards a real character, and a philosophical language* (London, 1668), in which Wilkins drew up tables of ‘things and notions’ showing their philosophical relationship with each other. These tables were based on the understanding that all people had a common ‘Notion or mental image’ of natural things—it was merely languages that assigned arbitrary words to signify them. If people could agree on a single way of expressing these universal notions then the world would be ‘freed from that Curse in the Confusion of Tongues, with all the unhappy consequences of it’.

The language-planners thus envisaged a radical reformation of language as a solution to Bacon’s problem; however, the Society also made some attempts towards a less wholesale change by instituting a ‘committee for improving the English language’. The committee was short-lived and there is little evidence of meetings taking place, but a letter from John Evelyn to the convenor Sir Peter Wyche outlined Evelyn’s views on the necessary reforms. Foreign influences, including translations, figure strongly in Evelyn’s list of reasons for additions to and corruptions of the English language. A (suitably Baconian) step towards a solution, he suggested, would be the compilation of an English lexicon, so that words could be assessed and approved (or rejected). Included in the lexicon, along with other categories of words, should be ‘things difficult to be translated or express’d, and such as are... inco’mensurable one to another’, such as weights and measures, coins,
food and drink. Thus Evelyn, himself a veteran translator, drew attention to those aspects of language not covered by Wilkins’s ‘common notions’—the language of everyday life rather than of philosophy. Choosing a word in the context of Wilkins’s philosophical language meant making a statement about the place of the named thing in the system of the world. In Evelyn’s conception, word choice was linked to concerns about the purity of the vernacular and the extent to which foreign concepts could be naturalized into English.

Evelyn also recommended that a body of approved writing be established, for other writers to emulate. This would include texts ‘well translated out of the best orators & poets’, and the ‘public writings’ of Royal Society Fellows, in the hope that other writers might look to the Fellows as ‘judges and approbators’. Another statement on style appears in a famous passage in Thomas Sprat’s *The History of the Royal Society of London* (London, 1667), in which Sprat claimed the Fellows had resolved to reject all the amplifications, digressions, and swellings of style: to return back to the primitive purity, and shortness, when men deliver’d so many things, almost in an equal number of words. They have exacted from all their members, a close, naked, natural way of speaking; positive expressions; clear senses; a native easiness: bringing all things as near the Mathematical plainness, as they can: and preferring the language of Artizans, Countrymen, and Merchants, before that, of Wits, or Scholars.

This passage has been the source of much discussion about the influence of the Royal Society on Restoration prose style, and whether or not the Fellows lived up to their own ideals in respect of delivering so many things in an equal number of words. Probably too much emphasis has been placed on this passage as a statement of intent—after all, it was delivered in the course of a volume partly written to defend the Society against the ‘Wits and Railleurs’ who by making experimental philosophy ridiculous could do it more damage than any of its other adversaries. In rejecting the language of wits and scholars, the Fellows were merely rejecting the methods of two main tribes of opponents to the new philosophy; and in preferring the language of artisans, countrymen and merchants they were consistent with the utilitarian aims that were much emphasized by Sprat. Nevertheless, the passage agrees with other statements made by the Society and its Fellows advocating brevity and clarity, and regardless of whether or not all the Fellows immediately reformed their prose style, writers associated with the Society would have been aware of these concerns.

Sprat’s comments were made in the context of his description of the Society’s experimental programme, and were framed very clearly as prescriptions about speech at meetings, although they may also be taken to refer to written style. The relationship between speech and text at the early Royal Society was complex and has not been fully investigated by scholars interested in the way ideas were formulated, circulated, modified, endorsed and published in the early-modern scientific community. Texts intended for oral presentation at meetings must have been composed with this forum in mind, with the expectation that they might be revised for further use, whether copied into the Society’s registers, extracted in *Philosophical Transactions*, or printed in full elsewhere. Fellows would have been aware that written texts were only part of a set of knowledge-making practices shared at meetings (including experimentation, discussion, and presentation of images and artefacts) and that in this context the written word did not necessarily have the primacy that it might elsewhere.
As an institution, though, the Society did have a role in authorizing texts. The Council could license texts for printing, and the Society had engaged its own official printers to ensure their fidelity to the Society’s agenda. Theoretically, the Society’s imprimatur guaranteed the standard of a printed work. Historians have also argued that a new kind of textual authority arose in the context of the early Royal Society, based on the notion that the text was a transparent description of authorial experience that allowed the reader to ‘witness’ this experience as though he or she had been present with the author. This required a certain form of writing that emphasized the role of a single observing author, and provided circumstantial details to give the fullest possible picture of the experimental or observational experience.

Thus the choice of language, style and literary form all had implications for writers in an early Royal Society setting. This article concentrates on the theory and institutional practices of translation rather than giving detailed readings of specific translations, but it is clear that some of the concerns outlined here may have had an impact on translators, or at least those who were most closely allied with the Society’s business. The fundamental question of whether foreign things could be identified by using English words, or whether it was better to import new words, had not been solved. The approved ‘plain’ style for philosophical texts in English may have been difficult to achieve when working with a verbose or ornamented original. Finally, it was not clear whether the authority conferred through constructing a text as ‘virtual witness’ could be retained in translation; for example, abundant circumstantial details may not have made sense to an English audience and their retention might merely have rendered the work more foreign. If this were not enough, matters were complicated further by contemporary poets, who had their own theories of translation.

**NEC VERBUM VERBO? THEORIES OF TRANSLATION IN EARLY-MODERN ENGLAND**

The Royal Society Fellows were not the only early-moderns to (mis)appropriate a Horatian tag for their own purposes. Throughout the seventeenth century, theorists of and commentators on translation referred to Horace’s ‘nec verbum verbo’ as an instruction to eschew word-for-word renderings in favour of a text that captured the spirit of the original. The latter part of the seventeenth century was a boom period for literary translation of classical texts, with the poet and playwright John Dryden as the most eminent practitioner and most prolific theorist of translation. How might the questions of translation style and faithfulness to the original explored by Dryden and others have influenced the practices of non-literary translators? To answer this question I will begin by discussing the comments on translation made by four poets associated with the Royal Society: Sir John Denham, Abraham Cowley, Dryden and Sir Edward Sherburne.

The friends and Royalist poets Sir John Denham (1615–69) and Abraham Cowley (1618–67), writing in the 1650s, advocated a new, looser style of translation than had previously been practised. Denham described the new style in a poem praising Sir Richard Fanshawe for his translation of Giovanni Battista Guarini’s *Pastor fido*:

That servile path thou nobly dost decline  
Of tracing word by word, and line by line.  
Those are the labour’d births of slavish brains,  
Not the effects of Poetry, but pains;
Cheap vulgar arts, whose narrowness affords
No flight for thoughts, but poorly sticks at words.
A new and nobler way thou dost pursue
To make Translations and Translators too.
They but preserve the Ashes, thou the Flame,
True to his sense, but truer to his fame.20

This ‘new and nobler way’ of translation must be done by poets, who are able to give
flight to their thoughts rather than sticking to the words of the original author and can
retain the sense of the original while at the same time preserving the poetical reputation
of its author. A translation must also preserve the spirit of the original, or infuse a new
spirit into the text. In his preface to The Destruction of Troy (a paraphrase of a section of
Vergil’s Aeneid), Denham wrote:

I conceive it a vulgar error in translating Poets, to affect being Fidus Interpres; let that care
be with them who deal in matters of Fact, or matters of Faith: but whosoever aims at it in
Poetry . . . shall never perform what he attempts; for it is not his business alone to translate
Language into Language, but Poesie into Poesie; and Poesie is of so subtle a spirit, that in
pouring out of one Language into another, it will all evaporate; and if a new spirit be not
added in the transfusion, there will remain nothing but a Caput mortuum.21

Appropriately, Denham used an alchemical metaphor for the procedure of translation:
successful alchemy required something more than the ‘pains’ of ‘cheap vulgar arts’: it
required a spiritual purity that enabled mastery. Likewise, the linguistic skills that any
vulgar grammarian could acquire were not enough to achieve poetry—something of the
translating poet’s spirit had to be infused into the language. Denham specifically excluded
translators of ‘matters of Fact’ or scripture from his argument here, although the
implication is that the ‘care’ involved in this kind of work made it an inferior undertaking.

Abraham Cowley, in the preface to his Pindarique Odes (London, 1656) went even
further than Denham in advocating a free translation. He excused this with the argument
that Pindar was a notoriously difficult poet even in the original, and that a close
translation would be incomprehensible to an English audience (‘it would be thought that
one Mad man had translated another’). Indeed, Cowley claimed not to care whether his
texts were thought of as translations or interpretations, such was the latitude he allowed
himself in representing Pindar in English clothing. He wrote, ‘I have in these two Odes of
Pindar, taken, left out, and added what I please; nor make it so much my aim to let the
Reader know precisely what he spoke, as what was his way and manner of speaking.’22 In
Cowley’s and Denham’s theories, the translator-poet was not only licensed but also
positively encouraged to interfere with his text—enlarging or cutting, changing names,
locations and allusions to suit the contemporary English situation. The basis for this
freedom, though, was the genius of the translator, whose creative spirit, in theory,
matched that of the original author and mingled with it in the resulting new text.

Writing in 1680, John Dryden (1631–1700) cited Denham and Cowley in his own work
but ultimately advocated a middle road between what he termed ‘metaphrase’ (‘word by
word’ translation) and imitation. He was equally critical of both extremes. Returning to
Horace’s caution against too faithful a translation, he wrote: ‘Too faithfully is indeed
pedantically; ‘tis a faith like that which proceeds from superstition, blind and zealous.’ Of
the too liberal translation he pointed out that the reader ‘who is inquisitive to know an
author’s thoughts will be disappointed in his expectation.’ Instead he argued that the
‘sense of an author... is to be sacred and inviolable’; that the translator had no right to make changes even if they would alter the text for the better, just as a portrait painter could not deviate from his original. 23 Finally, Sir Edward Sherburne (1616–1702) moved even further from Cowley and Denham. He addressed his ‘Brief Discourse concerning Translation’, published in 1702 with his translations of Seneca’s *Tragedies*, to those of his readers who were ‘Enemies to all Translations that keep close and near to their Originals’. He argued that this attitude sprang from a mistaken interpretation of Horace, and that in fact Horace specifically required ‘a faithful Interpreter’ to translate word for word. His own translation of Seneca, he says, was

not curtail’d or diminish’d by a partial Version, nor lengthened out or augmented by a preposterous Paraphrase; but the genuine Sense of Seneca in these Tragedies intelligibly delivered, by a close Adherence to his Words as far as the Propriety of Language may fairly admit... in a word, rendering him entire, and like.24

What were early-modern English philosophical translators to make of these literary theories of translation? The highly literate, cultured gentlemen of the Royal Society would certainly have been aware of some, if not all, of the writers mentioned above. Apart from being prominent poets, Denham, Cowley, Dryden and Sherburne were all associated with the early Royal Society. Denham, Cowley and Dryden were Fellows, although it is unlikely that they took any part in the research programme of the Society.25 Cowley was most obviously interested in the new philosophy, although his active support was probably restricted to penning the commendatory poem ‘To the Royal Society’ that was printed at the beginning of Sprat’s *History*. Sherburne’s association came through his publication of *The sphere of Marcus Manilius* (London, 1675), a translation of the first book of the Roman poet Manilius’s astronomical and astrological verse treatise, *Astronomica*. Sherburne’s version was of interest to the new philosophers partly for the appended ‘Catalogue of the most Eminent Astronomers’ compiled by Sherburne, which began with Adam and continued to the present day. Robert Hooke and Henry Oldenburg both assisted Sherburne in preparing his book, and *Sphere* was given a favourable review in *Philosophical Transactions* when it appeared.26

Translators of ‘matters of fact’ thus had several literary models available to them. Denham’s metaphor of translation as alchemical transformation contrasts with Dryden’s portrait analogy and with Sherburne’s suggestion that he had represented Seneca entire, ‘as in a glass’—that is, even more true to life than a painting. Quite apart from the differing levels of faithfulness to the original text, these metaphors invoke very different roles for the translator: Denham’s translator is a magus figure, controlling and creating; Sherburne’s is something like a mechanical operator, holding up a mirror as a device through which his readers could see the original text. Although it may seem more appropriate for natural philosophers to choose the second route, an analysis of their translations and their writings about translation suggests that they were just as manipulative of texts and language as any other writers.

**FAITHFUL INTERPRETERS?** **TRANSLATION IN PRACTICE AT THE EARLY ROYAL SOCIETY**

As we have seen, the Royal Society’s interest in language was not merely philosophical but also practical: the Fellows produced and consumed vast quantities of written material. And,
despite the nationalistic rhetoric of Sprat’s *History*, some of these texts originated with or were intended for non-English speakers, and thus required translating. The second half of this article presents an overview of the translating practices of the Society and its Fellows. Some of this activity was corporate, on the Society’s behalf, and some was much more private, the concern of a single Fellow or of a small group.

Historians are extremely lucky that the early Fellows kept such good records of their activities, and it is from their archives that I draw my initial material here. There are six main series of records from the period 1660 to 1730: the Journal Books and Council Minutes (minutes of ordinary and council meetings), Register Books (fair copies of papers read at meetings), Letter Books (fair copies of letters received), Classified Papers (original papers) and Early Letters (original letters received). I begin by discussing which languages appear in the archives, how regularly, and whether or not it was found necessary to translate material from those languages into English. Taking papers first, the catalogue lists 1690 individual texts copied into the 21 volumes of the Register Book series (1660–1738), and 2507 items gathered into the Classified Papers series. Of those in the Register Books, 231 items (14%) have been transcribed in Latin, 28 (2%) in French, and 10 partly or wholly in Italian, with the remainder appearing in English. In the Classified Papers, we find 342 papers (14%) in Latin, 106 (4%) wholly or partly in French, 21 in Italian, 14 in German, 8 in Dutch, and 1 each in Spanish, Portuguese, Swedish, Chinese and Arabic. Turning to the Early Letters series, of the approximately 4090 items we find that 910 (22%) are written in Latin, 606 (15%) in French, 194 (5%) in Dutch, 40 (1%) in Italian, 10 in German, 2 in Spanish and 1 in Portuguese.

What does this reveal? It is no surprise that the main language other than English was Latin and that almost a quarter of the early correspondence was conducted in Latin. Equally it is unsurprising that French was the most frequent European vernacular. The figures for both these languages include draft replies from Henry Oldenburg. The unexpectedly high number of letters written in Dutch is the result of the voluminous correspondence of Dutch microscopist Antoni van Leeuwenhoek, who was not able to write in any other language. Some of the texts written in less common languages such as Swedish and Chinese were sent to the Society for their intrinsic interest, rather than because no other language was available for communication. For example, the single Swedish text is a printed document about the 1728 charter of the Royal Academy at Uppsala, and the Chinese text is a chronological table of Chinese history printed at Canton in 1724.

These letters and papers were for the most part sent to the Society by their authors, or by an intermediary, with the intention that they should be read and discussed at meetings. The Society was thus under some obligation to do this in a way that would allow most Fellows access to the discussion; in some cases this meant they had no choice but to provide a translation. This is most striking in the case of van Leeuwenhoek’s correspondence, which was never read in its original Dutch and presented a considerable challenge to the Fellows in terms of providing an adequate translation. The requirement for a translation would have been similar for most other European vernaculars. Where Latin and French are concerned, however, practices seem to have varied over time and according to the Fellows involved. In the early years of the Society, French letters and papers produced at meetings were often read in their original language, but were then ordered to be translated and ‘registered’ (that is, copied into the Register Book). This implies that French was acceptable for the oral atmosphere of the meeting, but it was preferable that the written copy for posterity was an English translation. In 1666 a committee was appointed to
consider some papers on coloration produced by Sir Theodore de Vaux, ‘and to cause them to be translated into English from the French, that so they might be the better digested afterwards.’ Digestion here suggests not just making a translation for the purpose of entering a fair copy into the Register but also active use of the particulars contained in the papers; indeed, dyeing was a topic to which the Fellows returned intermittently.

During the same period, other French texts were ordered to be translated before being read, which would normally happen at a subsequent meeting. In 1662, for example, ‘the amanuensis was ordered to translate into English, from the French, Monsieur Huygens’s letter to Sir Robert Moray . . . and to bring the said translation to the next meeting’; this duly occurred, and the letter was read ‘and ordered to be filed up’. It is not clear whether there was any rationale for ordering a translation to be made before or after reading the text at a meeting, and it may have been influenced by practicalities such as press of business, or the composition of those attending a particular meeting.

There is never any mention of translating Latin in the minutes of the meetings, suggesting that Fellows felt that Latin texts stood in no need of translation for the purposes of reading at meetings, or registering in fair copies. Indeed, when a Portuguese manuscript of medical receipts was presented to the Society, the secretary was asked to have it translated into Latin or English. Again, though, there is a difference between what happened at meetings and further iterations of the texts, this time in the context of Philosophical Transactions. Oldenburg began printing the journal in 1665, but it was not until the fourth year that he began printing articles in Latin. Oldenburg’s prefacing of Latin letters in Philosophical Transactions with comments such as ‘This . . . we shall give the Reader in the same Language and Words, in which the Author of it desired, it might be inserted in this Tract’ explains the impetus for his changed stance on Latin (allowing particular Fellows to carry on controversies with continental philosophers), but also suggests an unwillingness on his part to move away from his original intention of presenting the business of the Society for a wider English audience. At the same time he was aware of the need for an authorized Latin translation for the benefit of continental audiences, who were not generally able to read English. As an aside, it is interesting to note that of the 231 texts copied into the Register Books in Latin, 60 occur in the years 1660–1700, and the remaining 171 in the years 1700–40, a shift that perhaps mirrors the Society’s move away from the Baconian ‘useful philosophy’ of its earlier days, towards a greater emphasis on continental correspondence.

The translation of letters and papers sent to the Society was in some sense obligatory, but beyond this there was a steady stream of translation of other material, mainly printed books, mentioned at meetings of the Society. The minutes provide interesting insights into the context in which these translations took place, and the uses to which resulting texts were put. At a meeting in February 1664, Thomas Henshaw read his translation of material from Francesco Stelluti’s Italian tract on fossilized wood, a copy of which he also presented as a gift from Sir Robert Paston FRS. The Society was intermittently interested in lignum fossile, as minutes of the meetings show. This particular episode had begun back in May 1663. After a long discussion of the formation of minerals and metals, and petrifaction, Robert Hooke was asked to inspect a specimen of petrified wood provided by Dr Jonathan Goddard. He presented his observations the following month. Then in December, Dr George Ent produced a table made of lignum fossile, which had been manufactured in Italy. The Fellows requested that further tests on the material be made, this time involving chemical analysis as well as microscopic observation. It was
at this meeting that Henshaw was ‘desired to produce his book, that treats of the lignum fossile, or to give an extract of what is there discoursed of.’ Stelluti, a key early member of the Italian Accademia dei Lincei, had published his observations in Rome in 1637 and the tract would have been a rare volume in London 30 years later. Henshaw’s translation included Stelluti’s explanations of the fine illustrations following the short treatise, suggesting that the images, which included 11 pages of illustrations of fossilized wood and shells (see figure 1 for an example) would have been displayed at the meeting. Henshaw also introduced one of the translators’ neologisms bemoaned by Evelyn: ‘Cretiligneous’ for a substance that seemed to be composed of both ‘loame and wood’. Although the work was obviously deemed relevant to the ongoing investigation, the minutes of the meeting do not record any further discussion of Henshaw’s text. On this occasion, translation was just one of several investigative methods brought to bear on the problem of lignum fossile. Along with the observations and anecdotes of various Fellows, the material samples produced by Goddard and Ent, Hooke’s microscopic observations, and Robert Boyle’s chemical analysis, Henshaw provided a further source in terms of the tract itself with its accompanying images, and the linguistic skill to unlock it.

Other translations were requested in a similar way at meetings, but with mixed results. So, for example, in May 1662 ‘Mr Haak was desired to translate an Italian treatise of dying’, and in September the same year Sir Gilbert Talbot, Christopher Merret and Henshaw were asked to assist Haak with the task. This was the important treatise Plictho de l’arte tentori by Giovanni Ventura Roseto, first published in Venice in 1540 but reprinted several times in its original Italian (in 1548, 1565, 1611 and 1672). Despite the involvement of Talbot, who had spent 11 years attached to the English Embassy at Venice, and Christopher Merret, who had translated Antonio Neri’s L’arte vetraria (Firenze, 1612) in 1662, there is no evidence of any progress being made. Similarly, in July 1667 the conversation turned to mines, and the formation of crystals. Lord Brereton mentioned that ‘Merian’s book concerning the Alpes, written in High Dutch’ contained a description of ‘a river, wherein is a matter like ice, which continually congeals into crystal’. This was one of the first printed descriptions of Alpine glaciers, and because the book contained ‘many other subjects worth notice, Mr Haak was desired to translate this book of Merian into English for the use of the Society, which he promised to do.’ However, at the following meeting, Mr Haak being put in mind of his late undertaking to translate Mr Merian’s book on the Alpes out of the High Dutch into English, reported, that he had a son-in-law now dwelling in that country, from whom he could procure a more exact description of Gloss Bletchia, and other remarkable things there, than he thought that book might afford; and he promised to write for an account as soon as he could. Perhaps Haak felt he had better things to do than translate a German travel-account for the Society, but it seems more likely that the eye-witness account of a known correspondent would be preferred over the printed description, and the translation of Merian was never accomplished.

These are just a very few examples of the ways in which translations were incorporated into meetings of the early Society, but they point to some wider considerations. There is a strong emphasis here on utility and topicality: the translations were prepared, or requested, to support current investigations. No doubt this had an impact on the nature of the translation produced—or not produced, in the case of the enquiries about glaciers, for which it was deemed more useful to send a specific query to a known individual. The
Figure 1. Francesco Stelluti, *Trattato del legno fossile minerale nouamente scoperto* (Rome, 1637), plate 10. Figure D shows a sample with a stone core and an outer section of bark. (Copyright © The Royal Society.) (Online version in colour.)
presence among the Fellowship of those skilled in foreign languages was an asset to the Fellows, as was knowledge of foreign books and their availability in London via networks of gentlemen-collectors. The ability to call on men with these types of expertise was a strength of the early Royal Society that can be overlooked if we judge involvement merely by experimental activity.

What the minutes of the meetings do not illuminate is the theory that underpinned the Fellows’, or the Society’s, translating activities. Overt statements theorizing non-literary translation are rare, but some hints can be found in the prefatory material signalling the translator’s intentions for the volume, or the translator’s prefaces to printed translations. The most common topics discussed were the translator’s reasons for choosing to present this particular text in English, assurances about the authority of the original and/or the translation, comments broadly relating to translation method, and notification of changes to the original (whether deletions or additions). Less frequently, translators discussed illustrations, intended audience, and technical details such as how foreign measurements have been converted into English ones.

As might be expected, translators gave several reasons for presenting particular volumes in English. Scarcity of the original work was cited regularly, often linked with expense. In the preface to his translation of Claude Perrault’s Mémoires pour servir à l’histoire naturelle des animaux (Paris, 1671–76), Alexander Pitfeild explained that the original had been printed so ‘Magnificently’ and ‘Curiously’ that the volumes ‘seemed not to be designed for common Sale’ and were only available as presents from the French King or Academy ‘to Persons of the greatest Quality’: it was even difficult to see a copy of the book in Paris itself. This, he pointed out, rather defeated the purpose of the French Academy’s efforts, ‘most of the Learned being totally deprived of the singular Advantages that might be obtained therefrom’. Other volumes were equally scarce, although not by design. The booksellers Samuel Smith and Benjamin Walford (printers to the Royal Society) drew attention to their belief that the German edition of Leonhard Rauwolf’s Aigentliche beschreibung der Raiss . . . inn die Morgenländer, furnemlich Syriam, Judaeam, Arabiam, Mesopotamiam, Babyloniam, Assyriam, Aremienam, &c (Laugingen, 1582) was ‘only to be found in the Arundelian Library at Gresham College’, despite being ‘much desired’ by learned gentlemen more generally. It was for this reason that they ‘undertook the Charge of having it translated’ and printed in English. Henry Oldenburg, in his preface to the translation of Danish natural philosopher Nicolaus Steno’s De solido intra solidum naturaliter contento dissertationis prodromus (Florence, 1669), wrote that his printer had suggested the translation because ‘there being now very little or no commerce between the English Book-sellers, and those of Italy, the conveyance of this Book, (as it doth of others there Printed) into England would prove very tardy.’ If some copies did make their way to England, it was unlikely that there would be enough to satisfy demand from ‘all sorts of curious English-Men’, or even the subset who could read Latin.

Other translators stressed the benefits of making their text available to a wider audience, or more particularly to an English audience. Thus, Joseph Moxon pointed out that in translating Vignola’s Regola delli cinque ordini d’architettura (1562) into English he was merely doing what had already been done for other vernaculars. In the case of books about trades, mining or other undertakings, translators were keen to see English practitioners emulate or surpass foreign efforts. So Robert Boyle suggested that a translation of
Dutchman Lodewijk de Bils’s proposals for a new way of making anatomical preparations would not only encourage the proposer and gain English subscribers for his project, but might also provoke Englishmen to follow his lead and remain at the forefront of anatomical research. Boyle went further, suggesting that the example of the Dutch authorities’ show of support for de Bils might even encourage great men in England to support natural philosophy. The translation in question, orchestrated by Boyle and executed by John Pell, was printed in 1659, and Boyle’s comments were made in the dedicatory epistle to Samuel Hartlib. Both men were at the centre of efforts to promote the new philosophy in England, so these were topical issues.

As the foregoing quotations may have hinted, translators were usually keen to emphasize the authority of the original text or their own translation, or both. This was linked with the question of why particular texts had been chosen to translate: clearly only the most reputable of foreign authors should be naturalized into England. As might be expected in a Royal Society context, translators stressed the knowledge and experience of the original author, but in particular any personal connections between the author and Fellows of the Society. So for example, Peter Wyche explained to his dedicatee, the Secretary of State, Lord Arlington, that the Portuguese originals of his A short relation of the river Nile ‘were by Curious Sir Robert Southwell procured from an inquisitive and observing Jesuite at Lisbon, who had lived many years in Aethiopia and the Indies.’ As well as being a Fellow, Southwell was Envoy Extraordinary to Portugal and was well known to Arlington. The inquisitive Jesuit was Jerónimo Lobo; both Lobo and Southwell corresponded with Henry Oldenburg at the Society about Lobo’s work. John Sterpin, translator of Lucas Jacobsøn Debes’s Færoæ et Færoa reserata (Copenhagen, 1673), was also known to Henry Oldenburg, although under rather unfortunate circumstances: he had produced an unauthorized Latin translation of part of Philosophical Transactions, the text of which had proved to be extremely defective. In dedicating his translation to Thomas Henshaw, former Envoy Extraordinary to Denmark, Sterpin emphasized Henshaw’s connection with the original author: ‘the Authors person and Ingenuity being known unto you, it cannot but conciliate some authority to this Treatise; since you were beyond Sea, several times pleased to invite him, and discourse about the Contents of his Book.’ Perhaps unsurprisingly given the circumstances, Sterpin also played up his own relationship with Henshaw, whose ‘incitements’, he said, helped convince him to undertake the translation.

Statements such as these tie author, translator and readers into the same philosophical community and provide additional weight to the resulting text. The translation, in this case, is a link with practitioners of experimental learning across national boundaries. This can particularly be seen for translations of volumes originally produced under the auspices of foreign academies, or with their approval. Translators are careful to retain, and point out, these connections. So, for example, when John Beaumont FRS translated French physician Nicolas Venette’s L’art de tailler les arbres fruitiers (Paris, 1683), he prefaced his volume with ‘The Approbation of the Colledge-Royal of Physicians at Rochelle’ in English. He did not include any further prefatory material of his own (or even attach his name to the translation), which suggests that the French physicians’ approval was enough to launch the volume. In the 1680s Alexander Pitfeild and Richard Waller translated works originally published by the French Academié and the Accademia del Cimento, respectively, and both gave the foreign academies fulsome praise in their prefaces. Waller, in particular, emphasized the extent to which the Royal Society and the members of the Accademia (‘men of great ingenuity’, according to Waller) were
investigating similar phenomena using the same experimental procedures. In these cases the imprimatur of the foreign society extended not only to the individual volume (and, by implication, its subsequent translation) but also to the English Society’s philosophical endeavours more generally. Situating themselves at the forefront of a lively international community of philosophers was one of the Royal Society’s tactics to ward off criticism, and to do this more effectively they pointed to important foreign research at the same time as advertising their own contributions to useful knowledge. Oldenburg did this very clearly in his introduction to Nicolaus Steno’s geological work. As well as praising Steno, he cited Robert Boyle and Robert Hooke’s research on minerals and fossils as a complementary English undertaking, and concluded:

since ’tis apparent, that the Ingenious and Diligent almost every where are entring more and more into Philosophical Leagues, for the discovery of the Works of God and the Operations of Nature, we cannot but entertain pregnant hopes, that notwithstanding all the oppositions of Lazy and Envious Men, a good harvest of considerable and useful knowledge will be reaped in time…

In translating foreign works, Royal Society Fellows were not merely making the contents English, they were absorbing the fruits of foreign research into the English philosophical community—and at the same time making the authors English too, in that they were symbolically being included into the English Royal Society. In some cases this was not merely a virtual inclusion, but a real one: the Dutch microscopist Antoni van Leeuwenhoek was invited to become a Fellow after many of his letters had been translated by the Society and published in Philosophical Transactions.

Having explained why they had chosen to undertake a translation of a particular philosophical text, several translators turned to the question of how they had gone about their task. On the whole, those who discussed this question tended to agree with Pitfeild’s method in translating Perrault: ‘I have used my utmost endeavours for the rendering a faithful Translation thereof; still keeping as near as I could to the true sense of the French Coppy, and varying as little therefrom as the Nature of the English Language would permit.’ Christopher Merrett stated that he had initially translated Antonio Neri’s text ‘word for word’; Robert Boyle assured Hartlib that in translating from the French, he had been ‘more careful to do right to [the author’s] Words then to his Style’. This was to avoid ‘straining’ the original, so that Hartlib could be absolutely sure that the meaning conveyed was as the original author had intended. Other translators allowed themselves slightly more latitude, but their underlying intention of faithfulness to the original remained clear. Joseph Moxon claimed that he had followed Vignola’s words as ’neer’ as he could, ‘unless here and there I have been a little more large, thereby endeavouring the better to express his meaning’. Martin Lister explained that he had jettisoned the comments of Dutch painter and entomologist Johannes Goedaert’s previous translators (‘meere Rapsodies’, according to Lister) and had ‘Printed the Authors words only’—with a few additions of his own.

Despite their basic commitment to a faithful translation, though, most translators admitted to making some changes to their original texts. These ranged from apparently minor clarifications or insertions of extra text, to major revisions, additions or deletions. Moxon and Lister, in the examples cited above, claimed merely to have enlarged the original text with a more comprehensive explanation of the material, or with additional observations based on the translator’s experience. Christopher Merrett, despite his initial aim of
translating Antonio Neri ‘word for word’, decided this was undesirable, partly because of Neri’s tediously repetitive style but also ‘in a business, wherein so little hath been said’. Instead, he informed the reader that he had

\[\text{delivered whatsoever is material that I have met with in any good Author concerning whatsoever } Neri \text{ treats of, that thou might’st have together all that is substantially written upon this unusual subject, and have supplied some things defective in our Author, or very fit to be known to Curious persons.}\]

It seems that these translators felt more obliged to present as useful a text as possible to their readers than to preserve the original author’s words or intentions. A striking case of this was the translation of the Swiss mathematician Johann Heinrich Rahn’s *Teutsche algebra* (Zurich, 1659) by Thomas Brancker and John Pell. The English title of the translation, *An introduction to algebra, translated out of the High-Dutch into English, by Thomas Brancker M.A. Much altered and augmented by D[octor John] P[ell]*, alerted the reader to what was actually a wholesale revision with new text by Pell grafted on to Rahn’s original. Admittedly this was an unusual situation in that Rahn had studied under Pell in Zurich and so some of his material was based on Pell’s mathematical methods, but the resulting work stretched the limits of what might be called a translation.

Additional material was not always incorporated into a text. Often it came in a separate section—commonly a list of difficult words or trade terms, a table of contents, a commentary, or another text appended to the main one. Like the enlargements of Lister, Moxon and Merrett, these presented an opportunity for translators to add their own material into the work. Sir John Pettus created a ‘Dictionary’ of mining terms, which he printed as a second part of his translation of Lazarus Ercker’s metallurgical work *Beschreibung aller fùrnemisten mineralischen Erzti- und Berckwercksarten* (Prague, 1574). Printed with a separate title page, this was more a learned exposition than a simple dictionary, part philological and historical commentary, part discourse of Pettus’s ‘own Conceptions and Observations’ on mining and metallurgy. Henry Oldenburg added ‘The Heads of the Principal Contents’ of François Bernier’s *Histoire de la dernie`re révolution des états du Grand Mogol* to his English translation: the somewhat sensational nature of these ‘heads’ suggests he (or his publisher) may have seen this as a way to improve sales. Additions such as these could reposition a text or make it more suitable for its new intended audience. This was also the case with substantial deletions, such as those mentioned by Edward Tyson in his preface to Francis Lodwick’s translation of Jan Swammerdam’s *Ephemeri Vita* (Amsterdam, 1675). Swammerdam’s original octavo volume, wrote Tyson, extended to over 420 pages; its great length was necessitated by the author’s ‘frequent, Pious Meditations, and Poetry upon the various accidents of the Life, and extraordinary Mechanism of this Creature’. These ‘Contemplations’ were ‘for some reasons’ left out of the translation, ‘and we here only present you with the Philosophical part, the Natural History and Anatomy of this strange Fly.’ Presumably the main reason for leaving out the contemplations was their perceived irrelevance to what the Royal Society Fellows would have considered to be the interest of the volume. Despite their willingness to signal changes to the original text, though, translators were curiously uninformative about matters to do with the etiquette of such changes. In none of the examples under consideration did the translators state that they had permission for their translation, nor did they ever mention any enquiries to the original authors about their intended meaning. As Adrian Johns has shown, both these issues were extremely
Figure 2. Roland Fréart (tr. John Evelyn), *A parallel of the antient architecture with the modern* (London, 1664), p. 71: ‘Another Corinthian Profile exceedingly enrich’d and full of Ornament, taken from Dioclesian’s Baths at Rome’. (Copyright © The Royal Society.) (Online version in colour.)
important in the early-modern philosophical community for a range of reasons to do with priority and authority.68

Lodwick was not the only translator to grapple with stylistic concerns. Sterpin claimed that he was initially reluctant to attempt his translation from Debes’s Danish text because ‘the Northern plainness, if not inelegancy of its expressions would hardly, keeping to the sense, afford a Polished Stile in English’, and presenting a polished text was the only way an ‘Interpreter’ could hope for praise. John Evelyn also saw the style of the resulting translation as an integral, but problematic, part of the act of translating. In dedicating his translation of Roland Freart’s Parallèle de l’architecture antique et de la moderne (Paris, 1650) to Charles II, he drew attention to ‘the difficulty of rendering a Work of this nature intelligible to the vulgar, and not unworthy the Stile of a Gentleman’.69 Evelyn’s problem was of course not unique to translated texts: his own Sylva (London, 1664) had been criticized for its Latinate style, which some readers complained came at the expense of intelligibility. As Michael Hunter has pointed out, though, this may have made the book more attractive to the wealthy landed gentry and therefore contributed to its success.70 Clearly the question of style concerns the intended audience for these translated texts. Were they really part of the Royal Society’s drive to make useful knowledge more accessible to a wider group of readers—‘the vulgar’, as John Evelyn put it? In many ways
the physical volumes themselves speak louder than the prefaces in suggesting where they were aimed. They include a number of large-format publications, printed on good-quality paper with lavish illustrations. Evelyn’s edition of Freart was one such volume (see figure 2). Sir John Pettus’s translation of Lazarus Ercker was a fine folio, ‘illustrated with 44 Sculptures’ as the title-page proclaimed (see figure 3), a suitable format for the ‘Lords and Gentlemen’ who had subscribed to the volume. Lister explained that he could only afford to print 150 copies of Goedaert’s *Insects* because of the expensive engravings; thus the book was ‘intended only for the curious’. 71

**CONCLUSION**

The requirement for a faithful translation of early-modern philosophical texts was explicit: it was insisted upon by original authors, assumed by readers, and promised by translators. Mistakes and misinterpretations could be economically, socially and intellectually costly for the whole community of producers and consumers. Yet this did not necessarily lead to ‘word for word’ translations. There was of course a range of methods employed, and some translators did keep close to the text. Many, though, allowed themselves the same latitude that literary translators advocated—and took—when dealing with Greek and Latin authors. They incorporated new material, their own or gleaned from other authors; they provided commentaries, dictionaries and explanatory notes; they repackaged and reformatted texts, dividing them into sections and including new tables of contents; and they cut out unwanted parts of the originals. Like Denham, Cowley and the other literary translators, they did this to make their materials suitable for the contemporary English audience. They were clearly aware of the tension between the expectation of a literal translation and the fact of deviation from the original, because they discussed their emendations in their prefaces to the printed translations.

Where, then, did this leave the authority of the text? Like literary translators who argued that only poets could effectively decant the ‘spirit’ of their source text into a translation, philosophical translators took on some of the responsibility for the spirit of the text—in this case its authority rather than its literary merit. As with the translators of the great classical poets, only a writer who fully comprehended the original could perform a satisfactory translation. In philosophical texts this called for a translator who had the same expertise as the original author. Expertise could be established through experience, through having performed the same procedures or made the same observations as the original author, or by membership of the philosophical community (or in many cases both). As we have seen, many translators discussed their own, and the original author’s, expertise in the prefaces to their works. In this way the translated text had a dual authority, from both author and translator. Indeed, it was often the case that both voices were present in the work, and that the translator and original author were in conversation. This model also occurs to a certain extent in *Philosophical Transactions*, in which many articles (often received from non-Fellows) were ‘framed’, or introduced, by a Fellow or by the editor himself, just as though the author were being introduced into a meeting of the Society.

This introduction of foreign philosophical authors and their ideas into English was the starting point for all early-modern scientific translations. They could be occasional—that is, made in response to the demands of a particular set of current research questions—or
they could reflect a broader ongoing interest in the topic under discussion. In either case, translators sought to present a text that would meet the requirements of their readership for a clear exposition of matters of fact. In this way, they did keep faith—not necessarily with the letter of the original text, but with the community of English philosophers who read and used their works.

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NOTES


2 I use the word ‘philosophical’ here as an attempt to avoid the anachronistic use of ‘scientific’, and to avoid any suggestion that the subject matter of these books was limited to what we would today think of as scientific.


6 Wilkins, Essay, sig. a1′ and p. 20. For Wilkins and language-planning see Lewis, op. cit. (note 5).


8 Evelyn, op. cit. (note 7), vol. 3, pp. 309–312. For Evelyn as translator see Ben Thomas, ‘John Evelyn’s project of translation’, Art in Print 2, 28–34 (2012). The language-planners were of course aware that their schemes would not be suited to literary texts.
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14 For the Society’s publishing programme see Johns, *op. cit.* (note 3).
15 Although Rhodri Lewis has argued that this was a somewhat circular process, with the early Society also aiming to gain status from the books it authorized (‘The publication of John Wilkins’s Essay (1668): some contextual considerations’, *Notes Rec. R. Soc.* 56, 133–146 (2002); esp. pp. 134–135.
17 The great natural history volumes of the period such as those by John Ray and Francis Willughby were a step towards solving this problem.
18 The passage, in Horace’s *Ars poetica* (ll. 133–134), reads ‘nec verbum verbo curabis reddere fidus | interpres’ (‘nor as a faithful translator try to interpret word for word’).
27 The Classified Papers and Early Letters were organized into their current guard-books in 1741 by Thomas Birch FRS, secretary. Not all letters and papers were copied into the Register Books and Letter Books, but obviously there is still a large overlap between the texts in Register Books and Classified Papers, and Letter Books and Early Letters. For a detailed description of the

Unfortunately no comparable figures can yet be obtained for the Letter Books because they have not been catalogued at item level.

Royal Society Archives, Cl.P/17/47 (Swedish academy)—a partial translation (Cl.P/17/46) was read to the Society on 5 November 1730 (see JBO/14/512); Cl.P/16/55 (Chinese history)—see Phil. Trans. R. Soc. Lond. 36, 397 (1729).

On reading papers at meetings see Johns, ‘Reading and experiment’ (op. cit., note 3), pp. 251–253. The Classified Papers series in particular does contain some extra material that was never part of the Society’s business—for example, papers dating from the period before 1660, or some of Robert Hooke’s papers (discussed in Felicity Henderson, ‘Robert Hooke’s Archive’, Script and Print 33, 92–108 (2009)). This material represents a small fraction of the whole, and is largely written in English.


The first item to be registered in the original French is dated 1686 (RBO/6/119, ‘Account of great hail fallen in France’). It was read to the Society on 3 November 1686 (Birch, op. cit. (note 7), vol. 4, p. 500). Curiously, a different approach was taken with the Letter Books, into which Latin and French documents were copied in their original languages from the outset.

Birch, op. cit. (note 7), vol. 2, p. 93 (23 May 1666); see Cl.P/3i/27.

For example, William Cole’s work on murex; see Phil. Trans. R. Soc. Lond. 15, 1278–1286 (1685).

Birch, op. cit. (note 7), vol. 1, pp. 106 (20 August 1662) and 108 (3 September 1662).

Birch, op. cit. (note 7), vol. 2, p. 397 (21 October 1669); see MS/14.

In 1668 several Latin letters appeared (Phil. Trans. R. Soc. Lond. 3, 650–651, 654–655 and 732–735 (1668)). The first Latin article was ‘An exact narrative of an hermaphrodite now in London’ (Phil. Trans. R. Soc. Lond. 2, 624–625 (1666), and it was no doubt the subject matter that prompted Oldenburg to print in Latin rather than English on that occasion.


Francesco Stelluti, Trattato del legno fossile minerale nouamente scoperto (Roma, 1637); see also Cl.P/9i/13 for Henshaw’s translation. See also Sachiko Kusukawa, ‘Drawings of fossils by Robert Hooke and Richard Waller’, Notes Rec. R. Soc. 67, 123–138 (2013), http://dx.doi.org/10.1098/rsnr-2013-0013, note 16.


Dr Ent’s permission was requested for some shavings to be taken from the table (Birch, op. cit. (note 7), vol. 1, p. 347 (23 December 1663)).

The COPAC catalogue lists only five copies of the work in UK libraries, which suggests it would also have been scarce in the seventeenth century.

Cl.P/9i/13, f. 2v. The original reads ‘creta legno’ (‘clay-wood’), so ‘cretiligneous’ was indeed Henshaw’s coinage (it did not catch on). I thank Maria Romano for her assistance with translation from the Italian.


Merret’s translation of Neri’s work was published as The art of glass (London, 1662).
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46 Birch, *op. cit.* (note 7), vol. 2, pp. 185 (4 July 1667) and 187 (11 July 1667). The book was Matthaeus Merian (the elder), *Topographia Helvetiae, Rhaetiae et Valesiae* (Frankfurt, 1642).

47 See *Phil. Trans. R. Soc. Lond.* 4, 982–983 (1669): ‘Extract of a Letter, Written by Mr. Muraltus of Zurich, to M. Haak, a Fellow of the R. Society, concerning the Icy and Chrystallin Mountains of Helvetia, call’d the Gletscher. English’d out of Latin by the Publisher, as follows.’


50 ‘To the ingenious artist’, *Vignola, or the compleat architect* (London, 1655).

51 Robert Boyle, ‘To my much esteemed friend Samuel Hartlib the Elder, Esq.;’ *The copy of a certain large act . . . touching the skill of a better way of anatomy* (London, 1659), sigs A2′–5v.

52 Peter Wyche, *A short relation of the river Nile* (London, 1669), sig. a1′.


55 Lucas Jacobson Debes, *Faeroae & Faeroa reserata, that is, a description of the islands & inhabitants of Foeroe . . . written in Danish by Lucas Jacobson Debes . . . Englished by J. S.* ([London], 1676), sigs A2v and A3′.

56 The art of pruning fruit-trees, with an explanation of some words which gardiners make use of in speaking of trees: and a tract of the use of the fruits of trees, for preserving us in health, or for curing us when we are sick. Translated from the French original, set forth the last year by a physician of Rochelle (London, 1685); printed without a named translator but attributed to John Beaumont in *Oxford Dictionary of National Biography* (art. ‘Beaumont, John (c. 1640–1731)’ by Scott Mandelbrote).


59 Translators could also be nominated as Fellows on the strength of their work, as happened to Francis Lodwick and John Chamberlayne (see Henderson, *op. cit.* (note 31)).

Johannes Goedaert, *Metamorphosis naturalis* (Middelburgh, [1662?]); printed in English as *Johannes Godartius of insects. Done into English, and methodized, with the addition of notes* (York, 1682), sig. A3v (italics reversed).


*Fleta minor. The laws of art and nature, in knowing, judging, assaying, fining, refining and enlarging the bodies of confin’d metals. In two parts. The first contains assays of Lazarus Erckern, chief prover (or assay-master general of the empire of Germany) in V. books: originally written by him in the Teutonick language, and now translated into English. The second contains essays on metallick words, alphabetically composed, as a dictionary. By Sir John Pettus, of Suffolk, Kt. of the Society for the Mines Royal. Illustrated with 44 sculptures* (London, 1683), sig. C2v. The title ‘Fleta minor’ is a punning allusion to the fact that Pettus was imprisoned in the Fleet for debt at the time when the book appeared.

The history of the late revolution of the empire of the Great Mogul: together with the most considerable passages, for 5 years following in that empire. To which is added, a letter to the Lord Colbert, touching the extent of Indostan; the circulation of the gold and silver of the world, to discharge it self there; as also the riches, forces, and justice of the same; and the principal cause of the decay of the states of Asia. By Monsr F. Bernier, physitian of the faculty of Montpelier. English’d out of French (London, 1671). The ‘Heads’ begin: ‘1. What depth of Policy and Craft was used by Aureng-Zebe, the Heroe in this History... to supplant all his Brothers, and to settle himself in the Throne...; 2. A Mixture of Love-Intrigues, practised by the Princess Begum-Saheb, one of the two Daughters of the Great Mogol, Chah-Jehan.’

Jan Swammerdam, *Ephemeri vita: or the natural history of the ephemeron, a fly that lives but five hours. Written originally in Low-Dutch by Jo. Swammerdam* (London, 1681).


Debes, *op. cit.* (note 56), sig. A5v; Roland Fréart, *A parallel of the antient architecture with the modern... Written in French by Roland Freart, Sieur de Chambray; made English for the benefit of builders. To which is added an account of architects and architecture, in an historical and etymological explanation of certain tearms particularly affected by architects. With Leon Baptist Alberti’s treatise of statues. By John Evelyn Esq: Fellow of the Royal Society* (London, 1664), sig. a4v (italics reversed).
