Translated texts in the *Philosophical Transactions* and *Proceedings* of the Royal Society from the 17th to the 20th century

Online-Festschrift for Elke Teich

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Abstract. From antiquity to the modern era, translations have contributed to the production and circulation of scientific knowledge. From the time when the first English scientific journals began to appear in the mid-17th century, English translations of scientific texts by non-English-speaking authors began to appear in these journals. This paper highlights some aspects with regard to translations of scientific texts published in journals from the Royal Society of London between the 17th and the 20th century. The dataset used for the case study is the Royal Society Corpus (RSC) 6.0 / 7.0. Translations for the Royal Society journals were often produced by Fellows or secretaries of the Royal Society. Most translated articles found in the corpus were published in the Philosophical Transactions during the 18th century as translations from French. Overall, the translations in the RSC are characterised by domesticating practices.

Keywords. history of science; history of translation; specialised corpora of scientific writing; specialised translation; translationese

1. Introduction.

It is a pleasure to dedicate this paper to Prof. Dr. Elke Teich whose work in English linguistics and translation studies has greatly enriched my own. In this paper, I would like to highlight some aspects with regard to translations of scientific texts published in journals from the Royal Society of London between the 17th and the 20th century. From antiquity to the modern era, translations have contributed to the production and circulation of scientific knowledge (Fabbro 1988, Montgomery 2000, Pantin 2007, Plescia 2011, 2017, Coldiron 2014, Manning & Owen 2018, Gutas et al. 2022). Generally, the use of various vernacular languages became common in scientific publications from the 17th century onwards. The increasing number of languages used in scientific publications and the international correspondence and exchange of research papers between natural philosophers enhanced the importance of translators in the scientific domain (Turner 2008, Fransen 2017). When the first English scientific journals such as the Philosophical Transactions began to appear, English translations of scientific texts by non-English-speaking authors began to appear in these journals whose editors wanted to include information on scientific developments abroad (Banks 2018).

The dataset used for the case study on translations in the Royal Society journals is the Royal Society Corpus (RSC) 6.0 (1665-1996, cf. Kermes et al. 2016) and the forthcoming corpus re-

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lease RSC 7.0.[1] The RSC includes the digitised texts from Royal Society journals, mainly from the Philosophical Transactions, the Proceedings and their more specialized successor journals Philosophical Transactions A and B (after 1887) and Proceedings A and B (after 1905) with texts from the mathematical and physical sciences in the A series and from the biological sciences in the B series. The source texts of the translated scientific texts are not included in the data for a direct comparison with their translations. Many of them were handwritten manuscripts or letters submitted to the Royal Society of London from abroad.[2] Some were printed texts that had already been published abroad. By looking at the translated texts in the RSC even without their source texts, we can gain valuable insights into the development of scientific network and discourse patterns.

2. Identification of translated texts in the RSC

In order to identify articles in the RSC that are English translations from various source languages, the information in the article titles is often the most valuable source. 162 texts in the journals in the RSC have some information on their status as a translation in their headlines. Additionally, many of these article titles contain information on the source language. In various cases, we also find information on who the translators were if their initials, surnames or full names are given.

Examples (1) and (2) below are titles of two translated articles in the Philosophical Transactions from 1733 and 1751.

(1) *Proposals for the Improvement of the History of Russia […] Printed at St. Petersburg, for the Imperial Academy of Sciences. By Ger. Fred. Muller, Prof. Hist. Petropol. and F. R. S. Translated from the German by Mr. Zolman*

(2) *Experiments made on a great number of living animals, with the poison of lamas, and of ticunas, by Mons. Herissant, Doctor of Physic, and F. R. S. Translated from the French, by Tho. Stack, M. D.*

Another method to find translated texts is to look at the metadata in the forthcoming release version RSC 7.0. In addition to the data from the 6.0 version, the RSC 7.0 also includes the metadata category "Author Role". Author roles in the corpus can be, for instance, text authors, correspondents, recipients, reviewees, editors or translators. These roles were annotated manually by an external annotation provider in the source data obtained from the Royal Society before the compilation of the corpus, and they were integrated now into the RSC 7.0 version. There are 126 texts in the dataset that have translator information annotated in this metadata category in the form of initials, surname or full name. These texts are partly a subset of the 162 texts I identified via the information in the text titles. When we combine the results obtained from queries for texts with translation-related information either in the text title or in the metadata and delete the duplicates, we obtain a list of 200 translated texts in total from 1668-1991.

More texts in the data than these 200 scientific articles contain passages translated into English or entire translated texts (e.g. letters) embedded in non-translated English texts. For instance,

[1] The open version of the RSC 6.0 is available at: https://corpora.clarin-d.uni-saarland.de/cqpweb/

[2] As the Fellows kept good records of their activities, many of the original papers and letters received by the Royal Society can be found in the Library and Archives at the Royal Society's offices in London.

the very first issue of the Philosophical Transactions in 1665 included translated passages of a book review from the first issue of the French scientific Journal des Sçavans. Henry Oldenburg had produced this English version, but he had also added some extra information to the original text, left out certain passages and reorganised its structure some extent in the article prepared for the Philosophical Transactions (cf. Banks 2018). We will leave such texts aside for the purpose of the present paper.

In the following, I will summarize some data related to the 200 texts identified as English translations of research papers in the RSC. Most translated articles found in the corpus were published in the Philosophical Transactions during the 18th century. The highest number of translations was published in the mid-18th century – between the 1720s and the 1770s alone, 169 out of the identified 200 texts were published. Figure 1 gives an overview on the number of translations per time 50-year time period in the RSC.

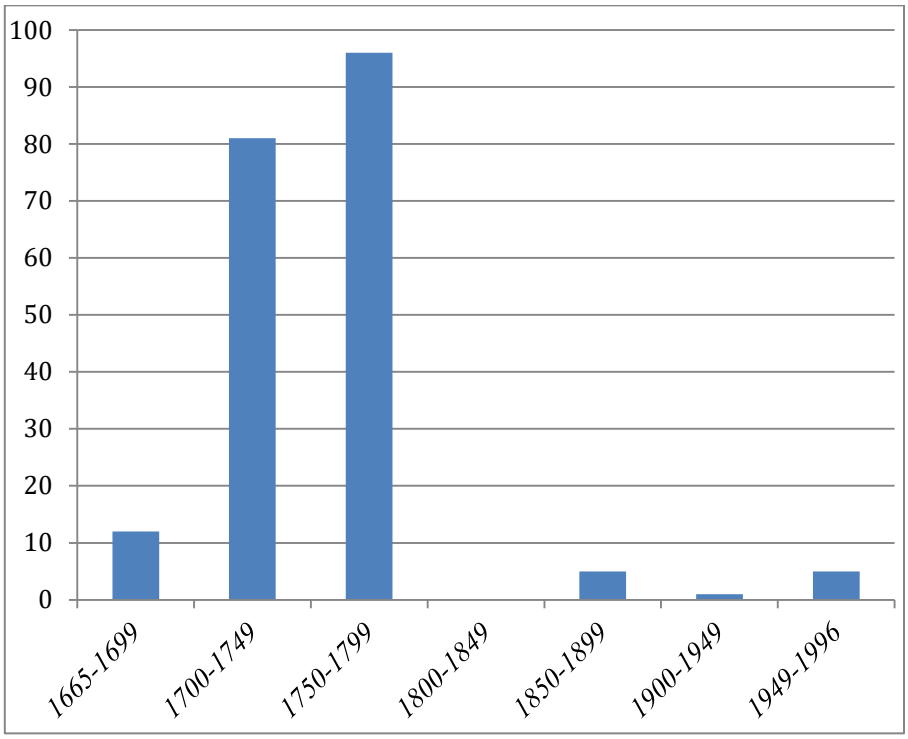

Figure 1: Translated articles per 50-year time periods in RSC

More than 10 translations in the data can already be found in the second half of the 17th century. Between 1700 and 1749, 81 translations were published, and between 1750 and 1799, there were 96. It is interesting to observe that in the following time-span 1800-1849, we do not find any. The RSC also contains a few translations that were published in the second half of the 19th century or in the 20th century. The ones published in the 20th century appeared most often in the Proceedings.

3. Source languages and text topics.

Sometimes no source language is specified in the articles, but with some additional manual analysis, we can often derive the information on the source language from the context, e.g. if the title or the author of the original text or its place of its origin is mentioned or if the names of the translators are given and we happen to know which source languages they worked with for other texts. Most cases are direct translations from one language into another. Example (3) from the first half of the 18th century is an exception as a translation via several languages. This text was translated from Chinese into Latin, then into French and finally into English.

(3) *An Explanation of the New Chronological Table of the Chinese History, Translated into Latin from the Original Chinese, by Father Johannes Franciscus Foucquet, Soc. Jes. Bishop of Eleutheropolis, and Published at Rome in the Year 1730. Collected from Two Accounts Thereof, Written in French, One Sent from Rome by Sir Tho. Dereham, Bart. to the Royal Society, the Other Sent from Father Foucquet to Father Eustache Guillemeau, a Barnabite at Paris, and by Him Transmitted to Sir Hans Sloane, Bart. Pr. R. S*

Figure 2 gives an overview on the number of translated texts per source languages for those texts that contain explicit information on their respective source language. The source language is not always the mother tongue of the authors, not only in the case of Latin as the source language, but also in several other case. The RSC contains, for instance, a letter originally written in French by the Italian cartographer Rizzi Zannoni that was published in the Philosophical Transactions in 1768 as an English translation produced by Mathew Maty.

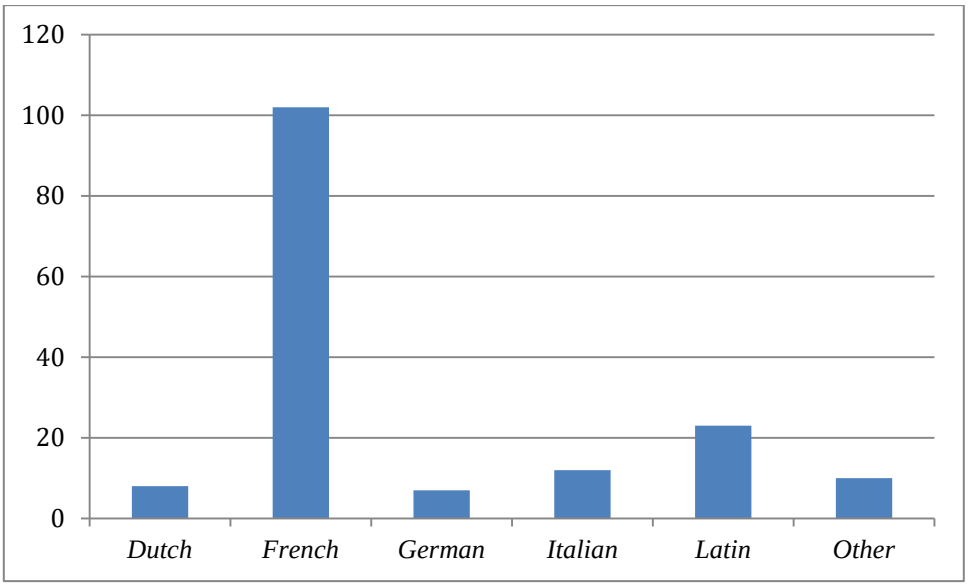

Figure 2: Number of translated texts in RSC with explicit information on their source language

As can be seen in Figure 2, most translated texts in the data are translations from French. Italian is also among the most frequent source languages, and the earliest translations in the RSC from the 17th century are typically from also from French or Italian. Various scholars still submitted their manuscripts in Latin in the 17th and 18th century. 420 research articles were

published directly in Latin in the Royal Society journals, e.g. a letter by the Swedish astronomer Pehr Wilhelm Wargentin from 1766.[3] 23 English translations of Latin articles were identified among the translations that contain explicit information on their source language. Therefore Latin is the second most source important language here. 8 texts contain information on Dutch as their source language. Only 7 texts were identified that were translated from German (sometimes labelled as 'High Dutch' in the older data). The RSC contains more English translations of Latin texts written by speakers of German than translations from German. Other sources languages of translations in the RSC are Arabic, Chinese, Spanish, Persian and Russian.

From the translated texts in the RSC, we know that the Royal Society sometimes provided grants for the English translation of publications by its Foreign Members. The Russian physiologist Ivan Pavlov, for instance, thanked the Royal Society for such a grant in a Croonian Lecture in 1928. The text of this Croonian Lecture was also translated into English and published in the Philosophical Transactions. The translator of this text was Gleb Anrep, a Royal Society Fellow who had studied under Pavlov in his early years before emigrating to England and who had also played a role in the translation of other works by Pavlov.

As the metadata for the RSC texts contain topics assigned via topic modelling (Fischer et al. 2018), we can see in which fields represented in the Philosophical Transactions most translations were required. Table 1 shows an overview of the primary topics for the translated texts.

Text topic	Number of texts
Astronomy	29
Biology	42
Chemistry	15
Reporting	88
Other	26

Table 1: Primary topics of translations in RSC

The primary topics for the translated texts were mainly astronomy, biology, chemistry and reporting (a topic that has been assigned to texts from different disciplines that contain reports on scientific observations or experiments).

4. Translators.

Even with a metadata category that includes some hints on the translators' identity for more than 60% of our 200 translations, there can be difficulties in identifying the translators of the texts. There is some spelling variation in the data with regard to personal names, and they can be given in their original, latinised or anglicised version. Some translations from German and Dutch from

[3] The Royal Society journals also contain entire texts and smaller passages in other languages than English or Latin, e.g. a letter with astronomical observations by Jean Dominique Cassini from the 1680s in French, an article with over 40 pages and the title "Del modo di render sensibilissima la più debole elettricità sia natural, sia artificiale" by the Italian physicist Alessandro Volta from the 1780s and a research paper in German by the physicist Georg Hermann Quincke from the 1890s. The RSC metadata have a text language attribute with a two-letter ISO 693 code (en, fr, es, la, it, sv, ro), but we excluded articles whose main language is not English from most corpus versions.

1713 to 1723 were produced by the Royal Society Fellow Conrad Joachim Sprengwell, a German physician and Physician-in-ordinary to William III and George I. Sprengwell's name in the translated texts and their metadata is given as *C. J. Spregnell* and *Dr. Sprengell*. The Royal Society's Fellows Directory[4] also lists other forms of his name, e.g. *Springle* and *Springal*. Other examples for variants of a translator's name in the metadata and in the texts themselves are the anglicised forms *Philip Henry Zollman*, *Phil. Hen. Zollman*, *Henry Zollman* and *Mr. Zolman* for the German cartographer Philipp Heinrich Zollmann. Additionally, the names of translators are often abbreviated to their initials, sometimes in reverse order, and tend to be followed by other abbreviations. For instance, if the text title contains the information *"…Translated from the French by P. H. Z. F. R. S.*[5]*"* or *"…Translated from the French by T. S. M. D.*[6] *F. R. S."*, we may also find *P. H. Z.* and *T. S.* as translator information in the metadata. The RSC 7.0 has Fellow IDs in the metadata as unique identifiers for Fellows (e.g. NA290 for Sprengwell, NA1848 for Zollman) so that it is easier to identify people with various forms of their names and to distinguish between multiple people with the same name, e.g. to distinguish the Royal Society Fellow and translator William Watson (NA7588, cf. Table 2), from various other Fellows with the same name. In some cases where no information on the translator is given, we can assume with some degree of certainty by whom that text was translated. For instance, if we know from a text from 1755 that Thomas Birch, a Secretary of the Royal Society, had translated it from French to English, he is probably also the translator of other articles from the same time period, e.g. Example (5), although this article title does not explicitly mention that the text was translated by Birch himself, and the author role assigned to him in the metadata is 'recipient', but not 'translator'.

(5) An account of an earthquake felt at Colen, Leige, Maestricht, &c. on the 19th of November, 1756: in a letter from Mr. Abraham Trembley, F. R. S. to Thomas Birch, D. D. Secretary to the Royal Society. Translated from the French

The translations for the Royal Society journals generally were produced by Fellows or secretaries of the Royal Society (e.g. Birch). At the beginning of the 18th century, the Royal Society responded to the growing need to handle its foreign correspondence and established a sub-office of the secretaries to deal exclusively with foreign correspondence. It was in the 1720s that the post of the Foreign Secretary (initially termed 'Assistant to the Secretaries for Foreign Correspondence') was created (Massarella 1992). This explains the high number of translations from that period onwards. The first person to hold this office was the above-mentioned Philip Henry Zollman.

The linguistic abilities of people like Zollman gave them a privileged position as 'diplomats of science' who maintained a myriad of contacts with international scholars (Rusnock 1999: 159). Philip Henry Zollman, for instance, like his father Johann Ludwig Zollmann, was in regular contact with Gottfried Wilhelm von Leibniz. Zollman also accompanied members of the Royal Family on visits to Germany and worked temporarily for the British ambassador in Paris (Massarella 1992). The office of Assistant to the Secretaries for Foreign Correspondence was held by the Swiss naturalist Johann Caspar Scheuchzer in 1728 during the absence of Zollmann.

[4] https://catalogues.royalsociety.org/CalmView/personsearch.aspx?src=CalmView.Persons [accessed on 19/03/2023]

[5] P. H. Z. = Philip Henry Zol(l)man, F. R. S. = Fellow of the Royal Society

[6] T. S. = Thomas Stack, M. D. = Doctor of Medicine

Scheuchzer translated, for instance, an article on the causes of gout from Italian into English. According to the Royal Society Fellow's Directory, Zollman held his office from 1723-1728, but texts translated by Zollman can be found in the RSC until the year of Zollman's death in 1748. After his death, the English physician Thomas Stack became the main person officially responsible for the foreign correspondence of the Royal Society. From 1729 to 1751, Stack produced almost one fourth of the translations that are included in the RSC. Other Foreign Secretaries of the Royal Society who produced translations for the Philosophical Transactions were, for instance, John Bevis (For. Sec. 1766-1771). While the historical importance of women's translations of scientific texts has been emphasised, e.g. by Kawashima (2011), all translations in the RSC were produced by men, with the exception of one from German into English by Rosemarie Teare, published in the Proceedings A in 1980.[7]

Table 2 gives an overview of the translators of whom we know from our corpus analysis that they produced more than five translations of scientific journal articles. They were all scientists themselves and Fellows of the Royal Society. [8] Most of them were Foreign Secretary of the Royal Society for some time, but they also provided translations for the Philosophical Transactions in periods were they did not hold this office.

Translator	**Time period when translations were published**	**Texts**	**Source language(s)**
Zollman, Philip Henry (elected as F.R.S. in 1727; For. Sec. 1723-1728)	1729-1748	19	French, German, Latin
Stack, Thomas (elected as F.R.S. in 1738; For. Sec. 1748-1751)	1729-1751	44	French, Italian, Latin
Watson, William (elected as F.R.S. in 1741)	1742-1755	10	French, Italian, Latin, Spanish
Parsons, James (elected as F.R.S. in 1741; For. Sec. 1751-1762)	1751-1764	8	French, Latin
Maty, Mathew (elected as F.R.S. in 1752; For. Sec. 1762-1766)	1755-1774	12	French
Other or N.A.	1668-1991	107	Arabic, Chinese, Dutch, French, German, Italian, Latin, Persian, Russian

Table 2: Translators of texts in RSC who produced more than 5 translations

[7] Title: *Statement from R. Pohl to C. A. Hempstead, 25 July 1974, in Krefeld*

[8] Zollman was not a Fellow of the Royal Society yet at the beginning of his translation activities for the Royal Society, maybe due to his regular correspondence with Leibniz, a rival of Isaac Newton who was the president of the Royal Society until 1727. In 1727, when Hans Sloane succeeded Newton as president, Zollman was elected as e a Fellow of the Royal Society.

5. Linguistic features and "translationese" effects.

It seems difficult to identify any source language 'shining-through' (Teich 2003) or other translationese effects via corpus linguistic analyses of the translations in the RSC. The source texts of the translations in the RSC are not available in digitised form. Moreover, there are not too many translations in the data compared to the number of non-translated texts. The translations identified in the data represent a rather large time span, and they are unevenly distributed with regard to their source languages. Moreover, the source language is not always the mother tongue of the respective author. Nevertheless, what these translations have in common is that they were typically produced by multilingual scientists from the Royal Society's network who had some experience in the translation of scientific texts, but who did not have translation as their main occupation. Even if some of these scientists produced translations on a more regular basis when they held the office of the Royal Society's Foreign Secretary, they had other tasks as well, e.g. the scientific administration of the Royal Society.

After reading many translated texts from the corpus closely and conducting corpus queries for syntactic and morphological structures that I would expect in the translations, e.g. noun phrases with certain types of premodifiying and postmodifying structures or word formation elements that would be more typical in Romance or continental West Germanic languages than in English, I noticed that the translations in the RSC are generally characterised by domesticating practices.

Queries for loanwords and borrowings from Romance languages and Neo-Latin with nominal suffixes such as *-ment, -ance, -ation, -ity, -age* and *-eur* or with adjective-forming suffixes such as *-esque, -ique* lead to lower results, normalised per 10.000 tokens, in 18th century translations from these languages than in a sample of 18th century non-translated texts. While many of the non-translated English texts contain foreign words, phrases or spellings, there are few foreign elements in the translated texts apart from exceptions such as publication titles in foreign languages that are referred to (e.g. *Journal Britannique*[9]) or culture-specific items such as titles of courtesy (e.g. *Monsieur*) that we can also find in non-translated texts. This could be an indicator of normalisation as the tendency to exaggerate features of the target language and the desire of the translators to remain invisible in these translations.

Scientific expressions in this time period were often borrowed into English from other languages, but our translated scientific texts do not seem to contain more features than other texts that might have led to contact-induced language change. Nevertheless, a few examples can be found in the translations where certain terminology is quoted in the original language, e.g. in (6), an extract from a text by the French surgeon Claude Nicholas le Cat translated by the British surgeon Michael Underwood. The translator uses the term *fluide conservateur* coined by the author of the source text and adds an English adjective-noun construction as a clarification of the term that we might see as an example of translation-inherent explicitation.

(6) This nervous juice I termed fluide conservateur, the preserving fluid, in my physiology.

[9] It is interesting to note that the *Journal Britannique* containing information on books published in England was published in the Hague between 1750 and 1755 by the Dutch physician and son of a French protestant minister Matthew Maty – one of the translators identified in the RSC texts whose translations were published in the Philosophical Transactions from 1755 onwards (cf. Table 2).

Although the translators generally strove for fluency, the sentence structure in certain translated texts seems rather complex as the following extract (7) from a 18th century text on observations on Venus and the moon by the German astronomer John Jerome Schroeter (Johann Hieronymus Schröter) demonstrates.[10]

(7) When, in the more falcated phases, we wish to observe distinctly and accurately this diminution of light at the farther extremities of the cusps, it is necessary to advert that, whilst about the middle of the terminating border between d, e, where the luminous part has its greatest breadth, this diminution, if seen under favourable circumstances, is too perceptible to leave the least doubt or suspicion, the points of the cusps, especially when the weather and other collateral circumstances are not favourable, appear, indeed, somewhat fainter, but yet almost as bright as the outward limb near b.

Overall, a research gap with regard to the linguistic features of the English translations in the RSC still remains to be filled. The few authors who have looked at translation practice at the Royal Society either focussed on an individual text in detail (Banks 2008) or on translation activities for other purposes, e.g. the translations of letters, research papers and books ordered by the Royal Society to be used at their meetings or copied and archived into their Register Book (Henderson 2013). We may study the translated scientific articles from the RSC in more detail on their own or contrast them with comparable non-translated texts. However, an even more successful method, although probably rather time-consuming, would be to search for the original texts and to create a parallel corpus that we can use for a comparative analysis. The fact that most of the translated texts were produced by scientists with linguistic skills and similar translator profiles is probably the reason for various linguistic similarities between these texts.

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