

# Editors, librarians, and publication exchange: The Royal Swedish Academy of Sciences in the long 19th century

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## Funding information

Marianne and Marcus Wallenberg Foundation

## SPECIAL ISSUE

Editorship and the Editing of Scientific  
Journals, 1750–1950

## GUEST EDITORS

Anna Gielas and Aileen Fyfe

This Special Issue was selected by a dedicated  
ESHS committee after a public call for special  
issues.

## Abstract

The paper discusses the publications of the Royal Swedish Academy of Sciences (RSAS) as part of a wider network of publication exchange, linking learned societies, libraries, and archives. The periodicals of the RSAS went through several reorganisations between 1813 and 1903, all to some extent related to their role in publication exchange. Although subject to many of the same deliberations of commercial value and institutional prestige as the expanding book trade, publication exchange offered a means of communication for institutions with widely differing financial, linguistic and scientific status, and a forum for articulating a wide range of values significant in scientific publication. In the context of publication exchange, the roles of producers and consumers, and of publishers and repositories of scientific knowledge overlap, and librarians emerge alongside editors as central actors in scientific communication. Scientific editorship should be viewed not only as a means of disseminating scientific findings to wider audiences, but as designing a product that could be used to forge institutional connections, to acquire publications, and to build collections. The case of the RSAS periodicals highlights the importance of publication, not only for the distribution of scientific knowledge, but for its acquisition.

## KEYWORDS

scientific periodicals, Royal Swedish Academy of Sciences,  
publication exchange, scientific publication

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In 1837, the Royal Swedish Academy of Sciences in Stockholm received a request for publication exchange from the Geographical Institute in Brussels. In exchange for its publications—the venerable *Transactions of the Royal Swedish Academy of Sciences* and the more recent *Annual Survey of Progress in the Sciences*—the Academy would receive those of the Geographical Institute, including an atlas of 400 plates in six volumes, with an estimated value of 520 francs. At the recommendation of the library, which lacked a recent atlas, the Academy approved the request.<sup>1</sup>

In this paper, I discuss publication exchange at the Royal Swedish Academy of Sciences (RSAS) during the 19th century. The Brussels Geographical Institute was merely one in a steadily increasing number of institutions with which the RSAS exchanged publications, and the atlas incident draws particular attention to the importance of publication as a means of acquisition. The RSAS was part of a wide network of publication exchange, linking learned societies, libraries, and archives, where the roles of producers and consumers, and of publishers and repositories of scientific knowledge overlapped. In this context, librarians emerged alongside editors as central actors in scientific communication, and editorship should be viewed, not only as a means of disseminating scientific findings to wider audiences, but as designing a product that could be used to forge institutional connections, to acquire publications, and to build collections.

## 1 | PUBLICATIONS: GIFTS, EXCHANGES, TRANSACTIONS

“Exchange” is one of several terms used by editors, authors, librarians, and publishers during the 19th century to describe the reciprocal dispatch and acquisition of publications. In use from at least the middle of the 18th century, it emerged as one of the most common terms in the course of the 19th, appearing in formal as well as informal contexts in several languages.<sup>2</sup> In a German context, a prominent example is the Akademischer Tauschverein, founded in 1817 to organise the exchange of publications between German universities.<sup>3</sup> The activities of Alexandre Vattemar in the 1830s, and eventually the U.S. Congress and the Smithsonian Institution, to formalise the “exchange” of scientific and official publications between the United States and Europe, are well documented.<sup>4</sup> *Skriftbyte* is the term that appears in the minutes of the RSAS, whereas *échange* is used in its foreign correspondence, which was primarily conducted in French. Thus, the Royal Academy of Sciences in Madrid, the Geological Society of London, and the Physical Observatory in St. Petersburg enthusiastically entered into relations of “*échange mutuelle*” with the RSAS in the 1850s.<sup>5</sup> “Exchange” eventually came to represent an entire system of distributing and acquiring publications between libraries, government offices, and learned societies of many kinds.<sup>6</sup>

From an analytical perspective, “exchange” resembles, at one end, the kind of reciprocal gift-giving described by Marcel Mauss, and more specifically in the context of scientific publication, by Warren Hagstrom.<sup>7</sup> Indeed, activities and relationships which some institutions refer to as “exchange” are sometimes described by others as “gifts” and “donations.”<sup>8</sup> However, the donations typically follow a Maussian pattern with a clear, sometimes stated, expectation of return gifts.<sup>9</sup> In his study of academic publication as gift-giving, Hagstrom discusses how scientific papers are

<sup>1</sup>Minutes of the Royal Swedish Academy of Sciences (1837, Oct. 11), Archives of the Royal Swedish Academy of Sciences, Stockholm, Sweden (hereafter Archives of the RSAS).

<sup>2</sup>On the early history of publication exchange, see Bring (1921); Lilja (2006).

<sup>3</sup>Bring (1921, p. 441); Lilja (2006, p. 52).

<sup>4</sup>Most recently and comprehensively by Gwinn (2010), based on her unpublished dissertation.

<sup>5</sup>Letter (preprinted) from Mariano Lorente, Académie Royale des Sciences, Madrid, to the RSAS (1855, Sept. 30); Letter from John Carrick Moore, Geological Society, to the RSAS (1852, Feb. 11); Letter from A. Kupffer, Physical Observatory of St. Petersburg, to the RSAS (1849, Dec. 5); all in KVA, KVAB:s korrespondens 1832–1869, E1:1, Archives of the RSAS.

<sup>6</sup>Bring (1921); Lilja (2006); also Einhorn (1972); Gibson (1982).

<sup>7</sup>Mauss (1925/2002); Hagstrom (1982).

<sup>8</sup>Notably by the Royal Society of London; see Fyfe (2015).

<sup>9</sup>See e.g., the (preprinted) letter from Joseph Henry to the RSAS on June 21, 1852, where he describes the works recently shipped to Stockholm as “presents,” and “in return” desires “as full series as possible” of any works of a scientific or literary nature: KVA, KVAB:s korrespondens 1832–1869, E1:1, Archives of the RSAS.

exchanged for recognition between individual researchers and the scientific community. At the other end of the spectrum, Hagstrom contrasts the exchange of gifts between authors and the scientific community with “barter or contractual exchange.” The different terms highlight that the reciprocal relationships in scientific publication involve a complicated negotiation of values, sometimes overt, sometimes implicit.

In contrast to Hagstrom, I focus on the publishing *institutions*—commercial, academic, or government—involved in mediating this exchange. My interest is in the exchange between these institutions, and how publications as well as institutional relationships are calibrated via exchange.<sup>10</sup> Institutional seniority and the prestige of the publishing institutions, the reputations of individual authors and the content of their papers, the rarity and extravagance of particular publications, the prestige of the relationships themselves—all are significant for the shaping of publication exchange.

The exchange of publications, with its sliding scale from donations to transactions, resembles the circulation of other kinds of scientific specimens between individuals, institutions, and brokers. Parallel to the dynamic commercial markets for collections in areas such as natural history, art, and archaeology, specimens were donated and exchanged between collectors and institutions in these fields, seeking to expand their collections and strengthen institutional ties. In natural history, collectors formulated highly formalised exchange systems, with detailed policies for evaluating specimens according to quality, rarity, difficulty of acquisition, and other characteristics specific to the respective fields.<sup>11</sup>

Recent scholarship on the history of scientific publication has examined the emergence of the genre and format of a new generation of scientific journals in the first half of the 19th century. Jonathan Topham has emphasised the eclectic, “anthologising” character of many early periodicals, where translations, reprints, and summaries were prominent, sometimes dominant, features, and the dissemination of previously published works was a major objective.<sup>12</sup> Recycling, as well as circulation, was crucial to scientific communication, and access to scientific publications was a prerequisite for printers and editors as well as for authors. Alex Csiszar and Iain Watts have each discussed the complex relations between institutional and commercial publishers of scientific journals in France and Britain, showing how the negotiation of the public sphere and the costs of communication shaped publications inside and outside the scientific community, particularly the format of the scientific journal.<sup>13</sup> Periodical “proceedings,” with features recalling those of commercial journals, were often added to the older “memoirs” and “transactions” published by learned societies. Further, even as scientific genres multiplied with the rapid expansion of publishing, there were trends towards convergence.<sup>14</sup>

But although learned societies were increasingly concerned about the costs of publication, and anxious to make their products attractive on the book market, a large proportion—in some cases, the vast majority—of their publications were distributed via exchange, rather than sale or subscription.<sup>15</sup> The increasingly formalised system of publication exchange suggests that these exchange relationships were an important factor in negotiations of genre and status. Perhaps more importantly, they seem to have operated across different national environments for scientific publication—in terms of markets, regulations, and publics—placing the particular developments in Britain, France, and Germany in a broader context.<sup>16</sup> In many ways, publication exchange overlapped with the commercial book trade and was by no means impervious to its pressures; nevertheless, it offered a means of communication for institutions with widely differing financial, linguistic, and scientific status.<sup>17</sup>

However, the particular history of publication exchange is surprisingly unexplored. The exchange of publications between libraries has been touched on briefly by library historians, and most comprehensively discussed by Nancy

<sup>10</sup>Cf. the discussion of multiple meanings of “value,” academic and otherwise, in the sociology of valuation: Lamont (2012).

<sup>11</sup>On specimen exchange in botany, see Beckman (2011).

<sup>12</sup>Topham (2011; 2013); Watts (2014). Specifically on the translation and re-publication of British texts in French, see Bickerton (1986).

<sup>13</sup>Csiszar (2018); Watts (2014).

<sup>14</sup>Csiszar (2018, esp. Ch. 5).

<sup>15</sup>Cf. Fyfe (2015).

<sup>16</sup>Cf. Secord (2004); Raj (2013).

<sup>17</sup>See e.g., Gwinn (2010), on the political and economic motivations for the Smithsonian Library exchange in the 19th century.

Gwinn in her work on the Smithsonian Library exchange.<sup>18</sup> But exchange networks involved a great number of institutions besides libraries. The RSAS was one of the main hubs of Swedish publication exchange for more than two centuries from its foundation in 1739; it was both a key actor in, and an important example of, international publication exchange.<sup>19</sup>

I want to explore the values and particularities of publication exchange relationships, and argue that that these are crucial to our understanding of the history of scientific communication.<sup>20</sup> In this paper, my particular focus is narrower: the way exchange contributed to shaping the form and content of the publications of the RSAS. The RSAS periodicals went through several reorganisations between 1813 and 1903, all motivated by or connected to their role in publication exchange. In this development, library officials were arguably as influential in shaping its publications as authors, editors, and editorial boards.

After a brief outline of the establishment of publication exchange in the early years of the RSAS in the 18th century, I turn to the exchange practices and publication reforms of the 19th century. The reign of Jöns Jacob Berzelius as Permanent Secretary of the RSAS and editor of its publications (1818–1848) spans a shift in editorial practices, both in terms of organisation and of the importance of the reputation of the editor himself. After his death, the library emerged fully as a central actor in scientific publication as well as acquisition.

## 2 | ESTABLISHING EXCHANGE AT THE ROYAL SWEDISH ACADEMY OF SCIENCES

From the first days of the Royal Swedish Academy of Sciences, publication exchange was an important part of its activities. It was a means of establishing contact, and aspiring to parity, with other more venerable learned societies, and of making Swedish science known outside the country by distributing its own *Transactions*. Publications received in exchange were also used to expand the Academy library, and alongside commercial purchases, non-commercial acquisition of publications remained central to the RSAS well into the 20th century.

When the RSAS was founded in 1739, publications were the core of the enterprise, ideologically, organisationally, and economically.<sup>21</sup> In the preface to the very first edition of the *Transactions of the Royal Swedish Academy of Sciences* (*Kungl. Vetenskapsakademiens Handlingar*) in 1739, Anders Johan von Höpken, one of the six founders, emphasised that the sciences must be saved from the “impermanence” that they were subjected to as long as they were “hidden and protected by the few,” and that instead, they must be distributed among the many in order to be of “public use, education, and service.”<sup>22</sup> Consequently, the collection of this hidden knowledge—via correspondence—and the distribution of it for public use—via the *Transactions*—were the primary activities of the Academy. In line with the publications of many other learned societies, the *Transactions* were published in the vernacular rather than Latin, to increase their domestic usefulness. The organisation of the Academy was closely tied to publication. Of the principal officers of the Academy, the Permanent Secretary provided for documentation and correspondence, as well as long-term continuity as the title suggests, whereas the President had a 3-month appointment coordinated with the quarterly appearance of the *Transactions*, to ensure that the publication pace was maintained.<sup>23</sup>

<sup>18</sup>Gwinn (2010), based on her unpublished dissertation; Bring (1921; 1929); Lilja (2006); Gibson (1982); Einhorn (1972).

<sup>19</sup>On Swedish exchange relations in general, see Bring (1921). A long-term perspective on publication exchange at the RSAS is given in the preparations for the cessation of publication exchange in the 1970s: see Odelberg, W., Fredga, A. & Myrbäck, K. (1968), “Vetenskapsakademiens publikationsverksamhet: Redogörelse och principförslag,” Bihang till förvaltningsutskottets protokoll, Archives of the RSAS; Hallberg & Hakulinen (1968).

<sup>20</sup>It may also serve as an interesting counterpoint to our current publication landscape, following Aileen Fyfe's assertion that the recent focus on the commercial aspects of publication practices has been too strong; Fyfe et al. (2017).

<sup>21</sup>Lindroth (1967); Hildebrand (1939); Holmberg (1958); Björck & Kaiserfeld (2018). For an overview of the history of the RSAS in English, see Frängsmyr (1989).

<sup>22</sup>Höpken (1739, p. 5).

<sup>23</sup>Lindroth (1967, Vol. 1, p. 36); Hildebrand (1939, pp. 434–435). A brief discussion of the RSAS as one of many learned societies that were founded in the 18th century and published in the vernacular is in McClellan (1985, Ch. 3).

Both publication and correspondence were expensive, and the Academy initially depended heavily on the good will and funding of some of its wealthier fellows.<sup>24</sup> Within a decade, the Academy achieved a more secure financial basis for its efforts in the circulation of knowledge. In 1747 it expanded its publishing repertoire, assuming the responsibility—and the exclusive privilege—of printing and selling almanacs. Almanacs were among the very few profitable products in the Swedish book market, and the state-sanctioned monopoly on publishing almanacs ensured a large and dependable income until 1774, providing the foundation for RSAS activities, including publications. They were also a means of dispensing useful information even more widely among the population via the customary essays on topics of general interest, such as tea, brewing, and popular remedies.<sup>25</sup>

In 1745, the Academy was also granted franking privileges for domestic letters, journals, and packages, and within a few years they were extended to foreign correspondence.<sup>26</sup> In contrast to most institutions with similar privileges, the Academy was exempted from postage for consignments received as well as dispatched, including correspondents as well as fellows. Thus, the Academy's franking privileges facilitated not only the distribution of knowledge, but also its acquisition, since scientific findings and news could be sent to the Academy from anywhere in the country without postage. From the practical perspective of postal administration, collecting knowledge was the mirror image of distributing it.

Alongside collecting knowledge through correspondence, the Academy began building a library. The collections grew through purchases, subscriptions, and donations, often funded by prominent Academy fellows, and increasingly through exchange. Similar systems for the distribution and acquisition of publications were in operation close at hand. Swedish universities—dispersed across the remnants of the Swedish empire from Åbo on the Finnish coast to Greifswald in Pomerania—had established a formal system of publication exchange, a “*commercium litterarium*,” in 1745, sending dissertations and academic programmes across the Baltic. Publications were distributed in proportion to the number of professors, revealing the system's basis in the networks and collections of individual academics, but the activity was gradually transferred to the university librarians.<sup>27</sup>

The fledgling Academy was anxious to establish relations with academies and learned societies in other countries. Early attempts to enter into exchange relations with the Royal Society of London (of which co-founder Mårten Triewald was a fellow) and the academies of Paris and St. Petersburg were fruitless, despite the dispatch of the new *Transactions of the Royal Swedish Academy of Sciences* to all these institutions. However, within a few years, and with the rising reputation of the RSAS and its *Transactions*, formal exchange relationships were established with these, as well as with several other learned societies in Europe.<sup>28</sup> The exchange partnerships of the Academy were greatly expanded under the reign of Pehr Wilhelm Wargentin as Permanent Secretary from 1749 to 1783. A prominent astronomer, he prided himself of having engaged his own vast correspondence network in the service of the Academy, dispatching Academy periodicals as well as various Swedish scientific publications across Europe and receiving mémoires, transactions, acta, and *Berichte* in return. “An academy of science with no correspondence surely has no life.”<sup>29</sup>

With Wargentin, the Permanent Secretary emerged as the principal manager of Academy publications, even though the office of the President had been partially designed to match the schedule of the *Transactions*. After Wargentin's death, the power of the Secretary developed into a problem rather than an advantage. Subsequent

<sup>24</sup>Lindroth (1967, Vol. 1, pp. 102–103).

<sup>25</sup>On the almanac monopoly, see Lindroth (1967, Vol. 1, pp. 823–867). The almanac monopoly was abolished in 1774.

<sup>26</sup>Lindroth (1967, Vol. 1, pp. 46–48). In recognition, the Director-General of the Post Office, Leonard von Klinkowström, was elected a fellow of the Academy in 1750; see Beckman (2018, p. 391). Swedish franking privileges were granted by royal sanction, rather than through connections with noble families; cf. Csiszar (2018, p. 202).

<sup>27</sup>On Swedish library exchange, see Bring (1921; 1929). For a broader international perspective, see Lilja (2006); Einhorn (1972). American publication exchange is examined in Gwinn (2010).

<sup>28</sup>Lindroth (1967, vol. 1, pp. 181–208). See e.g., Minutes of the Royal Swedish Academy of Sciences (1750, Oct. 6), Archives of the RSAS; detailing the successful request for exchange with the Académie royale des sciences in Paris, managed through the offices of the Swedish “Minister” (ambassador) Scheffer and the fellows of the Académie de l'Isle. The RSAS corresponded with the Philosophical Society in Philadelphia and with the American Academy of Arts and Sciences in Boston, but there were no formal exchange partnerships during the 18th century. Lindroth (1967, Vol. 1, pp. 206–207).

<sup>29</sup>Wargentin (1903, p. 166).

incumbents were less interested in correspondence and the *Transactions*, and the rate of publication slowed down. Half-hearted management and rigid regulations—article length, language, review processes—irritated authors. Similar problems plagued many scientific publications in the period, but the particular editorial negligence of RSAS secretaries around 1800 mirrored a general decline in Swedish science, and the loss of royal support.<sup>30</sup> To make matters worse, the turbulent political situation hindered correspondence across borders.<sup>31</sup>

### 3 | BERZELIUS'S ANNUAL SURVEY—THE IMPORTANCE OF ACQUISITION

The publications of the Academy underwent substantial changes in the 1810s and 1820s, most of them at the instigation of Jacob Berzelius (1779–1848). His first attempt to publish a paper in the *Transactions* in 1801, as a young scholar fresh from university, had been thwarted by the tardiness and lack of interest of the deputy Permanent Secretary at the time, Carl Gustaf Sjösten. When Berzelius was himself elected fellow of the RSAS in 1808, and eventually Permanent Secretary in 1818, he had acquired extensive editorial experience elsewhere. He used his growing scientific reputation as an experimentalist to effect several reforms of the *Transactions* from 1813 onwards, threatening to take his publications elsewhere if the RSAS did not make the journal a more attractive vehicle for scientific publication. As Permanent Secretary, he instituted an editorial board and further amended the regulations and publication pace of the *Transactions*.<sup>32</sup>

Berzelius's own reputation as a chemist was crucial in re-establishing the status of RSAS publications for readers and for other scientific institutions. This was especially the case with the new *Annual Survey of Progress in the Sciences* (*Årsberättelser om vetenskapernas framsteg*), started by Berzelius in 1821. Essentially a review of recent research, the *Annual Survey* depended on a steady supply of scientific publications to the RSAS, and could, in turn, be used in exchange to acquire further publications. Perhaps more strikingly than many contemporary scientific periodicals, the *Annual Survey* embodied the reciprocal aspects of publication.

In the *Survey*—ostensibly conceived as a sort of annual appendix to Berzelius's own successful chemical *Textbook*—Berzelius recounted and reviewed the scientific findings of the past year across the world, based on other publications. In the 1820s, Berzelius was at the height of his scientific fame and his judgement was widely respected. The *Annual Survey* was immediately translated into German, and for almost two decades, Berzelius's pronouncements on scientific results, publications, and prizes were highly valued, almost as highly as the prizes and publications themselves.<sup>33</sup>

Berzelius also required his Academy colleagues (the curators of botany and zoology, the astronomer, and the lecturer in technology) to compile similar surveys of their respective fields. He was not always successful: the curator of botany was often ill, and the lecturer in technology consistently failed to turn in his accounts on time, and was ultimately dismissed (if not primarily for that reason).<sup>34</sup> Others were more conscientious but still frequently late, and Berzelius eventually introduced a new regulation that stipulated that a portion of their Academy salaries would be withheld until they delivered their surveys.<sup>35</sup>

But the *Survey* authors could have quite legitimate reasons for their tardiness. An undertaking such as the *Annual Survey* depended on a reliable supply of scientific news from abroad. Although the Napoleonic Wars were over, the

<sup>30</sup>In the decades following Wargentin's death, the RSAS was managed by six different Permanent Secretaries in quick succession, and although publication regulations and exchange relationships remained the same, the speed and diligence of RSAS management declined. Cf. Beckman (2016). On the decline of the RSAS, see Lindroth (1967, Vol. 2, esp. pp. 1–8).

<sup>31</sup>Topham (2011); Bickerton (1986).

<sup>32</sup>I have discussed Berzelius's editorial career before and after his election to the RSAS and his publication reforms and strategies in more detail in Beckman (2016).

<sup>33</sup>On the status and eventual decline of the *Annual Survey* as an arbiter of chemical excellence, see Beckman (2019). On Berzelius's influence in scientific debates in the 1820s and 1830s, see Rocke (1984) and Melhado (1981).

<sup>34</sup>On Berzelius's conflict with the lecturer in technology, Schwartz, see Torstendahl (2000). On the illnesses of the curator of botany, Johan Emanuel Wikström, see Eriksson (1991).

<sup>35</sup>The practice began in the 1820s but was formally added to the Instructions for RSAS officials in 1843: Minutes of the Royal Swedish Academy of Sciences (1843, May 10), Archives of the RSAS.

political situation in continental Europe was still unstable, and postal services were costly and sometimes unreliable. Berzelius's attempts to force his colleagues to complete the *Annual Surveys* on time were often frustrated by war, weather, or the contrariness of the postal authorities, who periodically refused to honour the franking privileges of the Academy. The *Annual Survey* of 1832, for example, suffered serious delays caused neither by the illness of the curator of botany nor the recalcitrance of the lecturer in technology, but by the Hamburg customs, who refused to release a large consignment of scientific journals on their way to Stockholm. Despite several appeals to the Swedish envoy, the General Post Office, and the Customs Commission, the journals remained in Hamburg for months. This time, the curators suffered no salary reductions.<sup>36</sup>

In the case of the *Annual Survey*, the personal reputation and dedication of the editor was of crucial importance for its success. It relied heavily on Berzelius's own reputation and network for its impact, dissemination, and translation. In addition, its influence boosted that of the RSAS as its publishing institution. In this sense, it may be regarded as a particularly clear embodiment of the advantages of editorship that Berzelius had sought earlier in his career: granting access to costly publications, as well as the means to publish and distribute scientific results. At the same time, the frequent delays, postal as well as political, highlight the practical problems of publication exchange, while the recalcitrance of Berzelius's colleagues demonstrates the dangers of depending on personal networks or on the clout of a particular author or editor.

## 4 | CALIBRATING EXCHANGE VALUE

The exchange relationships established during Wargentin's reign as Permanent Secretary were further strengthened during the 19th century. Although exchange agreements were desirable in themselves, evaluations of the publications exchanged were made increasingly explicit, if not always in economic terms. Calculations of exchange value involved the age, status, and reliability of the institutions involved, as well as the rarity, relevance, price, and prestige of their publications, specifically measured against the number of publications and back issues the RSAS might offer in return. The possibilities for exchange also increased, as the RSAS added several new periodicals to its repertoire. The rapid increase in exchange relationships at the RSAS reflected the expansion of scientific publication in general, as well as the formalisation of publication exchange and the status of the RSAS itself, recently boosted by the fame and publication reforms of Berzelius. Among 19th-century learned societies, the RSAS was a respectable exchange partner, if not as illustrious as in its heyday in the 18th century, when it had counted Linnaeus and Wargentin among its fellows and its *Transactions* were regularly translated into other languages.<sup>37</sup>

The parallel commercial and exchange values of RSAS publications were embodied in the contracts with its printers. From 1823, the publications were printed by the company Norstedt & Söner. The printers leased the right to print and sell almanacs—still very profitable—and the contract required them to print all other Academy publications and deliver a set number of copies to the RSAS. The RSAS copies were primarily used for exchange, donations, and distribution to Academy fellows. The contract provided a reliable income for the RSAS, but left Norstedt & Söner free to print and sell additional copies themselves.<sup>38</sup>

Under Berzelius, the *Annual Survey* was soon included in the Academy's exchange and used to spread its reputation, as well as to gain exchange partners.<sup>39</sup> Exchange was increasingly discussed as a formal relationship between

<sup>36</sup>In March 1832, Berzelius announced to the RSAS that journals necessary for the completion of the *Annual Survey* had been detained in Hamburg since July 1831. The situation had not been satisfactorily resolved by the end of the year: Minutes of the Royal Swedish Academy of Sciences (1832, Mar. 14; 1832, May 9; 1832, Dec. 12), Archives of the RSAS

<sup>37</sup>On translations of the *Transactions* and other RSAS publications, see Beckman (2019). On the status of the RSAS in the 19th century, as reflected in its scientific prizes, see Widmalm (2019).

<sup>38</sup>The contracts for the printing of almanacs and other RSAS publications for the period are located in *Almanacksarrendet, Kontrakt med AB P. A. Norstedt & Söner*, Archives of the RSAS.

<sup>39</sup>Minutes of the Royal Swedish Academy of Sciences (1822, Apr. 3), Archives of the RSAS.



institutions, rather than as a practice of reciprocal gifts. During this period, academies and scientific societies were established across the world, most of them launching their own journals, annuals, or proceedings. The *Comptes rendus* of the Paris Académie des sciences was an early example, launched in 1835 and containing accounts of meetings, presentations, conferences, and other activities, as well as scientific papers.<sup>40</sup> But the range of publications also included almanacs, atlases, statistics, catalogues, and extravagantly illustrated volumes and textbooks. These publications served as entrance tickets to the network of established scientific societies, demonstrating the ambitions of their publishers, and providing the means of acquiring more venerable publications via exchange. Berzelius's *Annual Survey* added to the resources with which the Swedish Academy of Sciences could acquire other desirable publications that were coveted for their content, price, or rarity (such as atlases and richly illustrated works), or for the status of the institution. Although the *Annual Survey* was more influential in translation than in the original, the Swedish version was a valuable exchange asset, pointing to the importance of the exchange itself rather than the practical value of the publication. The fact that all RSAS periodicals were published in Swedish did not discourage exchange, and papers in German, French, and English did not appear in the *Transactions* until 1868, when they were allowed with reference to the very small number of potential Swedish readers of "purely scientific" papers.<sup>41</sup>

An even more useful asset in publication exchange was the *Synopsis of the Proceedings of the Royal Swedish Academy of Sciences* (*Öfversigt öfver Kungl. Vetenskapsakademiens Förhandlingar*), launched by Berzelius in 1844, and directly modelled on the *Bericht der Königlich Preussische Akademie der Wissenschaften* in Berlin—and by extension, the proceedings published in increasing numbers by learned societies across the world. Like its counterparts, it appeared after every general meeting of the Academy, listing meeting activities such as grants, donations, and government commissions, as well as brief versions of papers presented.<sup>42</sup> Conforming to the genre of scientific proceedings, the *Synopsis* served as a more recognisable currency in publication exchange networks than the *Annual Survey*. Similarity facilitated reciprocity and exchange, and the promoters of the *Synopsis* characterised the circulation of such bulletins as a kind of "public correspondence" between learned societies.<sup>43</sup>

The organisation of the RSAS was changed in the first half of the 19th century to accommodate its expanding involvement in publication and exchange. As we have seen, Berzelius appointed an editorial board to supervise publications soon after his election as Permanent Secretary. Since the foundation of the *Transactions*, each paper presented to the Academy had to be evaluated by two fellows before publication, and the establishment of the editorial board did not significantly change reviewing practices; but it formalised and made visible the editorial work involved in publishing the *Transactions* and subsequent periodicals.<sup>44</sup>

The changes in the organisation of the library were more far-reaching. In the early years, the RSAS collections—books as well as specimens—were the shared responsibility of the Secretary and the curator of zoology. By 1831, the management of the library was deemed demanding enough that a new position was created, the collections of instruments and specimens becoming the charge of the respective curators, whereas the newly appointed librarian could devote himself exclusively to the library. The library was not merely the repository of books and periodicals acquired by the RSAS; it also served as the distribution centre for its own publications. As the instructions for the new position were laid out, Berzelius made sure that the task of distributing the *Transactions* and the *Annual Survey* to Academy members, authors, and exchange institutions was added to the duties of cataloguing, organising, and lending books and journals. The prestige and the monetary value of the exchange relationships were demonstrated each year, as the librarian accounted for his activities to the Academy and was granted formal discharge.<sup>45</sup>

<sup>40</sup>Csiszar (2018, Ch. 2). The *Comptes rendus*, in turn, combined features of the commercial scientific press in Britain and the political press in France.

<sup>41</sup>Although the *Transactions* were also translated into German (and occasionally other languages) during the 18th century, these translations were independent enterprises and not part of the RSAS's exchange networks. On language reforms and the importance of translation for RSAS publications, see Beckman (2019).

<sup>42</sup>Minutes of the Royal Swedish Academy of Sciences [Berzelius's proposal] (1843, Nov. 8); [Approval of the proposal] (1843, Dec. 13), Archives of the RSAS. On models for the *Comptes rendus* and the wave of proceedings, see Csiszar (2018, Ch. 2).

<sup>43</sup>Ekströmer, C. J., P. Wahlberg, P., & S. Lovén, S. (1843), [Proposal for a synopsis of the proceedings of the RSAS], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1843, Archives of the RSAS.

<sup>44</sup>Beckman (2016). The relation between historical evaluation practices and modern peer review is discussed in Moxham & Fyfe (2018); Csiszar (2016).

<sup>45</sup>See e.g., Minutes of the Royal Swedish Academy of Sciences (1839, Feb. 13), Archives of the RSAS



The minutiae of publication exchange and its growing importance can be traced through RSAS minutes, library inspectors' reports, and eventually annual reports published in the *Synopsis* itself. From intermittent records of notable acquisitions and new exchange partners, the reports developed into detailed lists of the number of volumes distributed and received, whether through gifts, exchange, or purchases. Early accounts reflect the elastic character of publication exchange, as volumes received from exchange partners could be listed as individual donations elsewhere; but even as both accounts and partnerships were formalised, exchange rarely entailed strictly symmetrical relations, and as a rule acquisition exceeded distribution. The number of exchange partners increased steadily, rising from 106 in 1856 to 960 in 1903.<sup>46</sup>

Determining the value of books and specimens acquired by the RSAS—from gifts, purchases, or exchange—was an intricate task, involving several layers of Academy administration. In 1819, Berzelius, as the new Secretary, proposed that books and specimens donated to the RSAS were to be referred to two fellows for evaluation, similarly to the review of publications.<sup>47</sup> Although these evaluations have left few traces in RSAS documentation, an elaborate routine was soon established. The curators and the librarian made the initial judgement, which was then reviewed by the inspectors, appointed among the fellows of the Academy to supervise the running of the library, the collections, and the other Academy institutions. Their recommendation was, in turn, referred to the *Inspectura Aerarii*, the committee in charge of Academy finances (known from 1850 as the managing committee, or simply the Academy board). The final evaluation was made by the Academy *in pleno*.<sup>48</sup>

These discussions might concern the purchase value of particular publications in relation to the needs of the library, as in the case, cited above, of the desirable atlas offered in exchange by the Geographical Institute in Brussels. This particular decision was considered weighty enough to be referred to the *Inspectura Aerarii* before its final approval.<sup>49</sup> More often, the status of the aspiring exchange partner and its publication were the subject of debate. The *Société de philosophie expérimentale* in Rotterdam approached the RSAS with a request for publication exchange in 1836, and despite its respectable age of 65 years, the society was unknown to the Academy fellows, who expressed doubts about the value of its publications. Exchange relations were eventually established, but the RSAS offered only publications from after 1820.<sup>50</sup> Early editions of the *Transactions* were especially valuable, not least for reasons of practicality. The number of available copies was limited, and the RSAS wanted the offer of a full run to be limited to the most desirable exchange partners. Requests for specific volumes to complete incomplete series were as carefully and parsimoniously considered as new exchange invitations—but if the exchange relation was important enough, the RSAS could go to considerable lengths to provide the publications requested. In a typical, if unusually extensive, exchange matter in 1866, the *Inspectura Aerarii* recommended that the Boston Society of Natural History should receive the *Transactions* from 1739 onwards in exchange for its publications, despite the fact that the RSAS had no copies available at the time, and would have to buy the volumes on the open market. In contrast, the Academy of Sciences in Madrid was only granted recent volumes of the *Synopsis* on the same occasion, as was the Bergen Observatory.<sup>51</sup> The distribution of publications to exchange partners could be withheld if they had proven unreliable in keeping their end of the bargain, as in the case of the Moscow Public Museum in 1863. However, a request for exchange from the renowned

<sup>46</sup>Sundevall, C. & Rydquist, J. E. (1857), *Berättelse om Kungl. Vetenskapsakademiens Bibliothek för år 1856*; Théel, H. & Hasselberg, B. (1904), [Annual report on the RSAS Library, 1903]; both in *Inspektionsberättelser, Biblioteket, Sekreterarens arkiv 57:1b*, Archives of the RSAS. The accounts of the RSAS publication exchange are distributed across several archives and publications. Individual donations and requests for publication exchange are often, but not invariably, listed in the RSAS Minutes. From 1821, reports from the library inspectors contained general accounts of acquisitions and distribution, but the number of volumes was not regularly reported until 1856. From 1865, the number of acquisitions was included in the annual report on RSAS activities printed in the *Synopsis*; and from 1867, the number of exchange partners was added to this report. Incomplete lists of institutions receiving copies of RSAS publications are kept in the archives of Stockholm University Library: *Utdelning av akademiens egna oöch vissa andra skrifter*, Ms. Acta Sv. KVA Bibl., Stockholm University Library, Stockholm, Sweden.

<sup>47</sup>Minutes of the Royal Swedish Academy of Sciences (1819, Oct. 27), Archives of the RSAS. However, these reports were not discussed at Academy meetings, nor were they included in Academy accounts.

<sup>48</sup>For consistency I will refer to it as the "*Inspectura Aerarii*" in this paper. An overview of the organisation of the RSAS, with its various collections, inspectorates, and committees, is available in Dahlgren (1915).

<sup>49</sup>Minutes of the Royal Swedish Academy of Sciences (1837, Oct. 11), Archives of the RSAS.

<sup>50</sup>Minutes of the Royal Swedish Academy of Sciences (1836, Sep. 14), Archives of the RSAS.

<sup>51</sup>Minutes of the *Inspectura aerarii* (1866, Feb. 14), Archives of the RSAS. The contentious issue of rights to back issues was not included in the contract, but was eventually settled in a separate agreement in which Norstedt & Söner agreed to turn over half of their stock of older Academy publications to the RSAS: Minutes of the *Inspectura aerarii* (1867, Jan. 4), Archives of the RSAS.

Anthropological Society of London in the same year was approved, but with the proviso that only relevant excerpts of the RSAS publications would be exchanged, given the specialised interests of the institution.<sup>52</sup>

## 5 | EXCHANGE AS AN INSTRUMENT OF PUBLICATION REFORM

In exchange relations and calculations, the role of the Academy as publisher was formally and visibly linked to its role as a repository and receiver of scientific findings. Decisions about the design, content, and number of publications were made by a wider group of Academy officials. In these decisions, exchange value was frequently cited as a crucial consideration, and the tasks of the editor and Secretary gradually spilled onto the librarian. All of the major publication reforms undertaken at the RSAS during the second half of the 19th century were motivated, at least in part, by library concerns. These include the decision to abolish the *Annual Survey* in 1858, the establishment of the *Appendix to the Proceedings of the Royal Swedish Academy of Sciences* as a new periodical for shorter papers in 1872, the division of the *Appendix* into four specialised publications in 1884, and finally, the demise of the *Proceedings* and the transformation of the four *Appendices* into nominally independent journals.

Although the *Annual Survey* was an important asset in the RSAS exchange networks in the first half of the 19th century, it was heavily dependent on the editorial energy and scientific reputation of its creator. Ten years after Berzelius's death in 1848, focus had shifted to other Academy publications, and the once invaluable *Survey* was discontinued.<sup>53</sup> The proposal was made by the physician Anders Retzius, who was not directly involved either in the library or the editorial board; however, he was a member of the powerful *Inspectura Aerarii*. In addition, he had served for almost two decades as one of the inspectors of the zoological collections and, in this capacity, was well aware of the time spent by the curators in producing their parts of the *Survey*. His main argument against the publication was professional: the expanding duties of the curators made the *Survey* work unmanageable, as did the escalating number of scientific publications. In 1858, the task was deemed impossible for any single scholar.

After some deliberation, the issue was referred back to Retzius and the physicist Fabian Wrede, whose experience as inspector of the RSAS institutions of physics and astronomy was similar to that of Retzius. Since Berzelius had made the publication of the *Annual Survey* a stipulation in the Statutes of the RSAS in 1821, getting it abolished was a lengthy process involving royal approval of the amended statutes. In their detailed proposal, Retzius and Wrede cited not only the increasing workload of RSAS officials, but the diminishing value and prestige of the *Survey*. Always more successful abroad than at home, the Swedish copies languished unsold at the printers, while the translated versions had become overshadowed by foreign competitors.<sup>54</sup>

By 1858, the *Survey* had ceased to be the most coveted of the RSAS publications. The reputation and capacity of a single editor such as Berzelius was no longer sufficient for the success of the publication, and the demise of the *Survey* marks a transition to large-scale management of scientific publication, where exchange values were negotiated on institutional, rather than individual, levels. Despite the demise of the *Annual Survey*, the exchange activities of the RSAS expanded steadily. The number of copies printed of the *Transactions*, the *Synopsis*, and the new *Meteorological Observations* (launched in 1860) was increased several times in the course of the 1860s, and the number of institutions included in the exchange system doubled.<sup>55</sup> In 1867, a further increase of 50 copies of the *Transactions* and the *Synopsis* was approved specifically in order to be cut up, providing the librarian (and to some extent, authors) with off-prints of individual papers for distribution to specialised exchange partners, who were not considered interested in—or deserving of—complete volumes.<sup>56</sup>

<sup>52</sup>Minutes of the Royal Swedish Academy of Sciences (1863, Nov. 11), Archives of the RSAS.

<sup>53</sup>Minutes of the Royal Swedish Academy of Sciences (1858, May 12), Archives of the RSAS.

<sup>54</sup>Wrede, F. & Retzius, A. (1858, Jun. 4), [Proposal], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1858, Archives of the RSAS.

<sup>55</sup>Minutes of the *Inspectura Aerarii* (1866, Dec. 7), Archives of the RSAS.

<sup>56</sup>Minutes of the *Inspectura Aerarii* (1867, Jan. 4), Archives of the RSAS.

Over the same period, the *Synopsis* increased in girth as well as in circulation. So did the *Transactions*, again resulting in delays and dissatisfaction among authors. In theory, shorter papers should be published in the *Synopsis* and more ambitious ones in the *Transactions*, but it was increasingly difficult to determine which papers should go into which publication. In 1872, Fabian Wrede (again) proposed that papers too long for the *Synopsis*, yet unsuitable for the *Transactions*, should be published separately in an *Appendix to the Proceedings of the Royal Swedish Academy of Sciences* (*Bihang till Kungl. Vetenskapsakademiens förhandlingar*). The *Appendix* could also accommodate late papers, thus removing one of the obstacles to the regular appearance of the *Transactions*. Moreover, each paper should be paged separately—facilitating the quick and inexpensive exchange of publications between individual authors—and only later bound into yearly volumes. The proposal was approved and the Academy found itself with three different periodicals (in addition to the *Meteorological Observations* and a somewhat sporadic series of biographical notes on deceased fellows), all of which published scientific papers, but of different lengths and prestige: the *Transactions*, the *Synopsis*, and the *Appendix*.<sup>57</sup>

However, the increase in publication continued, now primarily in the *Appendix*, which soon also grew unwieldy. Its size and confusing organisation made it difficult for readers to find relevant papers. More importantly, it made it unsuitable for exchange. In 1884, the inspectors of the RSAS library proposed yet another publication reform:

The irregularity [i.e., the mixed topics] causes no small difficulty in the exchange of Academy publications, which has long been substantial and each year increases in volume and labour. The Academy distributes its publications, both in complete volumes, and (to such small societies which are devoted to specific branches of science) as off-prints, that is pieces that are extracted from the volumes and bound separately—so that some societies receive the chemical papers from the *Transactions*, the *Synopsis*, and the *Appendix*, others the botanical papers, and yet others the zoological papers or even only those concerned with certain classes of animals, etc.<sup>58</sup>

This procedure, “time-consuming, costly, and prone to mistakes and irregularities,” would be greatly facilitated through the division of the *Appendix* into four specialised journals: Mathematics and Physics, Chemistry and Mineralogy, Zoology, and Botany.

The distribution of the Academy publications would thus be facilitated, so that a great number of specialised institutions, who do not receive the full range of Academy publications, could receive undivided volumes containing [only] those subjects of immediate concern to them.<sup>59</sup>

Other societies were cited as precedent: the journals of the Royal Societies of London and Dublin, and the Academies of Vienna, St. Petersburg, Copenhagen, and Haarlem had all gone through similar reforms. Several fellows lamented the loss of scientific unity and overview provided by the sprawling *Appendix*, and the Permanent Secretary—still nominally the editor—was upset and voted against the proposal. One fellow raised the issue of the increased editorial work and expenses that four different journals would entail, but the library inspectors were confident that the extra work could be easily managed by fellows and curators, and the *Inspectura Aerarii* had no fiscal concerns.<sup>60</sup> After a close vote, the library inspectors carried the day.<sup>61</sup>

The next substantial reform, in 1903, was wholly directed by the librarian. This time, the *Synopsis* and the four *Appendices* were all discontinued, and replaced by a *Yearbook* and four specialised journals, each with the title

<sup>57</sup>Minutes of the Royal Swedish Academy of Sciences (1871, Dec. 13; 1872, Jan. 10), Archives of the RSAS.

<sup>58</sup>Lovén, S. & Key, A. (1884, Dec. 16), [Proposal for a change in the organisation of Academy publications], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1885, Archives of the RSAS.

<sup>59</sup>Lovén, S. & Key, A. (1884, Dec. 16), [Proposal for a change in the organisation of Academy publications], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1885, Archives of the RSAS.

<sup>60</sup>Nordenskiöld, A. E. (1885, Oct. 14), [Address to the minutes of the Royal Swedish Academy of Sciences regarding a change in the organisation of academy publications], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1885, Archives of the RSAS.

<sup>61</sup>Minutes of the Royal Swedish Academy of Sciences (1885, Nov. 11; 1886, Jan. 13), Archives of the RSAS

Archives—although the *Transactions* remained the flagship periodical, carrying the name and history of the RSAS.<sup>62</sup>

## 6 | CONCLUSION

The journal reforms of the RSAS during the 19th century demonstrate that publication exchange was crucially important for the design and development of scientific periodicals. During this period, the continuing discussion in RSAS meetings and committees of the content, management, cost, and design of publications was increasingly conducted in the context of exchange, with the library assuming a crucial role. Viewed in this light, the convergence of publications in different countries and disciplines to similar genres and formats was not only a general question of genre and status, where prestigious institutions set the standard for less prominent colleagues. It also reflected the rules and norms—tacit and explicit—of a system of exchange, where one of the tasks of individual editors was to increase the value of their particular currency without making it too dissimilar to other currencies and thus difficult to exchange, pointing to exchange as an important factor in the convergence of scientific publications. Although subject to many of the same deliberations of commercial value and institutional prestige as the book trade, publication exchange operated across different commercial contexts and articulated a wider range of values of scientific publications. It highlights the importance of publication, not only for the distribution of scientific knowledge, but for its acquisition.

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<sup>62</sup>Dahlgren, E. (1902), [Proposal for a change in the organisation of Academy publications], Appendix to the Minutes of the Royal Swedish Academy of Sciences 1902, Archives of the RSAS; Minutes of the Royal Swedish Academy of Sciences (1902, Nov. 12), Archives of the RSAS. The episode is also described by the librarian Erik Dahlgren in his autobiographical sketch, Dahlgren (1995, pp. 140–142).

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**How to cite this article:** Beckman J. Editors, librarians, and publication exchange: The Royal Swedish Academy of Sciences in the long 19th century. *Centaurus*. 2020;62:98–110. <https://doi.org/10.1111/1600-0498.12267>