Chronotopos
A Journal of Translation History

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A favourable ecosystem for scientific translation projects: Strasbourg's role in the production and transnational circulation of knowledge in the 1780s.

1/2023
DOI: 10.70596/cts149

Herausgegeben am / Éditée au / Edited at: Institute of Applied Linguistics and Translatology (IALT), Leipzig University
ISSN: 2617-3441

Abstract

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Keywords: social history of science and knowledge; translation; mineralogy; chemistry; Alsace

Zum Zitieren des Artikels / Pour citer l'article / To cite the article:
Fischer, Daniel (2024): A favourable ecosystem for scientific translation projects: Strasbourg's role in the production and transnational circulation of knowledge in the 1780s, *Chronotopos* 5 (1), 113–136. DOI: 10.70596/cts149

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Abstract

Strasbourg's geographical and political position during the eighteenth century led to the longstanding assumption that the capital of Alsace naturally fostered the circulation of German and French ideas and knowledge. Throughout the century, many travellers flowed through this city on the Rhine, which was viewed as the Eastern gateway to France even though its population remained primarily German-speaking. This study reconstitutes Strasbourg's total catalogue of 189 publications during the 1780s, enabling us to assess the provincial city's role in producing and circulating knowledge on both sides of the Rhine and more widely in Europe leading up to the French Revolution. We examine evidence of the reasons for the large volume of scientific publications, including a surprising level of investment into German translations. Finally, we present the specific case of the translated works of Lavoisier and Ehrmann published in Strasbourg in 1787, revealing new details that indicate that the local publishing sector's rationale went beyond geographical and linguistic opportunities.

Introduction

Strasbourg's unique geographical position along the Rhine, as a key stop on the route linking Paris, Vienna and Berlin, and its political situation as a French city since 1681 whose population remained largely German-speaking throughout the 18th century, meant that it was always a nodal point for the movement of travellers, goods and ideas between the German-speaking world and France. Printed matter was also an important part of this exchange. As the city's censors noted:

[Strasbourg's] booksellers supply part of Germany with French books and reciprocally supply the French with books printed in Germany and in the North. This is what gives this kind of trade a considerable scope that would be hard to find elsewhere.[1]

Similarly, the director of the Library in Paris, writing to the Strasbourg magistrate in 1786, said: "Your city is all the more interesting in my eyes, as it is better placed than

[1] Letter from censor Zoepffel (1785). Quoted by Elloy (1973-1974: 11-12). These translations from the French are provided by the author of the article.

many others to serve as a meeting point or communication point between the two languages in everything to do with literature."[2]

It is well established that Strasbourg booksellers and printers catalogued numerous titles in German and French during the eighteenth century (cf. CLAUS 1977; CASTELLI 2017). Moreover, in the decade preceding the French Revolution, the *Bibliographie französischer Übersetzungen aus dem Deutschen* lists four Strasbourg translations from German into French, compared to nine among Parisian booksellers and printers (cf. BIHL et al. 1987). But the data from this inventory, covering only translations from German to French, is considered incomplete. Jérôme Schweitzer offers a broader view, identifying 579 titles published in Strasbourg between 1785 and 1794, including 74 in Latin, 136 in French and 369 in German. He further observed that "many of these works are translations or adaptations of scientific, technical or pedagogical treatises" (SCHWEITZER 2017: 1119). However, an in-depth analysis of Strasbourg's publications has not been conducted to date.

The aim of this article is to verify Schweitzer's observation by studying the scale, content and translations of Strasbourg's publications during the decade leading up to the French Revolution. Translation in the sciences is a field of historiography that has been revitalised thanks to the work of Patrice Bret (cf. BRET & MOERMAN 2014), which highlighted the growing linguistic compartmentalisation of scholarly publication in the 17th and 18th centuries. Bret examines the increasing necessity of translations during that era, as well as the market demand, logistics and skills involved in scientific translation at a time when the use of Latin as a *lingua franca* for scholars was disappearing (cf. GORDIN 2015). Furthermore, the work of Hans-Jürgen Lüsebrink on the role of translations in Franco-German cultural transfers (cf. LÜSEBRINK et al. 2017), provides another lens through which to examine Strasbourg's production of scientific translations in the 1780s.

The role of scientific publications in 1780s Strasbourg

There are several reasons for focusing on the 1780s to examine the role of science in the publishing strategy of Strasbourg publishers and printers. First, the difficult economic situation of the 1780s forced booksellers and printers, just like other businesses, to adapt their strategies to survive in the context of a stagnant market. Competition between booksellers, publishers and printers in Strasbourg was fierce, even though access to and oversight of the bookselling and publishing industry was regulated by the corporate authorities of the tribe of the Stilt.

Secondly, the 1780s in France saw important developments in the scientific community. Working with the group at the Arsenal, the chemist Lavoisier made discoveries that gave rise to modern chemistry. In late 1779, Lavoisier presented to the *Académie des Sciences* a report (which he had produced two years earlier), in which he identified and named the "acidifying principle" or "oxygine" to designate the part of breathable air that causes

[2] Letter from the Director of the Librairie to the Strasbourg Magistrate, January 1786, quoted by CLAUS (1977: 62).

certain substances to oxidise.[3] Oxygen and its role in combustion and chemical reactions was thus identified, sweeping away old paradigms and paving the way to new scientific advances in fields beyond chemistry, such as mineralogy and metallurgy. But the advent of modern chemistry took time to develop (as we will see in part through our case study on Ehrmann and Lavoisier publications in Strasbourg at the end of this article) – finally crystallising in 1789, with the publication of Lavoisier's *Eléments de chimie* and the creation of the journal *Annales de chimie*. Meanwhile, France was also the site of high-profile aerostatic experiments. Hence the 1780s were marked by publications and heated debate of various scientific theories across Europe.

This golden age of scientific inquiry and publication came to an end at the end of the 1780s, though, with the arrival of French Revolution. We see evidence of this shift, for example, in the entreaty made to a German publisher by Philippe Frédéric de Dietrich (1748–1793), who was a Strasbourg patrician and member of both the Royal Academy of Sciences in Paris and the *Societät der Bergbaukunde*. In a letter to Friedrich Wilhelm Heinrich von Trebra, Director General of Mines in Hanover, Dietrich requested that a translation of the *Bergbaukunde*, the society's yearbook, be published in Germany, explaining that:

It is more impossible than ever to have the Society's volumes translated and printed in France. In these troubled times, all our printing presses are busy printing political brochures and pamphlets, and the best scientific books, even the national ones, do not sell.[4]

The Strasbourg publishing industry 1750–1789

The world of books in Strasbourg is well known thanks to the description offered by the Strasbourgeois Theophil Friedrich Ehrmann in 1789.[5] Ehrmann's data, combined with additional information from Gournay's 1789 business almanac,[6] and notes on each publisher from the Bibliothèque Nationale de France (BNF) and the *Nouveau dictionnaire de biographie alsacienne* (cf. Barbier 1994; Keller 1998; Mariotte 1985; Zeller 1990) provide the following overview of the local industry (Figure 1).

[3] Lavoisier, Antoine Laurent de (1781): "Considérations générales sur la nature des acides et sur les principes dont ils sont composes". In: *Histoire de l'Académie royale des Sciences, année 1778, avec les Mémoires de Mathématiques & de Physique pour la même année*. Paris: Imprimerie royale, 536.

[4] Dietrich Archives (later ADD) 64/3, 590-591. Copy of a letter from Dietrich to Trebra, 11 November 1789.

[5] Ehrmann, Theophil Friedrich (1789): *Briefe eines reisenden Deutschen an seinen Bruder in H*** über verschiedene Länder und Gegenden von Europa*. Frankfurt/Leipzig: without any mentioned editor.

[6] Gournay, B.-C. (1789): *Tableau général du commerce, des marchands, négocians, armateurs, & c. de la France, de l'Europe, & des autres Parties du Monde, connu ci-devant sous le nom d'Almanach général du Commerce, &c*. Paris: without editor, 776.

Name of the publisher	**Type of business**			**Start of activity**	**Special features**
	Publisher	Printer	Bookseller		
Bauer & Treuttel	x		x	Founded by Bauer in 1748, partnership with Treuttel in 1772	The name "Bauer et Treuttel" was displayed from 1777 to 1783. The death of Bauer in 1781 led Treuttel, his brother-in-law, to keep only his name from 1783.
Dannbach	x	x		1784	Dannbach took over the Kürsner printing works in 1784.
Häussler	x			Since 1773	
Heitz	x	x		1717	Printer for the university and the town, the Protestant seminary and gymnasium, the Directory of the Augsburg Confession, the Prince of Hesse-Darmstadt, Count of Hanau-Lichtenberg. In 1789, the printing works was run by the fourth son and successor of Jean Henri I Heitz, Jean Henri Heitz II.
König	x		x	1748	In 1789, it was run by his widow and her two sons.
Kürsner	x			1724	Kürsner was not a bookseller, but his books were deposited with Seyfrid at the Marché aux Cerises. After being run by Jean Steinmann, who followed in Kürsner's footsteps, the printing business was taken over in 1784 by Dannbach, one of Kürsner's sons-in-law.
Le Roux (circa 1701–1790)	x	x	x	1729 or 1730	Printer to the king, the bishopric, the chancellery and the cardinal. Jean-François Le Roux (1701–1790) devoted himself to printing, while his son took charge of the bookshop.
Levrault	x	x		1767	Originally from Lorraine, Levrault initially worked with Christmann. Printer for the intendance and the episcopal university
Academic bookshop	x		x	1783	Founded by Salzmann and entrusted to Bartholomaï. The Librairie académique was taken over directly by

					Salzmann in 1785. Despite its name, it had no official link with the university.
Lorenz and Schuler	x	x		1777	Printer to the "immediate" nobility. Jonas Lorenz was apprenticed to König before 1762. Johann Friedrich Schüler, with whom he went into partnership in 1777, was his son-in-law.
Rolland and Jacob	x	x		1786	Employed in Kehl in 1783, they opened a type foundry in Strasbourg in 1784. At the end of 1786, they were authorised to open a printing works, but were not allowed to print in German. The company was also known as the "Société Typographique", and in 1789 became the King's ordinary printing house, before going bankrupt in December 1789.
Stein	x		x	Founded by his father around 1727	Bankruptcy in 1785, on Stein's death.

Figure 1: Strasbourg publishers and printers in the 1780s

After a period of relative stagnation beginning in 1750 and 1783, the output of the city's booksellers underwent a boom in which, according to the case of the Bauer and Treuttel bookshop studied by Annika Haß, the number of published titles increased and the presence of Strasbourg publishers was more pronounced at the Leipzig (Germany) book fairs (Haß 2023: 72). A new publishing house and bookshop, *La Librairie académique*, were also established in 1783 (cf. Claus 1977).

By the early 1780s, there were five publishers in Strasbourg, with a combined total of 16 presses. In 1786, Henri Rolland and Claude Jacob applied for the right to open a sixth publishing company in Strasbourg. Despite strong arguments – Jacob had been trained with the famous typographer and printer John Baskerville in Birmingham – the Strasbourg authorities, who supported the printers' guild, only agreed to their request on the condition that Rolland and Jacob not be permitted to print any posters or periodicals, nor any material in the German language (cf. Elloy 1974).

At this time, the city's six printers served the needs of their own publishing houses, but their presses could also print publications upon the request of other publishing houses, including German publishers. Local publishers could also have their works printed in Strasbourg or abroad (Claus 1977: 36). In one case for example, two different

publishers, Dannbach and Heitz, joined forces in 1778 to co-publish in Strasbourg the complete works of Alexander Pope,[7] translated from English into German.

From 1780 through 1789, a total of 189 titles were published in Strasbourg, excluding almanacs and calendars, academic works by university students, special event announcements, funeral orations, offprints of extracts from larger publications, newspapers, musical scores and political pamphlets under 20 pages (a genre that flourished as the Revolution approached). This figure combines 135 titles listed at the Bibliothèque Nationale de France (BNF) and 54 titles identified by cross-referencing French data with digitised German collections, publication announcements in periodicals[8] and library catalogues from the end of the 18th and the 19th centuries.[9] The holdings and investory of the municipal library would have been a valuable resource for such information, had it not burned down during the siege of 1870.

These 189 titles fall into five main categories: theology, law, science and the arts, literature and languages, and history (categories as defined by Jean-Charles Brunet, author of "Art de classer les livres d'une bibliothèque" (1790)).[10] Of these titles, 37% (70 publications) can be classified as "sciences and arts". However, the volume of works in this category varies by publishing house. Four publishers did not publish any books in sciences and the arts; and three published around one-third of their books in this category (Dannbach, Heitz and Levrault); while such publications accounted for more than 50% of new publications by three publishing houses: *La Librairie académique*, *König* and *Bauer & Treuttel* (later *Treuttel*) (Figure 2).

	Number of Publications					
Publisher	**Total**	**Theology**	**Law**	**Science and the arts**	**Literature and languages**	**History**
Bauer & Treuttel	34	1	0	19	4	10
Dannbach	10	1	3	3	1	2
Häussler	3	0	0	0	0	3
Heitz	17	2	2	4	7	2
König	19	0	1	11	6	1
Kürsner	5	1	0	0	2	2
Le Roux	7	4	1	0	1	1
Levrault	30	6	4	10	5	5

[7] POPE, Alexander (1778): *Sämmtliche Werke, mit Wilh. Warburtons Commentar und Anmerkungen*. Strasbourg: Heitz and Dannbach.

[8] The bookseller Treuttel, for example, advertises the books published and available in the *Intelligenzblatt der Allgemeine Literatur-Zeitung vom Jahre 1788*, 36, 313-314.

[9] (1799): *Catalogue des livres composant la bibliothèque de feu le C[itoy]en Dietrich, ancien Maire de Strasbourg, et membre de la ci-devant académie des Sciences de Paris*. Strasbourg: Levrault.

[10] BRUNET, Jean-Charles (1790): "L'art de classer les livres d'une bibliothèque". In *Dictionnaire bibliographique, historique et critique, des livres rares, précieux, singuliers, curieux, estimés et recherchés*, T.3. Paris: Cailleau et Fils, 511. Quoted by Haß 2023: 455.

Academic bookshop	36	4	0	20	5	7
Lorenz & Schuler	7	1	0	0	4	2
Rolland & Jacob	8	0	3	0	2	3
Stein	4	0	0	0	1	3
Self-publishing	2	0	0	1	0	1
Unknown	7	3	0	2	0	2
Total (% of total)	**189 (100%)**	**23 (12%)**	**14 (7%)**	**70 (37%)**	**38 (20%)**	**44 (23%)**

Figure 2: Number of works published in Strasbourg between 1780 and 1789, according to Brunet's categorisation

Since Brunet's "sciences and the arts" category includes liberal and mechanical arts, we further classified the titles by discipline in order to focus on titles considered "scientific" in contemporary terms. Of the 70 books, 66 can be linked to one of the major classes of the *Académie Royale des Sciences*, according to the reform of 1785 (cf. Brian & Demeulenaere-Douyère 2002). Anatomy, which we have chosen to combine with medicine, surgery and pharmacy, accounts for nearly 55% of the publications that we would describe today as "scientific". Natural history and mineralogy, followed by mathematics and physics, account for 18% and 12% respectively of the scientific titles published in Strasbourg in the 1780s (Figure 3).

Name of publisher	**Mathematics and physics**	**Anatomy, medicine, surgery, pharmacy**	**Natural history and mineralogy**	**Other academic disciplines**[11]	**Other**	**Total**
Bauer & Treuttel	1	11	1	6		19
Dannbach	1	1	1			3
Heitz			1	2	1	4
König		8		1	2	11
Levrault	1	5	3		1	10
Librairie académique	5	8	6	1		20
Self-publishing		1				1
Unknown		2				2
Total	**8**	**36**	**12**	**10**	**4**	**70**

Figure 3: Breakdown of scientific fields covered by Strasbourg publications in the 1780s

[11] The other publications directly linked to an academic discipline are detailed as follows: four in chemistry and metallurgy (three books by Bauer & Treuttel and one by König), three in botany and agriculture (by Bauer & Treuttel and by Heitz), two in mechanical engineering (by Bauer & Treuttel and by Dannbach) and one in astronomy (by *La Librairie académique*).

It remains to be seen what place Strasbourg publishers reserved for translations. Of the 189 titles published in the 1780s, 35 were translations. Of these translations, 65% (23 titles) were in the "sciences and arts" field (Figure 4).

	Number of Translated Publications and Total Number of Publications					
Publisher's name	**Translations / Total**	**Theology**	**Law**	**Science and the arts**	**Literature and languages**	**History**
Bauer & Treuttel	11/34	0/1		6/19	0/4	5/10
Dannbach	1/10	0/1	0/3	1/3	0/1	0/2
Häussler	0/3					0/3
Heitz	0/17	0/2	0/2	0/4	0/7	0/2
König	5/19		0/1	3/11	2/6	0/1
Kürsner	0/5	0/1			0/2	0/2
Le Roux	0/7	0/4	0/1		0/1	0/1
Levrault	2/30	0/6	0/4	1/10	1/5	0/5
Librairie académique	14/36	0/4		11/20	1/5	2/7
Lorenz & Schuler	0/7	0/1			0/4	0/2
Rolland & Jacob	0/8		0/3		0/2	0/3
Stein	0/4				0/1	0/3
Self-publishing	1/2			0/1		1/1
Unknown	1/7	0/3		1/2		0/2
Totals	**35/189**	**0/23**	**0/14**	**23/70**	**4/38**	**8/44**

Figure 4: The number of translations published in Strasbourg in the 1780s

Of these 35 translations, ten were translated from French to German, while five were translated from German to French. (Figure 5 provides a summary of all 35 translations across six languages). Of the 23 translations in "science and the arts",[12] four disciplines are represented: 11 in anatomy, medicine, surgery or pharmacy; seven in natural history and mineralogy; three in chemistry and metallurgy; and two in mathematics and physics.

[12] See appendix 1.

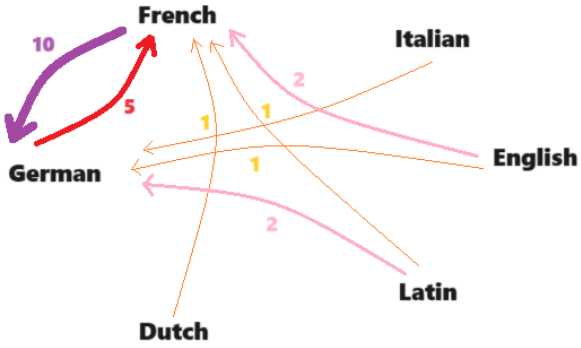

Figure 5: Source and target languages of scientific translations published in Strasbourg in the 1780s

As a point of comparison, in Frankfurt am Main was a similar sized economic and cultural crossroads city in 1789 with a population of 36,000, compared to Strasbourg's 45,000. Frankfurt was also home to one of the most important book fairs in the Holy Roman Empire (cf. ROTH 2013). During that period, however, Frankfurt only published 49 scientific works, including seven translations,[13] whereas Strasbourg published 70 scientific titles, including 23 translations. Thus, Strasbourg appears to have been a particularly active provincial city when it comes to 1780s scientific translations and publications.

In search of reasons for Strasbourg's strong scientific translation business

Several factors seem to have contributed to Strasbourg's active production of translated scientific publications. The city's renowned Faculty of Medicine, highly educated publishers and interpersonal, transnational relationships facilitated by Strasbourg's geographic position, in addition to the city's predominant French-German bilingualism and longstanding history in the publishing industry, created a highly conducive environment for such publications.

Although Strasbourg lacked an academy of fine arts, sciences and literature like those in other French provincial towns like Dijon, Metz and Nancy, the presence of a major university with an international reputation and links to Protestant Germany gave Strasbourg unrivalled prestige, enabling the city to claim exclusive control over local scholarly production. The role of the University of Strasbourg in the publishing industry was substantially enhanced by Strasbourg's special status, negotiated as part of the 1681 French annexation, under which the Strasbourg Magistrate retained the oversight of its own scientific publications – rather than being subject to the regulation and censorship of the Royal Academy of Sciences like the rest of France. The Magistrate regularly solicited input from eminent professors at the University of Strasbourg to guide local publishing decisions (cf. ELLOY 1974; CLAUS 1977: 13).

However, interest in scientific progress at Strasbourg's university remained limited to the Faculty of Medicine. Since medicine was considered the least noble of the four faculties (comprised of theology, philosophy, law and medicine), the Faculty's lighter

[13] See appendix 2.

weight of tradition meant that it had more latitude to keep abreast of emerging scientific developments. In addition to three academic chairs in (1) pathology and clinic, (2) botany, medical subjects and chemistry, and (3) theoretical and practical anatomy, the school also had an obstetrics department, founded in 1738 (MARGRAFF 1969: 21). The Faculty of Medicine attracted the largest number of students at the universiy. Some of its professors had a European reputation: Lobstein for anatomy and surgery, and Spielmann for chemistry. The presence of the university – thanks to its programmes, the academic work of its students and the need for textbooks – provided a base of activity for the city's booksellers, but the Faculty of Medicine was the largest driver of the city's academic publishing, accounting for more than half of the 70 scientific titles published in the 1780s.

The last third of the eighteenth century also saw the emergence of a generation of publishers who had themselves been educated before embarking on their careers in printing or bookselling. Salzmann, Heitz and Treuttel all had secondary education, as did König and Levrault. Their secondary studies were followed by travel, apprenticeships with Parisian booksellers, or university studies in Strasbourg or elsewhere in the Holy Roman Empire. Jean-Henri Heitz II, for example, attended the Protestant Gymnasium and also took private lessons in Hebrew and French (ELLOY 1974: 18). When he took over his family's bookshop-printing business in 1769, the operation was enriched by his language studies, travels and contacts in Paris as well as with Strasbourg's academic and pastoral elite. This new generation of well educated, well-travelled publishers was attuned to intellectual and scientific questions of the age, which impacted the selection of scientific works and translations.

Furthermore, the importance of interpersonal contacts in the publication of translations seems to have begun growing in the 1770s. Publishers sought to maintain personal relationships with intellectuals and writers, particularly those who stopped off in the city while travelling. When Alessandro Volta was welcomed to Strasbourg in 1777 as a member of the learned society gathered around the royal praetor, he established contacts in particular with Dietrich and Spielmann, whose scholarly merits he recognised.[14] The following year, his *Lettres sur l'air inflammable des marais* was translated not only into French by Jean-Jacques Barbier de Tinan and published by Heitz,[15] but also into German by Carl Heinrich Köstlin and published by Stein.[16] The following year, the printer Heitz once again entrusted Barbier de Tinan with the publication of a new translation from Italian into French, the *Mémoire sur les*

[14] VOLTA, Alessandro (1834): *Lettere inedite*. Pesaro: Tipografia nobili, 159.

[15] VOLTA, Alessandro / BARBIER DE TINAN, Jean-Jacques (transl.) (1778): *Lettres sur l'air inflammable des marais to which three letters by the same author from the Milan journal have been added, translated from the Italian*. Strasbourg: Heitz [Sull'Aria Infiammabile Nativa Delle Paludi (1777), Milan: Marelli].

[16] VOLTA, Alessandro / KÖSTLIN, Carl Heinrich (transl.) (1778): *Briefe über die entzündbare Luft der Sümpfe: nebst drey andern Briefen von dem nämlichen Verfasser, die aus dem Mayländischen Journal genommen sind*. Strasbourg: Stein [Sull'Aria Infiammabile Nativa Delle Paludi (1777), Milan: Marelli].

conducteurs électriques pour préserver les édifices de la éclair by Abbé Giuseppe Toaldo.[17] This trend continued into the 1780s; Jean-Georges Treuttel, for example, invited Sophie von La Roche to his table in 1786 and cultivated a personal relationship with her (Haß 2023: 57). Strasbourg's position as an important stop along the travel route of European scholars therefore triggered the publication of a series of translations from Italian into French and German, making up-to-date scientific knowledge available to French and German speakers.

It would be tempting to attribute this greater number of translations from French into German to the dominance of French as the language of choice for scholars after the decline of Latin, and before the early 19th century rise of a triumvirate of vernacular languages for scientific publications: English, German and French (cf. Gordin 2015). It is true, after all, that the city's elites were often bilingual. For example, Goethe (who was in Strasbourg in 1770–1771) lauded Frédéric Rodolphe Salzmann for his elegant French even though Salzmann considered himself to be a "perfect German".[18] As a bilingual city, Strasbourg was well-placed to respond to increasing demand for translations. In a context where the scientific community was eager to stay abreast of recent scientific discoveries that were increasingly compartmentalized by country and language, translations became essential. The accelerating pace of discoveries meant that translators had to work in a hurry. Scholars were no longer content with translating extracts or summaries from periodicals; they wanted complete and thorough translations by translators with the threefold skill of perfect command of the source language, the target language, and the specific, scientific lexicon (Bret & Moerman 2014: 631). Such rapid but high-quality translations were crucial for fuelling scientific progress across linguistic and national boundaries, and Strasbourg was ideal to respond for this demand.

It appears, however, that claims of a so-called French Europe in the 18th century and of French as a universal language have been exaggerated and insufficiently contextualised (cf. Beaurepaire 2007; Siouffi 2010). In reality, the 18th century saw the emergence of a multicultural dynamic, in which French "played its part … This multiculturality was built on the basis of a stratification of linguistic uses according to fields and contexts, as well as on the interweaving of transfers" (cf. Siouffi 2010). In chemistry, for example, the importance of Lavoisier's work – which was itself more widely diffused thanks to French-English translation, notably thanks to Madame de Lavoisier – paved the way for scientific translations from French into other target languages. But in other fields, such as mineralogy or the art of mining, advancements of German scientists led to increasing interest in translations from German into English or French in the 1780s. So the local prowess in French and German language is only a small part of the story.

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[17] Toaldo, Giuseppe / Barbier de Tinan, Jean-Jacques (transl.) (1779): *Mémoire sur les conducteurs électriques pour préserver les édifices de la foudre*. Strasbourg: Heitz [Dei conduttori per preservare gli edifizj da'fulmini memorie (1778), Venice: Storti].

[18] Goethe, Johann Wilhelm von (1986): *Aus meinem Leben. Dichtung und Wahrheit*. Frankfurt a. M.: Deutscher Klassiker Verlag, 525. Quoted by Haß (2023: 39).

A final, critical reason for Strasbourg's high level of scientific translations and publications is in fact market demand, but paradoxically not in Strasbourg itself. Given the bilingualism of educated classes in Strasbourg, local interest in translations from German to French or French to German was quite limited, and those involved in the book trade were aware that their work would find few buyers locally. The censor Zoeppfel stated in 1786:

Booksellers do not print to sell in the city. They print 1,000, 1,500 or 2,000 copies of their works, and pay little attention to the 10 or 20 copies that are sold in the city. The entire edition is destined to leave the country and is transported at great expense to Frankfurt or Leipzig, where it is exchanged for other books or paid for in silver.[19]

Before the 1770s, Strasbourg booksellers found themselves at a disadvantage at the major book fairs in the Holy Roman Empire. Since few titles were published in German in Strasbourg, they had little to trade and instead had to pay German booksellers for the titles they wished to offer their customers back in Strasbourg (Châtellier 1976). By increasing publication of German materials starting in the 1770s, Strasbourg booksellers became less indebted to German publishers, could sell in-demand, German language publications in Frankfurt and elsewhere, and could purchase and return with new German publications that were popular at home (Claus 1977: 99). It was in the light of the reality of this market that Strasbourg publishers looked for new titles to publish, and that the value of German translations grew, which explains the choice of German as the target language for translation in 14 cases out of 23.

Observing the specialisation within the scientific community, some booksellers specialised their catalogues. Dietrich, for instance, received from Treuttel all publications relating to natural history, chemistry, mineralogy and metallurgy, but once angrily returned to him three books on alchemy that had slipped into a book delivery, saying they were unworthy of his library.[20] These specialisations accompanied the growth of natural history and physics in publications between 1750 and 1790, while the already well represented areas of mathematics and medicine publications saw little change.

Publishing a work, especially if translation costs were involved, represented a major investment that did not always pay off. For example, Dietrich told Trebra that his French translation of *Erfahrungen vom Innern der Gebirge*, published in Paris in 1787, had found few buyers in France, and that he regretted his investment.[21] But if the market for scientific translations remained small in France, making Parisian publishers wary, the situation was different in Strasbourg. Local booksellers' need for books to sell

[19] Report by the censor Zoeppfel on the state of bookshops in Strasbourg, 1786. Quoted by Elloy (1974: 34–35).

[20] ADD 64/I/1, 57–58. Copy of a letter from Dietrich to Treuttel, 27 September 1787.

[21] ADD 64/I/1, 215–217. Copy of a letter from Dietrich to Trebra, 8 December 1788.

at the Frankfurt and Leipzig fairs encouraged them to finance translations from French into German.

In summary, Strasbourg's particularly dynamic publishing of scientific translations in the 1780s depended on the confluence of several factors present in Strasbourg at the time, including educational, cultural, geographic, linguistic and interpersonal components that presented opportunities for synergy and individual initiatives. These factors are well illustrated by the case of Ehrmann and Lavoisier publications in the 1780s.

An example of cross-translation, revealing the conditions fuelling the publication of scientific translations in Strasbourg on the eve of the French Revolution: the works of Ehrmann and Lavoisier

During the 1780s, Strasbourg publishers, translators and scholars continually sought ways to overcome material and financial obstacles to the translation of scientific works. An example of cross-publication in Strasbourg illustrates this perfectly.

In 1786, Friedrich Ludwig Ehrmann, an experimental physics demonstrator in Strasbourg, who had already published a description of electric lamps in French and German in 1780[22] and a description of the Montgolfier brothers' aerostatic machines in German in 1784,[23] worked with Treuttel to publish a treatise entitled *Versuch einer Schmelzkunst mit Beyhülfe der Feuerluft*.[24] This treatise corroborated a series of observations also made by Lavoisier in a memoir read at the Académie des Sciences in 1783 but not published until 1785. According to Ehrmann, neither scientist was aware of the other's work at the time.[25]

In reality, Ehrmann followed Lavoisier's work with more interest than he was willing to admit to his readers. He obtained all the books published on the subject of combustion and air, and he took advantage of his connection with Dietrich, who lived in Paris in the 1780s and was close to Lavoisier, to obtain information about the instruments used by the Arsenal chemist.[26]

Recognizing the growing importance of and cross-border demand for such scientific publications, Treuttel saw a market opportunity. His "publishing strategy" (Juratic 2014:

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[22] Ehrmann, Friedrich Ludwig (1780): *Beschreibung und Gebrauch einiger elektrischer Lampen*. Strasbourg: Bauer & Treuttel; Ehrmann, Friedrich Ludwig (1780): *Description et usage de quelques lampes à air inflammable*. Strasbourg: Heitz.

[23] Ehrmann, Friedrich Ludwig (1784): *Montgolfier'sche Luftkörper oder aerostatische Maschinen*. Strasbourg: Treuttel.

[24] Ehrmann, Friedrich Ludwig (1786): *Versuch einer Schmelzkunst mit Beyhülfe der Feuerluft*. Strasbourg: Treuttel.

[25] Ehrmann, Friedrich Ludwig / Fontallard, J.-F. de (transl.) (1787). *Essai d'un art de fusion à l'aide de l'air du feu ou air vital. Followed by the memoirs of Mr. Lavoisier de l'Académie Royale des Sciences, sur le même sujet*. Strasbourg: Treuttel; Paris: Cuchet [Versuch einer Schmelzkunst mit Beyhülfe der Feuerluft, 1786, Strasbourg: Treuttel].

[26] ADD 59a/135. Letter from Ehrmann to Dietrich, 30 April 1786.

215) would be to use plates and engravings in multiple publications to maximize the returns on his investment. Having published Ehrmann's treatise in German, and seeing the crossover with Lavoisier's work, Treuttel devised a cross-translation project. He gained the support of Dietrich in Paris, which would enable him to reach Lavoisier.

At the Académie des Sciences on 29 April 1786, a committee composed of Lavoisier, Berthollet and Fourcroy examined an early manuscript of the translation of Ehrmann's *Essai d'un art de fusion à l'aide de l'air du feu ou l'air vital*. The translation had been produced by Fontallard, a maths and languages teacher working in Dietrich's office who had applied to be the German interpreter for the Academy of Sciences ; the document received the Académie's approval for publication on 23 June 1786.[27] Dietrich had already informed Ehrmann in April that his work was to be translated.[28] Ehrmann seems to acknowledge that he owes Dietrich and his allies at the Académie the honour of being published in French with the approval of the Académie des Sciences.[29]

In December 1786, the printing of the French translation was already well advanced in Strasbourg. Ehrmann and Fontallard had taken the trouble to:

[…] revise the French translation 3 or 4 times to prevent any misunderstanding, which the German technology, of which M. de Fontallard absolutely could not have had an exact knowledge everywhere, may have given rise to in several places, & he removed a good number of them.[30]

Fontallard thus appeared to oversee the literary translation from German into French, and Ehrmann, the author, of the revision of Fontallard's translation. Fontallard received 150 Livres for his work, advanced by Dietrich, who was repaid by Treuttel via a reduction of Dietrich's debt on his book supply account with Treuttel by the same amount.

In December 1786, the idea was born to enrich the volume to be published and to suggest that Ehrmann's work be supplemented by the memoirs that Lavoisier had written on the same subject. Treuttel asked Lavoisier directly for permission to reproduce them.[31] The editor from Strasbourg came up with the idea for another initiative: that of combining the translation from German into French with another from French into German. He suggested translating Lavoisier's memoirs into German, to be added to Ehrmann's German edition. The bookseller recommended to Lavoisier that Ehrmann himself do the translation:

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[27] Archives de l'Académie des sciences (AAdS) de Paris, minutes of the meeting held on 23 June 1786, f°231r-236r.

[28] ADD 59a/135. Letter from Ehrmann to Dietrich, 30 April 1786.

[29] ADD 59a/136. Letter from Ehrmann to Dietrich, 3rd January 1787.

[30] Letter from Treuttel to Lavoisier, 18 December 1786. Quoted by GOUPIL (1986: 274).

[31] *Ibid.*

He has kindly taken charge of the German translation of your above-mentioned memoirs, which I propose to give to the German Republic of Letters in the same alliance, because, knowing the difficulty, he feared that many other scholars, less versed in this special part, would have crippled the meaning.[32]

Lavoisier responded favourably to this project on 25 December 1786, and gave Fontallard the authorisation requested and the list of other memoirs that deserved to appear in the French and German volumes in preparation.[33] The famous chemist, not wishing to make any changes to his texts published in 1782 and 1783, asked Moutard, the printer of the *Académie Royale des Sciences*, if it would be possible to print 1,500 copies from the old plates or send the plates to Strasbourg, to avoid the cost of making new ones – something that from a profitability point of view would suit both the old and new printers.[34] Unfortunately, since the two Strasbourg editions in French and German were in a smaller 8° format, Treuttel was obliged to completely redraw the plates originally produced for the in-4° Moutard edition published in 1782 and 1783 (GOUPIL 1993: 9). The cost savings hoped for by Treuttel were therefore not as advantageous as expected.

In February 1787, the translation of the work was nearing completion.[35] Treuttel sent Dietrich the sheets proofread by Ehrmann, the author, who checked the work of Fontallard, his French translator. The revised version was sent to Fontallard, who centralised the dispatches.[36] Ehrmann sent back all his proofreading on 15 April 1787 via the bookseller Treuttel.[37] But the question of two large copper engravings continued to stall: Treuttel feared that the costs of the enterprise would increase if Lavoisier did not provide him with copies taken from the Paris engraving.[38]

Lavoisier's three memoirs and Meusnier's paper on high-temperature fusion were published in German in 1787 under the title *Abhandlungen über die Wirkung des durch die Lebensluft verstärkten Feuers*. Ehrmann wrote a foreword and notes. He states on the front cover that this volume of translations of Lavoisier's works serves "als ein Anhang zu seinem *Versuche einer Schmelzkunst mit Beyhülfe der Feuerluft*", i.e., as a counterpart to his own work,[39] thereby using Lavoisier's translation to promote his work. However, such cross-referencing also served to reinforce modern chemistry in Europe – by promoting a new author outside the Arsenal group (Ehrmann) among

[32] *Ibid.*

[33] Letter from Lavoisier to Treuttel, 25 December 1786. Quoted by Goupil 1986: 276.

[34] Letter from Lavoisier to Moutard, late 1786. Quoted by Goupil 1986: 277.

[35] ADD 62/358. Letter from Treuttel to Dietrich, 22 February 1787.

[36] ADD 59a/143. Letter from Fontallard to Dietrich, October 1786.

[37] ADD 62/154. Letter from Ehrmann to Dietrich, 20 April 1787.

[38] *Ibid.*

[39] LAVOISIER, Antoine Laurent de / EHRMANN, Friedrich Ludwig (transl.) (1787): *Abhandlungen über die Wirkung des durch die Lebensluft verstärkten Feuers*. Strasbourg: Treuttel.

francophone audiences, while disseminating Lavoisier's work more widely to germanephone readers.

Indeed, before 1789–1790, according to Andreas Kleinert, Lavoisier's theory "was not yet considered a real alternative to Stahl's" (KLEINERT 1995: 192). Although his ideas were already known in the German-speaking world thanks to Christian Ehrenfried Weigel's 1783 German translation of *Opuscules physiques et chymiques* and Crell's *Chemische Annalen,* which had been regularly reporting on Lavoisier's experiments since January 1784. But it was only thanks to the *Traité élémentaire de chimie* and the endorsement of its contents by the *Hofapotheker* Sigismund Friedrich Hermbstaedt, renowned for the quality of his publications, reviews and translations of works by Lavoisier, Scheele and Chaptal, that Lavoisier's theories began to be accepted in the German-speaking world by 1789 (KLEINERT 1995: 192). The double translation of Ehrmann's and Lavoisier's work, in 1786–1787, also attempted to contribute to the transfer of the ideas of modern chemistry across the Rhine. Treuttel, who no doubt hoped to have German versions of Lavoisier's texts to exchange with his German colleagues at the annual fairs, also offered to translate the *Traité élémentaire de chimie* in January 1789. Lavoisier accepted the Strasbourg bookseller's proposal and sent Treuttel, via Dietrich, a copy from which to begin the translation work.[40]

The exchanges between Treuttel, Lavoisier, Dietrich, Ehrmann and Fontallard reveal some of the conditions for the realisation of a translation publication project benefiting from Strasbourg's publishing ecosystem. One of the first conditions seems to be the importance of pre-existing interpersonal relationships: Treuttel published a translation of *Ferber's Lettres sur la minéralogie de l'Italie* initially published by Dietrich in Strasbourg in 1776,[41] and he served as Dietrich's Strasbourg-based connection to the German books he needed; Dietrich had the confidence of Lavoisier, who had supported his candidacy for the *Académie des Sciences* in 1786; Fontallard was part of Dietrich's secretariat in Paris and had already worked for him on several translations from German into French; Ehrmann was one of Dietrich's correspondents and had the same publisher in Strasbourg as Dietrich. The second condition seems to be the ability to assemble a team of authors, translators, and expert proofreaders capable of ensuring the quality of the translated work. But the ultimate condition is undoubtedly the alignment of a project with the realities of market demand, whether institutional or commercial. Without the prospect of being able to present himself in Leipzig or Frankfurt with the German version of Lavoisier's works, to be exchanged for numerous German titles that he would then sell to his clients in Strasbourg, Treuttel would not have risked such a costly venture.

In fact, this strong hub of activity and relationships around modern chemistry led the *Annales* team to seriously consider moving the printing of the journal to Strasbourg,

[40] ADD 64/I/1, 260. Copy of a letter from Dietrich to Treuttel, 27 January 1789.

[41] FERBER, Johann Jakob / DIETRICH, Philippe Frédéric (de) (transl.) (1776): *Lettres sur la minéralogie de l'Italie*. Strasbourg: Bauer & Treuttel [*Briefe aus Wälschland über natürliche Merkwürdigkeiten dieses Landes an den Herausgeber derselben Ignatz Edler von Born*, 1773. Prague: Gerle].

which would have allowed them to avoid the overburdened printing sector in Paris.[42] While this plan was never realized, this vision is testament to Strasbourg's strong reputation for producing high-quality scientific publications and translations in the late 1780s.

Conclusion

As a provincial city with 23 translations of scientific publications in the 1780s alone, Strasbourg's role in publishing deserves to be reassessed and contextualised.

The links between publishing and the city's Protestant University, thanks in particular to the dynamism of the Faculty of Medicine, provided fertile ground for publishers seeking to develop their scientific catalogues. Medical publications continued to dominate, but by the 1780s, natural history, mineralogy and chemistry were increasingly prominent. In the 18th century, the role of the university as the driving force in scientific publications was still felt but was no longer exclusive.

Three Strasbourg publishers in particular – König, La Librairie Académique and Treuttel – were proactive in the publishing of scientific works and translations, thanks to emerging cross-border market opportunities. Publishers favored translations into German because this enabled them to break out of the chronic narrowness of Strasbourg's editorial output, and supplied them with works to exchange with their German colleagues at fairs. By investing in translations, publishers found they could earn profits in Germanophone markets and procure other German-language books to sell in Strasbourg.

It is therefore a set of material and cultural parameters that determined the logics of the protagonists in the publishing world, far from the sole explanation of Strasbourg's geographical and linguistic location, whose literate, bilingual inhabitants would be natural go-betweens between German-speaking and French-speaking populations. On the other hand, it is true that the bilingualism of the scholarly elite did help produce competent translators, capable of mastering the "third language" of translation, as well as the scientific lexicon. Moreover, Strasbourg's geographic position at both the North-South and East-West crossroads of Europe helped to facilitate encounters and foster relationships between travelling authors, local scholars, and publishers. These interpersonal relationships played a critical role in the decisions, logistics and financing related to translating and publishing scientific works.

French aerostatic experiments and the development of modern chemistry in France, among other subjects, provided Strasbourg booksellers with a particularly large number of titles to translate into German in the 1780s. But personal initiative, networks activated and enriched by translation series, and opportunities to make cross-translations profitable also accounted for translations from other source languages into other target languages. In this respect, Strasbourg publishing also adapted to the new multicultural logic of a transnational scientific community that needed fast, high-

[42] ADD 64/I/1, 349. Copy of a letter from Dietrich to Berthollet, Strasbourg, 26 December 1789: "I had spoken to several of our booksellers to find out how much it would cost per volume to have the *Annales* printed here. They estimated the cost at 40 Livres per sheet, which comes to 800 Livres per volume, printed in twelve hundred copies. I had also secured a good proof-reader."

quality translations. In contact with experts who mastered two of the three languages of the triumvirate of vernacular languages that dominated scientific production in Europe after the decline of Latin, Strasbourg played an important role in decompartmentalising and diffusing French and German scientific research.

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AA 2350 to 2361 and AA 2658. Police regulations for bookshops in Strasbourg.

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Appendix 1: The twenty-three translations published in Strasbourg in the 1780s

Authors	Source langage	Target Langage	Title	Publisher and year of publication	Translator, if known
?	French	German	*Die vollkommene Krankenwärterinn oder Unterricht wie kranke Personen gut zu pflegen und abzuwarten sind*	König, 1787	Johann Gottfried Pfähler
Balfour Francis	English	German	*Über den Einfluß des Mondes auf die Fieber*	Librairie académique, 1786	G. T. Wenzel
Bloch Marcus Elieser	German	French	*Traité de la génération des vers des intestins et des vermifuges*	Treuttel, 1788	Lassonne ?
Bond Thomas	English	French	*Défense de l'inoculation, et relation des progrès qu'elle a faits à Philadelphie en 1758*	Librairie académique, 1784	?
Bonn Andreas	Dutch	German	*Über eine seltene und widernatürliche Beschaffenheit der Harnblase und Geburtstheile eines zwölfjährigen Knabens*	?, 1782	Heinrich Joseph Arntz
Brunner Emanuel Alexander Ludovicus	Latin	German	*Vom Staar und dessen Heilverfahren, der Niederdruckung sowohl als Ausziehung*	Librairie académique, 1788	D. G. Ziegenhagen, a sworn doctor, who said he had "freely adapted"
Carrère Joseph-Barthélemy-François	French	German	*Handbuch zur Krankenpflege*	Treuttel, 1787	?
Ehrmann Friedrich Ludwig	German	French	*Essai d'un art de fusion à l'aide de l'air du feu ou air vital*	Treuttel, 1787	Friedrich Ludwig Ehrmann
Howard	English	French	*Lettres d'un voyageur sur les causes de la structure actuelle de la terre*	Levrault, 1786	Father Collot de Ramberville
Lavoisier Antoine Laurent (de)	French	German	*Abhandlungen Ueber die Wirkung des durch die Lebensluft verstärkten Feuers*	Treuttel, 1787	Friedrich Ludwig Ehrmann
Euler Leonhard	Latin	French	*Introduction à l'analyse des infiniment petits*	Librairie académique, 1786	Pezzi
Faujas de Saint-Fond Barthélemy	French	German	*Physikalische Abhandlung über den Trapp*	Librairie académique, 1789	?
Hamilton William	French	German	*Schreiben des Ritters von Hamilton an die königliche Societät der Wissenschaften in London*	Librairie académique, 1784	Indirect transl., from the French version

Martinet Jean Florent	French	German	*Neue Erfahrungen über die Eigenschaften des flüchtig-flüßigen Alkali*	König, 1789	"DELG", resident of Karlsruhe
Percy Pierre François	French	German	*Vom Ausziehen fremder Körper aus Schußwunden*	Librairie académique, 1789	Thomas Lauth
Poupart Pierre	French	German	*Abhandlung von den Flechten*	König, 1784	Johannes Conrad
Raff Georg Christian	German	French	*Abrégé D'Histoire Naturelle Pour L'Instruction De La Jeunesse*	Dannbach, 1786	Claude Perraut, having "Imitated German."
Ramond de Carbonnières Louis-François	French	German	*Reise nach den höchsten französischen und spanischen Pyrenäen, oder physikalische, geologische und moralische Beschreibung der Pyrenäen*	Librairie académique, 1789	Translated from the French "under the supervision of the author."
Schurer Jakob Ludwig	German	French	*Élémens De Physique*	Librairie académique, 1786	
Spallanzani Lazzaro	Italian	German	*Physikalische Beobachtungen auf der Insel Cythera, heutzutage Cerigo genannt*	Librairie académique, 1789	?
Spielmann Jacob Reinbold	Latin	German	*Anleitung zur Kenntniß der Arzneymittel*	Treuttel, 1785	Johann Jacob Spielmann, the author's son
Thomassin Michel	French	German	*Abhandlung über das Herausziehen fremder Körper aus Wunden*	Treuttel, 1788	?
Voigt Johann Carl Wilhelm	German	French	*Nouvelles lettres sur les montagnes*	Librairie académique, 1787	Jean-François de Fontallard

Appendix 2: Scientific publications and translations published in Frankfurt and Mainz in the 1780s

City: Frankfurt amMain	Scientific publications	Including translations
49 science books, 10 of which were co-published in Frankfurt and Leipzig (although these are sometimes indicated to conceal other places of publication, such as Nüremberg or Gießen) and 5 co-published in Frankfurt and Mainz.	Mathematics and physics: 6	Boerhaave, H. (1781). *Briefe an Johann Baptist Bassand*. Bauer. Breislak, S. & Barral, P. & Dolomieu, D. (de) (1789). *Beiträge zur Mineralogie von Italien*. Varrentrapp und Wenner. Carrère, J. B. F. (1789). *Untersuchungen über die verlarvten, ausgearteten oder verwickelten venerisch-chronischen Krankheiten*. Fleischer. Monro, A. (1789). *Abhandlungen von anatomischen Einspritzungen und Aufbewahrung anatomischer Präparate*. Jäger. Rollo, J. & Hendy, J. (1788). *Über die Drüsenkrankheit in Barbados oder über Willhelm Hillary's Elephantiasis*. Andreae. Sonnerat, P. (1784). *Reise nach Ostindien und Ssina*. Schneider. Tissot, S. (1782–1784). *Abhandlung über die Nerven und deren Krankheiten*.
	Medicine: 14	
	Botany and agriculture: 7	
	Natural history and mineralogy: 17	
	Chemistry and metallurgy: 5	

City: Mainz	Scientific publications	Including translations
17 science books, including 5 co-published in Mainz and Frankfurt.	Mathematics and physics: 3	Breislak, S. & Barral, P. & Dolomieu, D. (de) (1789). *Beiträge zur Mineralogie von Italien*. Varrentrapp und Wenner.
	Medicine: 5	
	Botany and agriculture: 1	
	Natural history and mineralogy: 8	
	Chemistry and metallurgy: 0	