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Translation and the early scientific press
Or: Why scientific papers should be regarded as translatorial activities

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Abstract

While the first discipline-specific scientific periodicals of the late 18th century are marked by the integration of full-text translations, these translations nearly disappeared from scientific periodicals towards the end of the 19th century. This development can be seen in the light of tensions already present in the early practice of full-text translations, such as the preference for 'original' material expressed by the readership of the journals, the time lag produced by translations, the changing role of national public spheres, as well as tensions related to the medium of the periodical press. However, the near disappearance of full-text translations could also be seen as a transformation of translatorial activity within the scientific community. With the evolution of the scientific paper as having to state the current state of research for a given topic on an ideally transnational level, the translatorial activity is transferred to every author of a scientific paper – an evolution that goes hand in hand with the idea of scientific papers as addressing a 'universal' audience, despite their being written in a particular natural language.

Keywords: scientific periodicals, national public sphere, Lorenz Crell, Annales de Chimie, Journal de Physique, Nicholson's journal

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While the first discipline-specific scientific periodicals of the late 18th century are marked by the integration of full-text translations, these translations nearly disappeared from scientific periodicals towards the end of the 19th century. This development can be seen in the light of tensions already present in the early practice of full-text translations, such as the preference for 'original' material expressed by the readership of the journals, the time lag produced by translations, the changing role of national public spheres, as well as tensions related to the medium of the periodical press. However, the near disappearance of full-text translations could also be seen as a transformation of translatorial activity within the scientific community. With the evolution of the scientific paper as having to state the current state of research for a given topic on an ideally transnational level, the translatorial activity is transferred to every author of a scientific paper – an evolution that goes hand in hand with the idea of scientific papers as addressing a 'universal' audience, despite their being written in a particular natural language.

Introduction

While GIPPER (2022) remains one of the rare studies on early scientific periodicals in Western Europe focussing exclusively on the issue of translation,[1] the presence of translation is mentioned in nearly all studies concerned with the beginnings of the scientific press. This applies to the studies concerned with individual periodicals (CROSLAND 1994; HUFBAUER 1982; LILLEY 1948; MCKIE 1957; MCCLELLAN 1979; WATTS 2014), but also to studies offering more general perspectives on the institution of the scientific press (KRONICK 1976; MEINEL 1994, 1997; STICHWEH 1984; PFEIFFER & VITTU 2008; CSIZAR 2018). Dominantly quantitative approaches such as MENZEL (2023) are still exceptional, but likely to become more frequent. At present, they seem to confirm observations and quantitative work made in earlier studies on the subject noticing increasing percentages of translations in journals in the 17th and particularly the second half of the 18th century and a decrease of translations within journals towards the very end of the 19th century (cf. MEINEL 1994, 1997; STICHWEH 1984; MENZEL 2023). Finally, there have been numerous studies situating the scientific press in

[1] Other exceptions are STEFANI-MEYER (2008) who focuses on translations in the *Journal des Savants* as well as PFEIFFER (2020) and TURNER (2008) who are concerned with translations from the *Philosophical transactions*. Generally, the *Journal des savants* and the *Philosophical transactions* have received large scholarly attention, yet these journals do not quite fit the profile of the scientific periodicals focussed on in the present study. This is due to their covering a much wider range of disciplines, but also, in case of the *Transactions*, of them becoming the medium of the *Royal Society* which modifies their position in the realm of scientific publications.

broader developments of book markets and international trade, especially in the 19th century British context (e.g. TOPHAM 2013). However, the focus on international aspects does not necessarily lead to a detailed analysis of translational activity, which remains difficult to trace, as translators often remain anonymous and journals rarely leave well-organised archives. Nevertheless, it is interesting to note the different framing of translational activity depending on the overall perspective adopted by the studies. While Watts, for example, situates the translations in Nicholson's Journal within a journalistic habit of reprinting material (cf. WATTS 2014: 393), Meinel sees in them signs of "awareness and reception [...] across language barriers" (MEINEL 1994: 54), while specifying that this is not only evident in translations, but also in the extraction of foreign material, etc., all of which leads to a practice of "multiple publication and multiple translation" (MEINEL 1994: 50) characteristic of the early scientific press. A slightly different focus characterises the studies written by historians of science. Crosland, for example, identifies translators within the 'editorial staff' of the Annales de Chimie, and is prompted by their lack of substantial scientific credentials (cf. CROSLAND 1994: 328). Lilley, on the other hand, identifies significant deficiencies in the translated material, for example on mathematical issues that had been discussed among French scientists but had not yet 'travelled' to Britain. He also cites the difficulty of access to foreign scientific journals for the British audience of Nicholson's journal, thus conceding that translations "were not the repetitive waste that they seem at first sight to be, but were in fact most important, at least to a large number of readers" (LILLEY 1948: 95).

These few remarks should suffice not only to testify to the interconnectedness of methodological choices, disciplinary perspectives and approaches to translation, but also to show that there is still ample room for an approach that takes the history of translation as its point of departure, especially since the data collected offer the prototype of a problem that requires a historical approach: that of observable change.[2] The evidence for a strong presence of translations in early scientific journals, followed by an almost complete disappearance at the end of the nineteenth century (cf. STICHWEH 1984; MEINEL 1994, 1997; MENZEL 2023), deserves further investigation. While the gradual disappearance of Latin as a lingua franca within the Republic of Letters in the 18th century and the rise of the nation-state in the 19th century certainly provide the context for this development, its precise dynamics remain to be analysed in more detail. This is obviously beyond the scope of a single article, but the following pages will attempt to offer at least some preliminary reflections and observations on the subject.

These reflections owe much to the works of two scholars who have contributed fundamental insights into the changing role of translation in the early scientific press, namely Meinel and Stichweh. Meinel focuses on quantitative developments, tracing the number of translations in French, German and British scientific periodicals (with an emphasis on chemistry) throughout the 19th century. He explains the decline in translations towards the very end of the 19th century by the emergence of discipline-specific national societies and abstract journals providing translational services for scientists. He also highlights specific developments within countries, such as the shift of translations to less prestigious

[2] Concerning the tendency of research in translation history to focus on stability, cf. PYM (1998: 115).

scientific journals in the case of France. Stichweh observes the same intriguing 'disappearance' of translations from scientific journals towards the end of the nineteenth century (cf. STICHWEH 1984: 441), but is less concerned with alternative sources of translations on which scholars could rely. Instead, he describes the reduction in translated articles as a symptom of a 'new' scientific public that conceives of itself as 'universal', even if linguistically restricted: Assuming this "interessante Vorstellung, daß Publikation in wissenschaftlichen Zeitschriften Kommunikation mit einem universellen Publikum ist, das keinerlei Einschränkungen hinsichtlich Nationalität und Sprache unterliegt" (STICHWEH 1984: 441), the absence of translations seems less surprising, or, one could argue, even necessary, insofar as translations suggest that the national public sphere in question is not 'universal', but surrounded by other public spheres that produce valuable articles. These intriguing questions are not addressed in detail in Stichweh's account. Rather, he adds a second argument to explain the progressive absence of translations in scientific journals, and this argument develops around a change in the overall function of scientific journals within disciplines: Whereas earlier journals could pretend to offer a complete overview of all new relevant findings in the discipline at an international level (through translations!), the general increase in scientific activity and publications over the course of the nineteenth century made this promise less and less realistic. Thus, as Stichweh argues, journals gradually abandoned translation.

The following study expands on the findings of both Stichweh and Meinel by presenting more detailed observations of concrete translation practices and discourses in scientific journals, focusing on the period between 1770 and the 1860s. Later developments, such as those mentioned by Meinel, are thus not part of the following investigations, although their relevance to the overall topic of translation in the scientific press is undeniable. A similar argument can be made with regard to comparative data on the role of translation in less specialized journals. It is evident that such a broader frame of reference would constitute a desirable object of study. However, it would require a longer investigation of a corpus of material that was not the focus of the DFG[3] project that funded this study. For this reason, the following analyses are limited to a small selection of scientific journals, in order to examine how the treatment of translations interacts with other developments within the specialized scientific press and, above all, with the development of the 'original' scientific paper.

It will be argued that the development of the scientific paper partially 'resolves' certain tensions that can be observed around the role of translation within scientific journals. However, in order to appreciate this 'solution', it is first necessary to trace the problems associated with full-text translation in scientific journals. To this end, the present study has collected observations on four early scientific journals, namely Crell's *Annalen der Chemie*[4] which is often termed the first (non-medical) discipline specific journal, the French *Annales de Chimie* (1789-1815), which began as a translation project of Crell's *Annalen*, Rozier's *Observations sur la physique, sur l'histoire naturelle et sur les arts et métiers* (also called *Journal de Physique*) (1771-1793) which pioneered scientific

[3] German Research Foundation.

[4] The title *Chemische Annalen* is used to refer collectively to the four distinct journal titles *Chemisches Journal* (1778–1781), N*eueste Entdeckungen in der Chemie* (1781–1784), C*hemisches Archiv* (1783–1798), *Chemische Annalen* (1784–1804).

journalism in France but lost credit when its late editor refused to accept the 'new chemistry' propagated by the *Annales de Chimie* and Lavoisier, and finally *Nicholson's Journal* which was commented on as being the first journal of its kind in England, modelled on the French *Journal de Physique* (cf. ANONYM 1799: 283). The choice of these journals is thus motivated by linked genealogies, roughly comparable periods of publication, and structural analogies (such as a relatively high degree of specialization and quality control[5]) that should facilitate a comparative approach. A comprehensive counting of the translations included in these respective journals could of course serve as an initial step in this comparison. However, since the question addressed in this article does not require the use of in-depth quantitative data, it seems acceptable to rely on information provided by the editors on control samples, as well as on previous studies that estimate the number of translations ranging from an average of 20 % for the *Annales de Chimie* (cf. MEINEL 1997: 141) to 30 % for *Nicholson's journal* (cf. TOPHAM 2013: 136). Such figures might easily be subject to Anthony Pym's 'descriptive trap': "Translation is important; let's look at translation; see, translation is important, isn't it?" (PYM 1998: 25). In the context of this paper, however, these percentages serve merely to attest to the fact that translations did indeed form a non-negligible part of early scientific journals. This fact in turn contrasts with later publishing practices, whereby translations were largely absent from scientific journals (cf. MEINEL 1994: 56), a practice that can again be observed today. Without presuming to provide an explanatory account of a development spanning nearly an entire century, the following pages aim to present observations that may be worthy of consideration when attempting to comprehend the fluctuating presence of translations within scientific journals. As a heuristic tool (without any deterministic claim), these observations will be organized around the tensions that emerge between the practice of publishing full-text translations and the challenges inherent to this practice.

Translations and/or Originals – challenges of a new audience

The first tension could be described as that between the presumed need for translations and the articulated desire for original work. This tension is clearly evident in the paratexts of the journals, be they editorial prefaces or reviews. These justify the presence of translations as a response, on the one hand, to the scientist's need to be aware of relevant findings from abroad and, on the other, to the needs of those scientists and amateurs who could not afford the publications of the academies, which were the authoritative institutions for the sciences in question. Thus, Crell clearly states that his translations of the publications of the *Académie des Sciences* and the *Royal Society* were intended for his readers who lacked these resources. He asserts, "[i]ch kann sicher annehmen, dass unter meinen Lesern nicht der zwanzigste Theil, die mehresten geschweige alle die

[5] The relatively high standards are clearly stated by Rozier: "Nous rejetterons en consequence ce qui ne seroit que compilation indigeste, & dénuée de vues neuves & utiles. L'importance des matières, la maniere dont elles feront prélentées, nous décideront sur le choix des morceaux qui doivent être insérés dans ce Recueil. Nous n'offrirons pas aux Amateurs oisifs, des Ouvrages purement agréables, ni la douce illusion de se croire initiés dans les Sciences qu'ils ignorent" (ROZIER 1773: v).

theuren Schriften der Akademien besitze" (CRELL 1781: s. p.), which is an argument found in almost identical form in Nicholson and his continental model Rozier:

And when we reflect on the very limited circulation of academical transactions, from their price, their number, their extent, distance of publication, difference of language, […] it is also certain that, from one or other of these causes, even the best memoirs they contain must continue unknown to a very large class of men of science (NICHOLSON 1797: iii–iv).

mais la plûpart des Collections académiques, sont écrites dans la Langue nationale, & imprimées plusieurs années après que la lecture des Mémoires a été faite. Pendant ce tems, on ignore des faits qui peuvent être de la plus grande utilité pour les Sciences. D'ailleurs, ces Collections devenues très-nombreuses, & par-là très dispendieuses, surpassent souvent les facultés de ceux qui seroient en état d'en profiter. (ROZIER 1773: iii–iv)

It is apparent that the supply of translations is aimed at a 'larger' audience, one that is unable to afford the publications and, naturally, is not affiliated with these institutions. However, it is noteworthy that while the journals provide translations for this audience, they also have to respond to the demand for more 'originals', as evidenced in Crell and Nicholson's prefaces:

It is certain that, if every article in a journal of science were to be professedly original, it would be a work of comparatively much less value to philosophers and the public (NICHOLSON 1797: iii).

Ich habe zwar den Wunsch gelesen, daß ich mehrere eigenthümliche Versuche, als bisher, in einem Band vereinigen mögte […] (CRELL 1781: s. p.).

The demand for original works is evidently at odds with the printing of translations, given that these constitute the 'non-original' material to which extracts from foreign works could be added. This demand is indeed intriguing insofar as it reflects an interrogation of the coexistence of translated and original works. However, it is even more intriguing in that it is driven by the same enlarged audience, presumably in need of translations of the unaffordable publications of the academies. It is precisely this audience that made the early scholarly journals successful, allowing a somewhat larger group of people to interact within the virtual realm of a journal. This interaction could take different forms, but in the case of the journals discussed, the exchange of experiences played an important role, as Crell's description of the function of his journal makes clear:

Um Erfindungen zu machen, sie zu erweisen, oder sie zu berichtigen, muß man die bereits gemachten kennen. Eine Entdeckung entwickelt eine Zweyte, so wie ein Funke den andern. Oft verwendet man vergeblich seine Zeit auf eine Untersuchung, weil man nicht wußte, daß sie schon gemacht war. (CRELL 1781: s. p.)

The fact that the journals allowed their readers to save time and effort on experience is also emphasised by Lilley (cf. LILLEY 1948: 97). But perhaps even more importantly, the journals offered the opportunity to contribute minor findings that gained importance by being integrated into a larger disciplinary whole formed by the readers of the newly created journals (cf. HUFBAUER 1982; PFEIFFER & VITTU 1980: 297). In a sense, this audience, which did not have access to the academies that provided a regular meeting place for their members, seems to have sought its own meeting place through the journals. And the ideal form of interaction in these was obviously the direct exchange of 'original' work provided by readers and contributors. How else could one explain that Volta, who had privileged access to European scientific institutions, wanted to found an academic journal on the peninsula (cf. PFEIFFER & VITTU 2008: 295)? The idea of creating a journal that would bring together the work of fellow Italian scientists seems to testify to this new dynamic of a sociological widening of the participants in scientific research. And it was precisely this expansion that undoubtedly increased the need for published translations (which Volta explicitly wanted to include in his journal project), since – unlike the elite scientists, whose intensive international correspondence (cf. BRET & GRISON & SADON-GOUPIL 1994; BERGMANN 1965; LAVOISIER 1955ff.; OLDENBURG 1966) proves that they had means of keeping up with international research besides published translations – this new public had to rely on journals that brought this research within their immediate reach. At the same time, however, this new audience wanted original content that demonstrated the presence of a scientific community beyond the more cosmopolitan scientific elites.

Interestingly, this tension seems to have been perceived by the contemporaries of these developments, though without being clearly formulated. Rozier, for example, in the preface to his journal, simply remarks: "II semble qu'à mesure que le nombre des Savans s'est accru, la Correspondance, entre ceux des Nations différentes, a été rallentie" (ROZIER 1773: iv). And Crell takes great pains to justify his desire to publish translations of the *Transactions* alongside the original work by stating that these translations were in fact serving his countrymen:

Meine vorzüglichste Absicht, der ich alle anderen nachsetze, und der größte Nutzen dieses periodischen Werks, ist die Erweiterung der chemischen Kenntnisse unter meinen Landsleuten. Nicht blos durch Mittheilung solcher Versuche, die hier zuerst bekannt werden, erhalte ich meinen Endzweck; sondern auch durch solche, die zwar von andern gemacht sind, aber nicht allgemein genug bekannt seyn können. Deshalb glaube ich diese Absicht besser zu erreichen, wenn ich jährlich 4 Bände liefere, welche viele Auszüge aus den Werken akademischer Gesellschaften erhalten, als wenn nur ein oder zwey Teile erfolgten, die blos mit originellen vaterländischen Arbeiten angefüllt wären. (CRELL 1781: s. p.)

Whatever one may think of Crell's efforts to persuade his readers, his discourse expresses the underlying tension in the readership of his journal. This readership had apparently conflated the concepts of 'being an original work' and 'being a domestic work', as Crell's phrase "originelle[n] vaterländische[n] Arbeiten" suggests – a conflation that puts translations in an unenviable position.

Translation and time – challenges of scientific progress

A second tension appearing in the journals concerning translations revolves around issues of 'time', or rather the inevitable time difference that is inherent to translation as being posterior to a source text. This tension could already be sensed in the preface to Nicholson's journal, expressing the pertinence of publishing non-original material, found for instance in the memoirs of Academies, even if these had been published a considerable time ago:

Whenever, in the progress of investigation, discoveries thus buried from the knowledge of the world, shall' present themselves, the rational plan of a public journal will require them to be brought forward, though years may have elapsed since their first publication (NICHOLSON 1797: iv).

Now, it may seem surprising to the modern reader to even consider the relevance of translating material published years ago, but in the case of the *Memoirs of the Academies*, this relevance must be seen in the light of the prestige of these institutions, which produced the authoritative knowledge of the time in their respective countries. For a finding to be regarded as a discovery, it had to be presented at meetings of the *Royal Society* or the *Académie des Sciences* and it was these institutions, with their technical facilities for replicating experiments and carrying out expensive research missions, that provided what might now be called qualified peer review. The importance of their publications can therefore hardly be overestimated, which explains why their translation seemed highly desirable. However, one of the major problems of the academies, and one of the main reasons for the success of scientific journals, was the relatively slow pace of their publication. The *Mémoires* of the *Académie des sciences* and the *Philosophical Transactions* which began as Henry Oldenburg's journal but became the official organ of the *Royal Society* in 1751 (cf. FYFE et al. 2015), were notoriously slow to appear, sometimes provoking year-long delays between the period of discovery, the reading in front of the Academy and the publication of the findings in the respective *Transactions*. If to this we add the time necessary to translate these *Transactions*, the risk of publishing outdated knowledge seems obvious – a risk confirmed by a review of Crell's *Annalen*: "Wozu endlich auch die so späten Auszüge aus den Denkschriften der Gesellsch. u. Akademien d. W.? Die mehresten besitzen wir schon in anderen frühern Uebersetzungen und mehrere sind entweder widerlegt oder verbessert, und also jetzt nicht mehr passend" (ANONYM 1788: 160). It is not surprising, therefore, that Crell and other journal editors wished to publish the findings presented at the *Academy* meetings before they even appeared in their *Transactions*, as evidenced by a request from Crell to the chemist Guyton de Morveau:

En general, je vous serais très obligé, si vous voudriez m'envoyer des copies, oú [sic] des extraits de mémoires chymiques, qu'on a lus à l'illustre Acad. R., pour pouvoir en faire usage dans les Annales ; car ces extraits n'empêcheroient pas du tout, qu'on pourrait après tout aussi bien les faire imprimer en francois, comme si je n'en avois pas fait usage (Correspondance Crell-Morveau, Archives Académie des Sciences).

However, the Academies were understandably reluctant to share the contents of their meetings (cf. MCCLELLAN 1979: 446), and Nicholson was severely sanctioned by the President of the *Royal Society*, Joseph Banks, for inadvertently publishing

results that had not yet appeared in the *Transactions* (cf. WATTS 2014). Interestingly, the *Royal Society* was less strict about translations of offprints given to members of the Society before publication in the *Transactions* (cf. WATTS 2014), but these offprints likely circulated among the well-connected elite (cf. LILLEY 1948: 91) and could not simply be translated and published by the journal editors. In this respect, Crell's request expresses above all a desire for attractive and current material, a desire that could hardly be satisfied with translated material alone, which was not always available within a reasonable time. Regarding the tension between timeliness and translation in scientific publishing, one could hardly imagine a more telling example than the project formed by Liebig at the beginning of the 19th century: As Meinel explains (cf. MEINEL 1997: 145), Liebig meant to have his *Annalen der Pharmazie* (later called *Annalen der Chemie und Pharmazie*) published simultaneously in German, French and English, a plan testifying to the peculiar exigencies of scientific publishing. These exigencies may prove impossible to ensure in many concrete instances, but are nevertheless intrinsically linked to the mechanisms of scientific research. Since in science, no results can claim to be definitive, any time difference between publications and their translations, might entail an invalidation of the translated finding.

In the context of book translations, this fact leads to all sorts of adjustments that translators make in order to 'update' the translated text, in particular by including contradictory evidence.[6] In the context of journal translations, however, these adjustments are less extensive and less frequent, and in any case they cannot resolve the fundamental temporal tension between any publication and its translation, when these texts do not appear simultaneously, as in Liebig's (unrealised) plan. Interestingly (yet not surprisingly, if we recall Derrida's *différance*), the very idea of publishing journals simultaneously modifies the question of original and translation to some extent, showing that questions of temporality touch on very essential aspects of the problematic status of translation in scientific contexts.

This is evident in concerns about the priority of findings, which is why readers of Rozier's journal asked him to give the exact publication date of source material in translations, something he had not done at the beginning (cf. BERGMAN 1965: 106-107). But it probably also explains why the *Annales de Chimie* gave translation and 'translation control' by the editorial board a firm place in its directives (cf. BRET 1997: 426): If journals wanted to include foreign material and beat the *Academy* in terms of publication speed, translation had to be ensured within short time frames and could not be left to chance or the goodwill of people willing

[6] Cf. Elsherif in the present volume; Seligardi's claim that "journals were better than translation of monographs", because "book reviews and articles allowed critiques and comments to be expressed in a more open way than a translator's preface to a book" (SELIGARDI 2013: 427) is instructive because it underlines the 'critical' aspect of translations. The evidence concerning French translations of scientific work in the 18th century though shows that translators of monographs did indeed comment the translated works rather openly, in footnotes, but also in prefaces. The practices of critical footnotes and the replication of experiments before publication that Meinel links to Liebig's term 'Experimentalkritik' can also be found in the translation practices of the 18th century, as Gipper has shown concerning translations in Rozier's journal (cf. GIPPER 2021). For a different use of the term 'critical translation' cf. SAß (2023), who derives this practice from the editorial work of 'critical editions' of literary authors.

to translate well and quickly. In fact, as Berthollet's correspondence with Morveau shows, the *Annales de Chimie* benefited from the translation skills of Claudine Picardet, who had no official role within the *Annales de Chimie* but was a skilled scientific translator (cf. BRET 2014).

Nous espérons du zèle de Madame Picardet. (31 mars 1789)
J'ai recu la traduction de Mad Picardet: la Société des Annales lui sera bien oblige: priez la de lui continuer ses bons offices. (6 juin 1789)
Venez donc à notre secours le plus promptement avec Madame Picardet. (août 1789) (Correspondance Berthollet-Guyton de Morveau, Archives AdS)

However, this does not contradict the fact that the explicit mention of translations, their control and payment in the directives of the *Annales de Chimie* shows a concern for timely translations. It is also worth mentioning that Lorenz Crell and William Nicholson were themselves scientific translators, a fact that is rarely emphasised in relation to their personalities, but which is by no means negligible: if timely and accurate translation is the bottleneck of translation in scientific journals, then it must be extremely helpful to have these skills as editors. In this respect, these editors follow the polyglot model of scholarly editing embodied by Henry Oldenburg, who combined translatorial and editorial work for "[his] transactions" (OLDENBURG 1966: 433).

Translation and space – challenges of the national sphere

Where time is concerned, questions of space usually cannot be ignored, and the question of translation is of course no exception to this rule. For in addressing problems of synchronicity or delay between the publication of source texts and translations, it has been tacitly assumed that the locations of these publications are somehow congruent with the modern conception of nation-states. The prototype of this idea is expressed in Liebig's project of a synchronous publication in German, French and English, which in a sense only seems 'complete' when these respective versions are published synchronously in Germany, France and England.
As examples from the 18th century show, this congruence between the language of a journal and the space of its production and publication is of course untenable, since French journals were published outside France and many German journals did not have a national impact, as Stichweh points out with regard to the many 'local' journals in the German-speaking countries (cf. STICHWEH 1984: 409). Crell's *Annalen*, on the other hand, were expected in various parts of Europe as an access to chemistry in Germany, but also in Sweden (cf. BRET et al. 1994: 129), while Rozier's journal was received by chemists in England, as can be seen from a letter in which Kirwan mildly criticises Morveau for publishing some experiments in the *Nouvelles de la République des lettres* instead of using the more accessible channel of Rozier's journal (cf. BRET et al. 1994: 57). From the example of Kirwan waiting in London for Crell's *Annalen* and Rozier's *Journal de Physique*, one could of course extrapolate the potential of journals to create virtual spaces for transnational scientific exchange, an idea that is alluded to in several of the prefaces to our journals, but one has to take these discourses with a pinch of salt. While Lilley and Watts rightly underline the *function* of *Nicholson's journal* as forming a space for transnational discussion on electro-chemistry during a period

at the start of the 19th century, the rhetoric of the journals tends to imply the collection of knowledge within the realm of the journal, giving them the character of 'centres'.

On ne sauroit trop inviter ceux qui veulent faire des progrès dans les Sciences, à rapprocher les connoissances transmises par les Savans de tous les siécles & de tous les pays. C'est un préalable nécessaire pour parvenir à de nouvelles découvertes. (ROZIER 1773: v–vj)

Le cas où s'est trouvé M. Braun, & tant d'autres, avant ou après lui, démontre jusqu'à l'évidence la nécessité d'un dépot général pour les découvertes. Nous l'offrons aux Savans. Cet Ouvrage déja répandu dans les plus grandes villes de l'Europe, constatera leurs travaux. Si par des raisons particulières, ils ne veulent pas nous communiquer leurs dissertations, nous leur demandons au moins le simple exposé du fait, le résultat clair & précis de leurs expériences. On leur répond de la fidélité de la traduction en quel que Langue qu'ils écrivent: cependant, on les prie, si, pour eux la chose est facile, d'écrire en Latin ou en François. (ROZIER 1773: 8)

In both cases, Rozier implies the centrality of his journal, which may of course be advantageous and even necessary for the progress of science, since it potentially creates a common ground of knowledge. However, this idea also implies a certain 'megalomania', since it would only be defensible if all scientists agreed to publish in Rozier – an expectation that must have seemed unreasonable even at the time, since the 'symbolic capital' was still awarded by the academies. A publication in Rozier could thus certainly be advantageous, but it could by no means replace the consecration given by the Academies, as Lavoisier's negotiations between the different spaces of publication illustrate, apart from his depositing of important discoveries in sealed envelopes at the *Académie des sciences* (cf. POIRIER / BALINSKI 1996). To put it another way: Rozier may have been able to offer a virtual space for transnational research, but the contributors were still dependent on their respective local support systems, which Rozier could not replace. In this respect, of course, it is a charming rhetorical strategy to claim that the contributors to the journal 'own' it: "Telles ont été les raisons qui nous ont engagés à entreprendre ce Recueil; & nous les présentons avec d'autant plus de confiance, aux savans Etrangers, que ce sera leur ouvrage" (ROZIER 1773: v). In fact, even if Crell, for example, paid contributors (though this was rather exceptional), the journals remained 'virtual' spaces, dependent on material conditions provided by other institutions – or individuals, as in the case of Lavoisier, whose laboratory was the centre of the *Annales de Chimie*. In this sense, the journals could hardly offer a truly autonomous space, and it is not surprising that they lived rather symbiotically with the institutions and 'spaces' of the time. Their collection of texts and their intensive translation work thus contributed to the centrality of the respective national spheres and their languages, rather than creating a fundamentally transnational sphere.
This 'nationalising' potential of translation has been commented on in the past (cf. DIZDAR et al. 2014; GIPPER in the present volume), a very striking historical example being Guyton de Morveau's "Mémoire contenant des vues pour conserver à la langue française la prérogative d'être la langue universelle", which explains the intimate link between translation and the concern for the centrality

of the target language and the scientific community (cf. BRET 2016; MANNWEILER 2021, 2024) – a concern that responded directly to the German translation furore and that was also perfectly compatible with patriotic claims, as seen in the person of Crell, who in his journal combines intense translation work with emphatic patriotism. Yet it seems that the potential of translation history to elucidate this desperately vague concept of 'nation' has not yet been fully explored (cf. SAKAI 1997; BERMANN & WOOD 2005 for existing work). And while it is true that observing translation activities in scientific journals cannot provide a definition of the nation, it may well help to problematise certain preconceptions about its supposed emergence in the nineteenth century. For what emerges from certain details of the above-mentioned translation activities is a peculiar role of the national public sphere, a role that could be described as a pseudo-epistemological function that this sphere assumes and that is paradoxically reinforced by translation.

To grasp this function, one might consider the complaints of some translators about the reluctance of their target audience to accept insights from abroad – especially if they contradict cherished healing methods such as bloodletting: "Je scai qu'il combat un préjugé trop enraciné en France & sur-tout à Paris, pour trouver une approbation générale. Les Partisans outrés de la saignée & les ennemis des narcotiques condamneront d'emblée le livre de M. Lobb" (BOYER DE LA PREBANDIER 1749: iij). But on an even more fundamental level, this pseudo-epistemological function must be grasped in the very opacity attributed to the national public sphere in the context of the journals discussed. When Lorenz Crell suggests that he could print translated information from the *Académie des Sciences* in his journal and that this information could then be printed in France "as if [he] had not made use of it", this implies precisely a bizarre opacity of the respective national spheres. An opacity that he himself is obviously able to transcend, since he negotiates between the two spaces but which he nevertheless assumes. And one gets a very similar impression with regard to Banks's reaction to Nicholson, when he states that translations of papers presented to the *Royal Society* and published outside England might be acceptable and even welcome, while premature publication within England could not be tolerated. Again, the respective 'national' spheres are imagined to be opaque to one another, meaning that it is possible to treat things that happen outside the respective spheres as simply 'not happening', which is more than a simple lack of information. This 'pseudo-epistemological function' of the national sphere is also perfectly expressed by Morveau when he mentions that for the readers of Rozier's *Journal de physique*, things are 'new' that have simply been published in another language:

j'imagine qu'il veut par la donner a ses mémoires un air de nouveauté pour se concilier l'attention de bien des lecteurs qui ne veulent que du neuf et qui ne savent pas se rendre compte que ce qu'ils ne connoissent pas encore, est tout neuf pour eux, a quelque date qu'on l'ait publié dans une langue qu'ils ne pouvoient entendre (BERGMAN 1965: 170).

However, one might ask whether, by providing full-text translations of these findings formulated in other languages, Morveau is not paradoxically reinforcing, or at least adhering to, this 'pseudo-epistemological' function of the national public sphere: if everything outside the national sphere can be ignored, then

everything that should not be ignored must be brought into it, and thus translated into it. Now, this seems to be a view of the national public sphere that could be perceived as somewhat patronising, since editors and translators get to decide what the public 'knows'. But it is also definitely a view that seems to have changed over the course of the nineteenth century – if we are to accept Stichweh's description of the move towards a 'non-translating' scientific press as addressing a 'universal' audience. Of course, one might ask how the word 'universal' could be used in the context of a monolingual address. Since it is obvious that this address and the audience addressed are not universal, at least not in a linguistic sense, but either germanophone (in the case of the audience Stichweh is referring to), or francophone, or anglophone, and so on. And of course one could simply assume that Stichweh uses 'universal' in the sense that has been delegitimised by the 'universal' claims of the respective imperial nations, this universality having been aptly described as the history of the refusal of universality (cf. MESSLING & SOLTE-GRESSER 2023: 36).

What Stichweh is referring to, however, is most likely a different kind of universality, which is the exact parallel to the universality of scientific facts, which are neither culturally dependent nor changing in their truth value according to the 'national' language in which they are expressed. This universality finds its correlate in the idea of an audience that allows facts to be refuted at any time and from any source, and that could not *admit* ignoring facts simply because they have been published elsewhere. This audience is thus 'universal' in the sense that it assumes national aspects to be epistemologically irrelevant,[7] and, as Stichweh argues, this audience is expected to be able to navigate the world of scientific journals and information sources (cf. STICHWEH 1984: 441). This audience is thus similar to the 'elite' scientists of the 18th century, who were able to keep abreast of relevant international developments through personal contacts (within and outside the academies), correspondence and the emerging scientific press. And for this elite – whose standard would seem to be applied to all participants in the scientific field –, it could be argued that full-text translations in journals were probably not essential. However, the fact that our journal editors went to the trouble of providing these translations in the journals could be seen as a transitional phase in which findings from abroad had to be presented to the 'national public' in order to 'matter'.

This, of course, echoes the logic of the academies, which, as 'nationally' representative bodies, determined what was relevant in the respective sciences, including findings from abroad by their foreign members or reports by their members via translation or extraction of foreign material. Now, one could very well compare the functioning of our early journals with that of the academies, as they also assumed the role of collecting all relevant findings in their fields, including those from abroad, via translations. However, as Stichweh rightly notes, the assumption that a single medium could adequately collect all the relevant information became increasingly untenable with the growth of scientific activity in the 18th and 19th centuries. Consequently, translations were progressively excluded from journals, which were no longer able to claim to encompass all the pertinent material for their respective disciplines.

[7] On the substantial practical relevance of the national and linguistic origin of scientific findings cf. GORDIN (2015).

Translation and periodicals – challenges of a medium

While the impossibility of presenting complete selections of disciplinary findings relevant at a 'national' level seems a very plausible argument for the disappearance of full-text translations in journals at a time of increasing international scientific publication, there may be a final 'tension' to consider when assessing the disappearance – or rather transformation – of translational activity in journals. This tension revolves around the medial properties of scholarly journals, which are, after all, a subform of periodicals. As such, they represent a form of collective authorship, as opposed to the idea of a single author in monographs, and a form of serial writing that creates a strong connection between the readers and the respective journals. This aspect is undoubtedly present in Benedict Anderson's account of newspapers in the development of nations as 'imagined communities' (ANDERSON 1983), but it is even more evident in the idea of scientific journals as catalysts for scientific communities, in which readers of journals are potential contributors and contributors are also readers (cf. STICHWEH 1984; HUFBAUER 1982). The journal thus appears to be particularly well-suited to the practice of scientific publication, thereby supporting the fundamentally collective and dynamic nature of scientific research. However, the inclusion of full-text translations in journals does not seem to be the ideal way of exploiting the potential of the journal medium: First, it separates the text from its original dynamic research community if the translation is from another journal. Secondly, it unintentionally gives the text the status of an 'authoritative' work by performatively underlining the integrity of the text as text. And third, it diminishes the role of the translator, who cannot add substantive footnotes or commentary to journal translations, since the purpose of journals is to present translations as quickly as possible and within the page limits set by the journals. In this respect, book translations, with their practice of extensive commentary and footnoting, paradoxically seem somewhat closer to the dialogical character of the sciences than do full-text translations in journals (which, of course, does not solve the problem of speed).

One might ask, however, whether full-text translation really covers the whole range of translatorial activity within journals. A first alternative that comes to mind is, of course, the practice of extraction and abstracting, which has grown in importance in response to the sheer volume of relevant material. But as Meinel observes, this practice of abstracting had its limits and was progressively outsourced into 'secondary' publications. Furthermore, it never replaced the reading of full-text articles, which scholars continued to value, surprising as it may seem (cf. MEINEL 1997: 146).[8] It may therefore be worthwhile to consider other forms of alternative translatorial activity that can be derived from the practice of full-text translation. Upon examination of these translations, it

[8] An interesting commentary on the practice of extracting can be found in Baudrillart's preface to his translation of Burgdorf's *Nouveau Manuel forestier*: "Plusieurs personnes m'avaient conseillé de ne présenter qu'un bref extrait de l'ouvrage; mais outre que ce n'eût pas été remplir les vues de l'administration, qui a désiré qu'on le fît connaître dans tout ce qu'il pourrait nous être utile, c'eût été en rompre le plan général, et n'offrir que des membres épars, sans liaison avec le corps de cet ouvrage, et par conséquent sans intérêt pour la science. On se méfie d'ailleurs beaucoup des extraits, et on a raison. Un traducteur profite de cette manière d'opérer, pour passer les endroits qu'il entend difficilement, et qui souvent sont les plus intéressans" (BAUDRILLART 1808: s. p.).

becomes evident that while the translations themselves were only sporadically footnoted by the translators and editors, the selection of source texts to be translated reflected the agendas of the editors/contributors and previous publications in the journals. In this way, the translations can be regarded as 'outsourced' or 'explained' footnotes to the original articles. A particularly striking example is the translation policy of the author-editors of the *Annales de Chimie*, who either chose to translate chemists such as Klaproth whose work supported the New Chemistry published in the original articles in the *Annales*, or employed translations to provide counter-evidence to chemists arguing against the New Chemistry, such as Kirwan. From this perspective, these translations point to another crucial correlate of Stichweh's 'universal' audience, and that is the 'Fachaufsatz' or 'scientific paper'. The scientific paper, it could be argued, should be seen as a translatorial activity in that, in its ideal form, it presents the relevant state of research on its subject, regardless of the language in which that research has been published.[9] In gathering all the relevant evidence for and against its own argument, the scientific paper translates and recodes text and, moreover, perfectly reflects the dialogical potential of the periodical medium. In this sense, it could be a no less suitable indicator of "awareness" (MEINEL 1954: 54) than full-text translations. The reduction of full-text translations in periodicals could thus also be seen as a transformation of the translatorial activity, shifting it from the editors and translators of the periodicals to every author of a scientific article.

Conclusion

In describing the production of the scientific paper as a translatorial activity, this paper has drawn upon the methodological resources of the history of translation. For an understanding of the practice of the scientific paper as translatorial would not have been possible without first studying the practices of scientific translation in the 18th century. This research provides a perspective on the scientific paper as an evolution of practices and a solution to many of the challenges facing scientific translation. The following quote from the prolific scientific translator Lefebvre de Villebrune provides a succinct illustration of these practices:

Je m'attendois à trouver des vues neuves de pratique dans la dernière édition allemande que M. Murray de Gottingue a donnée de la traduction de Roseen. Il n'y a rien que nous ne sachions bien, excepté quelques faits nouveaux sur les vers ; mais plus relatifs aux adultes, & à l'histoire naturelle, qu'aux maladies dont il s'agit dans cet Ouvrage. La version Hollandoise, & les notes de M. Sandifort de Leyde, ne m'ont non plus montré rien de neuf. Dès qu'un fait a été bien prouvé, cent autres faits semblables n'apprennent plus rien: ainsi, il est inutile de les citer. (LEFEBVRE DE VILLEBRUNE 1786: x)

[9] A very similar idea is expressed in ROZMYSLOWICZ (2022): "Die Erwartung, in wissenschaftlichen Texten den aktuellen Forschungsstand zu verwerten und deshalb auf die Arbeiten anderer explizit bezugzunehmen, um die Relevanz der eigenen Arbeit herauszustellen, macht das Übersetzen zu einem inhärenten Bestandteil internationaler und multilingualer Wissensproduktion" (128).

In order to find new information about a given scientific fact, Villebrune explicitly consults various translations of the same text. The practice of comparing different translations is of course common in literary translations, but the difference with Villebrune's motives of comparison could not be greater. For Villebrune is not concerned with how the source text was translated, but rather with any new information that the translators/editors may have added to their translations. This confirms the practice shown by Elsherif (this volume), as well as Stefanelli's observation (also this volume) that scientific translators are often scientists themselves. Above all, however, it suggests the proximity between scientific translation and the production of a scientific work. Rather than being primarily concerned with reproducing the integrity of a source text in another language, scientific translation also examines the validity of the source text and confronts it with the current state of research. It is only stating the obvious to say that these practices are exactly what is expected of authors of scientific papers.

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