INTRODUCTION

This volume grew out of the common initiative of Jeanne Peiffer and Jean-Pierre Vittu, who aimed to explore the interactions between ‘scientific periodicals’ and the making of ‘science’ in early modern Europe, during the period that spans more than a century, from 1665 to the beginning of the 19th century. Our program, from its start, in 2005, aimed at exploring the periodical form and its effects on the making and circulation of science in a broad European perspective.

The network of collaborators of this volume has been patiently built up since a first meeting of the core group in 2005 in Wolfenbüttel, Germany. The inputs, questions and suggestions we received during this first meeting have guided our research over the years. Several workshops – in Oxford 2006, Orléans 2007, Vienna 2008 – of the network have enabled us to develop a common research agenda, starting from different case studies, and to use methods rooted in various research traditions and disciplines, such as the history of the periodical press, early modern history, history of science, and so forth. A regular seminar in Paris was devoted to the presentation and discussion of the work while it was in progress.

A decisive step in the writing of this volume was achieved during the three months of residence in Paris (from January to March 2008) of a small group of scholars. Most of the material published in this volume has been critically discussed by the group; the single studies have been incorporated in a general narrative, and the basic concepts assessed.

Defining Learned Journals

Our approach to the object of our common research, 17th to early 19th century learned journals – *gelehrte Zeitungen*, *giornali de’ letterati*, *journaux savants*, … – relies on our familiarity with the actors’ own words in the prefaces of European journals, as well as on the definitions of journals found in contemporary dictionaries and encyclopaedias. The journals have been characterized by the publication, at regular intervals and under the same title, of short pieces, each issue including different themes and authorial voices. Whatever the regularity, – weekly, monthly or quarterly – each issue is part of an ongoing series and will often end up as part of a book. Instruments of classification, and sometimes of bibliography and indexation, give access to the information published in the journal. This information takes different textual forms, such as ‘excerpts’ – or more or less critical reviews – of books, memoirs, and news from the learned world. As stated in the 1791 *Préface* to the *Journal des savants*, “tous les grands ouvrages

1. This group included Iordan Avramov, Maria Conforti, Patrizia Delpiano, Jens Haeseler, Ingemar Oscarsson, Jeanne Peiffer, Fernando Reis, and Jean-Pierre Vittu.
dans toutes les langues, toutes les connaissances de tous les pays, voilà ce qu’ils se chargent d’annoncer, d’extraire et de discuter”.

The journalists, especially in the first journals, understood by ‘excerpts’ of books more or less long abstracts describing their exact contents. Johann Heinrich Zedler’s *Universal-Lexicon* (1731-1754) gives the following definition: “Bey den Gelehrten ist ein Journal so viel, als eine Schrift von etlichen wenigen Bogen, deren darin enthaltene Materien und Abhandlungen, aus einer andern weitläuffigeren Schrift kurz zusammen gezogen sind, und dem Leser dasjenige in beliebter Kürze auf einmal vor Augen stellen, was er hier nicht ohne viele Weitläufigkeit, Mühe und Zeit durchlesen kan” (entry Tage-Buch). Due to the abbreviation of extensive texts, the reader is able to absorb at a single glance and without effort all of the existing knowledge. Some sheets of paper delivered regularly gave access to a library whose virtual extension may be considered infinite.

This idea was explicit in titles such as *Bibliothèque universelle, Bibliothèque ancienne et moderne* or *Universal Magazine of Knowledge and Pleasure*. The topos of the library, often present in titles or prefaces, refers either to the total production of the learned world, or to all the knowledge produced in a specific area (linguistic, geographical, etc.), or in a specialised field of knowledge. *Bibliothèque germanique, Warschauer Bibliothek, Biblioteca italiana, Bibliothek von Anzeigen und Auszügen kleiner meist Akademischer Schriften, Bibliothek ausländischer Chemisten, Biblioteca fisica d’Europa and Bibliothek fuer Physik* are among the examples. The épître in the first issue of the *Mémoires de Trévoux* compares the journal to a kind of library, which is not to be contained by such narrow walls. In any case, the idea of a library suggests a demarcation between the scholarly world and the trivial, as suggested by the following quotation: “To give as Opportunity offers, the Abstracts or Accounts of such Books, relating to the Ends of the Royal Society’s Institution, as the Authors shall please to communicate themselves; which shall be distinguished from others: or of such as are with difficulty to be procured in England, or extraordinary in their kind; upon which there shall sometimes be added some Remarks”.

Along with the excerpts, the learned journals may publish what we consider original memoirs. The first issue of the *Journal des savants* introduces these memoirs as follows: “on fera savoir les expériences de Physique et de Chimie, qui peuvent servir à expliquer les effets de la Nature: les nouvelles découvertes qui se font dans les Arts et dans les Sciences, comme les machines et les inventions utiles que peuvent fournir les Mathématiques; les observations du Ciel, celles des Météores, et ce que l’Anatomie pourra trouver de nouveau dans les

Introduction

Memoirs, as the entry ‘Journal’ of Chamber’s Cyclopaedia (1728) puts it, concern “new Improvements daily made in Arts and Sciences”. These may be given as extracts of letters, accounts of experiments and observations or ‘short tracts’. While the Prefaces mention broad scientific fields, like Physics, Chemistry, Medicine, Mathematics or Astronomy, the articles in fact contribute to a wider range of topics, including machines, natural history, law, numismatics, inscriptions, travels, etc.

Some journals offer more space to original memoirs than others. While Friedrich Nicolai, for instance, did not publish any of them, devoting instead his Allgemeine deutsche Bibliothek (1765-1794) to accounts of books in German, François Rozier included only memoirs, short or longer, in his Observations et Mémoires sur la physique, sur l’histoire naturelle et sur les arts et métiers (1773-1793). Explaining his reasons for creating the periodical, he stated: “Ces motifs ont fait désirer qu’un Ouvrage périodique, d’un débit sûr & animé, annonçât les découvertes qui se font chaque jour dans les différentes parties des Sciences, soit par des Notices abrégées, soit par des Mémoires très-étendus, qui contiennent le développement et toutes les preuves de ces découvertes, en traçant même la marche de l’esprit inventeur. On a pensé que ce moyen, le plus prompt pour la publication des découvertes nouvelles, accélérerait également le progrès des Sciences, qui ne sont autre chose que la somme de ces découvertes.”

In addition to memoirs and excerpts, many learned journals offer news from the learned world, including information on recent or forthcoming publications, subscriptions, ongoing research activities, university life, prize questions of the European academies; less frequently, advertisements for private courses, scientific instruments, calls for intellectual collaboration. As happens in the gazettes, these short news articles are listed in a geographical order, under the headings of the towns where the event was taking place. The order in which the various towns are listed seems particular to the different journals and suggests the order in which the news might have been received by the journalists. Also, in some cases they have been published as excerpts of letters addressed to the author/editor, and mentioning the city from where they were sent. These pieces of news are sometimes assembled in a specific section located towards the end of each issue. Moreover, some periodicals are exclusively devoted to such news; this is the case, for instance, of the Nouvelles littéraires (cf. the paper by Edwin van Meerkerk in this volume), the Novelle letterarie published in Florence by Giovanni Lami and the Jenaische gelehrte Zeitungen, to mention just one amongst the many German periodicals.

Rezensionszeitschriften, i.e. journals containing only excerpts excluding memoirs and news, which constitute a specific genre among the periodicals.

The aim, stated in the programs of the latter, is mainly to circulate the learned information without weighing or criticising the actual content they convey. Both aspects – to make known or circulate knowledge, on the one hand, and to critically assess the knowledge circulated, on the other – constitute a common background to the entire production of learned periodicals. The second aspect appears mainly in academic collections, which publish only validated knowledge, i.e. knowledge accepted by a small elite group of selected academicians. That’s why the entry “Journal” of Diderot and d’Alembert’s Encyclopédie excludes academic series: “Les memoires & l’histoire de l’académie des Sciences, […] les essais de la société de Dublin, & autres ouvages semblables, ne sont point des journaux, dans lesquels on rende compte des ouvrages nouveaux ; mais ce sont des collections de memoires faits par les savans qui composent ces différentes sociétés savantes”\textsuperscript{10}. In addition, academic memoirs, when compared to learned journals, are often published with some delay and with a rather long – mostly annual – periodicity. However, some case studies published in this volume show a greater complexity. Certain academies, like the Swedish one (cf. Ingemar Oscarsson), publish quarterlies in Swedish, which may thus be subsumed under the category of learned journals.

State of the Art

How and when did learned periodicals have become an object of interest and study? In order to answer the question, we may identify some approaches – and methodologies – in historiography, not to be seen in strict chronological order, but as broad categories, still considered useful and still used today.

The first is a bibliographic and cataloguing approach, beginning in the 19th century. In many of these catalogues, compiled through a classical bibliographic method, ‘technical-scientific’ periodicals were singled out according to a notion of ‘science’ now largely anachronistic.

The second approach is more closely related to a traditional, ‘internalist’ view of the history of science itself; it has given rise to studies on the developments in periodical literature related to single scientific disciplines or fields of research. For example Gino Loria’s 1899 and 1941 papers where he studied the Acta eruditorum and the Giornale de’ letterati d’Italia as sources for the history of mathematics.

A more general questioning of the role and specificity of scientific periodicals has come to the fore with David A. Kronick’s A History of Scientific and Technical Periodicals (1962)\textsuperscript{11}. Still written from a bibliographical perspective, this work, nevertheless, deals more than ever with the specific question of the intel-

\textsuperscript{10}. Encyclopédie, art. Journal, vol. 8, 1765, p. 896.

lectual origins of scientific periodicals, as well as that of their readership. Further work in this direction has come to light with the publication of inventories of learned journals and prosopographies of their editors (Gascoigne 1995); (Kronick 1991); (Kuhles 1994); (Sgard 1991, 1999); (Taszus 1998).

A number of studies have been devoted to single periodicals, such as Hubert Laeven’s monograph on the Leipzig Acta eruditorum under the editorship of Otto Mencke, Jean Ehrard’s and Jacques Roger’s comparative study of the French Journal des savants, and the Mémoires pour l’histoire des sciences et des beaux-arts (Trévoux). A seminal work, in this perspective, is James McClellan’s The Scientific Press in Transition (1979). By analysing Rozier’s case, the author traces a distinction between different typologies, and thus readings, of scientific journals. In the process, McClellan also develops innovative lines of research on journalists’ working methods and sources and on their relationship with scientific academies.

To find a path in the jungle of the almost innumerable specific contributions published in the past decades, a useful approach could be to follow the development of ‘national’ historiographical perspectives – until now largely prevailing, as demonstrated by studies on local contexts and audiences (Fiering 1976); (Gardair 1984); (Broman 2000); (Simone De Angelis 2003); (Nicoli 2005). In fact, a number of studies were developed inside national frameworks, or at least inside homogeneous linguistic areas (Albertan 1999); (Bots 1972, 1976-1984); (Laeven 1986, 1990). To put it in very broad terms, while Italian historiography has privileged the analysis of contents and meanings of the journals (Berengo 1962); (Venturi 1969-1990); (Ricuperati 1976, 1982, 1986), the French perspective has focused mainly on the direction of the history of the book (Ehrard & Roger 1965), while the Anglo-Saxon approach has underlined the role of academies (especially the Royal Society) and that of the book trade (Johns 1998, 2000).

Moving to broader questions and problems, some focuses of debate can be singled out. The first was triggered by Jürgen Habermas’ 1962 Strukturwandel der Öffentlichkeit, and by subsequent discussions; the development of the periodical press has thus been read as one of the means of expression of the public opinion (Broman 2000); (Lynn 2006), for instance. A second point is the discussion over forms of communication within the scientific world, or in the so-called République des Lettres (Bots & Waquet 1997). A further development is the question of the circulation, or popularization of scientific information. This may well be deemed an element emerging only in the later period, that is, with the emergence of specialised and scientific vs. popular press in the 19th century (Cantor et al. 2004). On the contrary, the interactivity of journals with diverse publics and the development of means of communication means to facilitate the dissemination of knowledge is already a crucial question in the Old Regime (Wigelsworth 2010). Problems of truth and trust, a central concern to the history of the sciences after the influential book by Shapin & Schaffer, Leviathan and the Air Pump (1985), have given rise to a number of studies, also contributing to the nuancing and definition of notions

12. The bibliographical references of the volumes and papers quoted in this section by (name, date) are to be found in the Bibliography at the end of the volume.
such as scientific credibility and scientific authorship (Kronick 1978); (Iliffe 1997); (Galison & Biagioli 2003). As a conclusion, it is to be underlined that the relation between periodicals and the history of book circulation on the one hand, and the history of reading on the other hand represents a continuing focus of debate. The history of science still has much to accomplish in terms of profiting from the information and discussions in this field (Johns 1998); (Secord 2004).

Aims of the Research

This volume aims at a broader perspective in the study of learned journals as well as at a significant shift of focus. We consider learned journals primarily as tools for scientific practice and enquiry, that is, tools for collecting, selecting, preserving, classifying, transmitting and using knowledge.

With the creation of journals, a new kind of actor appears on the scene, the ‘author’ of the journal. By collecting and selecting books, memoirs, and news intended for an imagined audience, s/he plays the role of an intermediary between the author and the publisher. In so doing, the ‘author’ of the journal strongly depends on his network of collaborators and correspondents, who provide him with facts, news, reviews of recently published books, and all kinds of scholarly information, which is thought to suit the intended audience.

By means of the periodical reiteration and accumulation of news, information, and memoirs, the journals become a tool for preserving knowledge, as the use of the new medium by savants clearly shows. In order to allow access to these repositories of knowledge, the journalists develop topical instruments in the form of systematic tables and indexes drawn up over long periods. The practices linked to the procedures of collecting and selecting, preserving and indexing differ in different cultural settings and their comparison is one aspect of our overall study.

One underlying assumption of many contributions to this volume is that the genre of scientific communication by means of periodicals develops throughout the 18th century, experimenting with different versions and forms. At the end of the century, scientific communication reaches autonomy and stability by developing its own rules, thus achieving a degree of formalisation and becoming an institution in its own right. In this more mature form, it is appropriated by specific disciplines, like chemistry, mathematics, engineering techniques, medicine, agronomy, et al. These different appropriations give rise to a new type of journal, the specialised journal that shaped the making of knowledge over the course of two centuries. One of our aims is to assess this assumption and to test the hypothesis of the origins of the specialised scientific journal from the general journal.

Geographical and Chronological Extension

Most case studies in this volume are focused on general learned journals which were created first in France with the *Journal des savants* (January 1665)
founded by Denis de Sallo, then in England with the *Philosophical Transactions* (March 1665) founded by Henry Oldenburg. This model was reproduced with slight variations by a substantial number of journals created before the 1720s. While the *Nouvelles de la République des lettres*, created by Pierre Bayle in Amsterdam in 1684, followed the model of the *Journal des savants*, the monthly *Acta eruditorum*, created in Leipzig in 1682 by Otto Mencke, was not the work of a single journalist but that of an editorial board, the ‘collectors’ who were responsible for collecting the material to be published. Throughout the 18th century, the number of titles was quickly increasing all over Europe, the initial model underwent local changes and the first specialised journals appeared in the second half of the century. Some limited their contents to specific geographical areas, for instance *Bibliothèque britannique* or *Warschauer Bibliothek*, while others were dedicated to specific scientific domains such as *Chemische Annalen für die Freunde der Naturlehre, Arzneigärtnerey, Haushaltungskunst und Manufakturen, Neues botanisches Gartenjournal*, *Annali di chimica* or *The London Medical Journal*. In general, however, the evolution over time of learned journals varied much from one geographical area to the other. In Southern Europe, in the Kingdom of Naples or Portugal for example, the creation of encyclopaedic learned journals started only towards the end of the century and went on until the middle of the 19th century, while, during the same period in Northern Europe the learned journals changed and specialised, as mentioned above. For this reason, we have fixed the upper time limit of our study to 1820.

Most studies in this volume are devoted to Europe, from France to Russia, and from Portugal to Sweden. Our aim was to extend our investigation to the entire continent, however some countries where learned journals already existed in our defined time period, like Spain or Poland, could not be included.

In general, the volume shows that the development of learned journals in Europe, from 1665 to broadly 1820, cannot be subsumed under a single line. A highly diversified situation with significant national differences makes it virtually impossible to identify a common periodisation for the whole of the European space.

Structure of the Volume

We have chosen to organize the studies collected in this volume in four sections: Publication, circulation, public, appropriation by the savants. These sections correspond to the stages through which the learned journals are handled, from their initial planning to their use by the savants.

In the first section, ‘Publication’, we include studies concerning the making of the journals, starting with editorial strategies, their formulations in the paratexts and their effects on the contents and the material form, i.e. the different ways in which the selected information is ordered, arranged in rubrics, set up, laid out, and eventually printed. The second section is more specifically devoted to the study of the networks built or used by the ‘authors’ of the journals in order to col-
Jeanne Peiffer, Maria Conforti, Patrizia Delpiano

lect their information. Once the journals are launched, they circulate along commercial and intellectual networks and are received by various audiences, which are studied in our third part. We have collected information on the reading audiences of learned journals primarily via the journals themselves. The prefaces or other paratexts address intended readers, who in the period studied are typically the curious and the learned. The publication of readers’ letters in the journals conveys information on at least some real readers. The fact that some titles are partially or completely reissued, bears witness to the success of these titles with new audiences. Finally, in the fourth and last part, we investigate the uses of the new medium by savants. Indeed, periodicals were appropriated quickly in different ways, for both personal and professional uses, especially in teaching environments, as well as for strategic purposes in debates and controversies. Learned journals were also used by groups of savants in order to project an appealing image of their theories or activities.

The contributions prepared for this volume are case studies chosen by the authors according to their competence, linguistic skills, and access to sources. They bear witness to the different areas of interest of their authors, answer specific questions anchored in different disciplinary fields, and use different methodological approaches. Nevertheless, they are structured around a series of common questions: explicit programmatic statements of the editors; materiality of the journal (typography, structure, format, periodicity); the question of the commercial importance, links and networks of the journals editors; the emergence and evolution of specific research themes in a journal; the role of single disciplines in a journal, their relative importance, and the changes they undergo; the possible publication strategies of single authors; examples of the interactions between periodicity and knowledge production; the tools of topicality (bibliographies, indexes, tables), their nature, their periodicity (annual or recapitulatory), their structure by title, keyword, matter, etc.; the dynamics of disciplinary changes as embodied in the classification structure and headings; translations or summaries of the contents of a journal; migration of themes across Europe, discussions and controversies including several journals.

Among the sources used by the contributors to this volume, the periodicals themselves are certainly the most important, but attention has also been given to archival manuscript sources, correspondences, lists of subscribers (if extant), library catalogues (see in particular Patrick Latour), book auction catalogues, biographies, etc.

Substantive versus Derivative Journals

In his seminal book, *A History of Scientific and Technical Periodicals* (1962)\(^{13}\), David A. Kronick introduces a distinction between substantive journals

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and derivative journals. This distinction seems to be based on the various components of the scientific serial which he defines as the original contribution, the extract or abstract from other published journals or books, the book review, and the news report. While he defined substantive journals, “periodicals which included original contributions”, as “not derivative or dependent”, Kronick never specifies what precisely derivative journals are. Using Kronick’s distinction, McClellan defines substantive journals as “the locus of original publication of science” and “derivative publications” that reprinted or excerpted materials from other “published sources”. McClellan’s definitions do not take into account news reports which may be either original or derivative. Both insist that this taxonomy of the scientific press should not be applied rigidly. In our experience, learned journals are more often mixed or composite than purely substantive or derivative. In this regard, the distinction between substantive and derivative has not been useful for our purpose. Indeed, this distinction does not rely on the textual form, but introduces a teleological judgement on what is considered original. Originality is not necessarily a category in terms of what early modern authors thought of their writings. In our opinion, Kronick’s distinction relies too heavily on the contemporary understanding of authorship and originality. Commenting on books, as well as excerpting them, was considered in the 17th and 18th centuries as a form of original writing. Our definition of learned journals in terms of their periodical form allows us to consider the various components of the serial – three in our pattern, where there is no distinction between book reviews and excerpts – as original results of different writing practices.

Memoirs, excerpts of books, and learned news alike contribute to the making of science. Additional bibliographies, annual tables or indices make the learned journals an efficient tool for scientific enquiry in classifying the stored knowledge, thus giving access to it and also organising the scientific world.

Journals and Scientific Practice

Scientific practitioners are involved at various levels in the joint production of journals and knowledge. As founders or creators of journals, they are defining editorial policies which may have far-reaching consequences on the scientific practice itself. By addressing the potential reader, establishing the rules and codes to be followed by potential authors, mobilising their personal networks, and indexing the topics treated, they fully participate in shaping the scientific publishing policy, the scientific communication, and the building of disciplines.

Before learned journals appeared in the last third of the 17th century, scholarly communication took place either in face-to-face conversations and discussions, in epistolary exchanges or via the costly publication of books. The core question of

The essays in this book show that to some extent the printed form of short pieces—memoirs, observations, book reviews, advertisements, information—published at random but in a sequence has introduced new uses for already existing scientific textual practices (like bibliography, classification, indexes, etc.) and transformed the ways in which scientific information is retrieved, organized, and made accessible to readers.

Journals are more than a collection of short pieces issued periodically: they can also become books, the issues being bound together in mostly annual volumes, which may then be considered as crucial repositories of knowledge. Moreover, the knowledge conveyed by journals is strongly mediated by books, as a large part of the learned information given in their pages concerns book reviews. While 16th century *historia literaria* simply listed books (and put them in a systematic order), journals offer ‘extracts’, i.e. an outline of their contents and at times a broader contextualisation and/or a critical judgment. This practice develops with the growth of the number of printed books. It becomes more and more difficult to read them all, and, as previously mentioned, the idea of journals as virtual libraries for those who do not have time to read is often expressed in the journals studied in this volume. Extracting or reviewing books develops into a scientific practice, which allows savants to be informed, to order the information gathered, and to retrieve it. The example of Albrecht von Haller’s manuscript convolutes composed of slips of paper, each containing a short description of a book and sewed together, today kept in Bern, speaks for itself. Apart from the mediation of learned information, what is at stake in the reviewing process is the birth of bibliography as a scientific tool. Furthermore, the paper by Martin Gierl in this volume shows the importance of the phenomenon of self-reviewing in the *Goettingische gelehrte Anzeigen*. This process is part of a self-presentation of the University of Goettingen and its science in action. As Gierl shows, the focus is on new science, unconventional information and topical issues, with the view in mind to describe Goettingen science as competitive in the eyes of policy-makers. To build reputations through public relations, therefore, becomes a part of scholarly practice.

While the editors of journals strongly insist on the impartiality of the book reviews they publish, readers and especially authors of the excerpted books describe journals as *tribunaux de science*, thus emphasizing their critical function. To escape this tribunal was certainly a reason why Goettingen professors themselves wrote anonymous reviews of their own books. But anonymity was often used in order to downplay, critically debate, or reject new ideas. The idea of journals acting as *tribunaux de science* or as judges legitimating knowledge, often invoked by the actors, is to be better assessed, or squarely rejected, as several recently investigated examples show. Journals refer to scientists or to scientific institutions as the Académie royale des sciences in order to assess the validity of
a phenomenon described in an article, as in the case of the squaring of the circle\(^{15}\). However, journals did have a moderating role in scientific contests. In this volume, Uwe Mayer shows how the efforts by Otto Mencke to prevent a public escalation of the dispute between Huygens and Tschirnhaus question the myth of impartiality of the *Acta eruditorum*.

Returning to the important role of journals as repositories of knowledge, is it possible to accept or reject, or at least to better assess, this notion? In order to give access to the information contained in the journals, the practice of indexing knowledge had to be considerably developed. Indeed, bits of information—observations, experiences, medical cases, calculations, demonstrations of a mathematical propriety, measurements, machines, medals and inscriptions, lectures, etc.—were printed in a random order. What has often been described as a farrago or as mixed (intellectual) fodder for the reader had to be organised and made accessible. The pieces of knowledge were labelled and its labels included under the headings of a table. This classifying practice, which often relied on the existing scientific disciplines, had far-reaching consequences on the structure of knowledge, finally leading towards its ever-growing specialisation. The investigation of the changing labels and headings used to describe topical knowledge, still to be achieved, would teach us a lot about the building of disciplines and their dynamics.

Early signs of specialisation can often be encountered in the material studied here, even if specialised journals as such did not appear before the second half of the 18th century (e.g., Rozier’s *Observations sur la Physique* and *Annales de chimie*, or Hindenburg’s mathematical journals). In this volume, the description by Jens Haeseler of the sharing of information between the *Nouvelle bibliothèque germanique* (1746-1759) and the Academic memoirs points towards a specialisation process in Berlin, as do debates on technological or scientific terminology (Raffaella Seligardi). With the rise of specialised journals, published in vernacular languages—*Chemische Annalen* by Crell, *Annales de chimie*, *Annali di chimica* studied by Patrice Bret—, the need for translations was increasing. The interplay between specialised journals in the same field was strong, the same papers often being translated into the major European languages. The circulation of specialised knowledge via the translation processes opens up a rather new field of investigation which is now steadily growing in the history of science.

With the increase of specialisation, journals show a growing differentiation and play a more significant role in the building of (scientific) communities. In Italy, as of the early 18th century, analysts, as opposed to geometers, gathered around the *Giornale de’ letterati d’Italia* and formed a group of mathematicians defined not only by an approach to mathematics, but also by their specific link to

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the journal. The chemical journals of the second half of the 18th century, studied in this volume by Patrice Bret and Raffaeella Seligardi, illustrate a crucial process of community building. Indeed, Luigi Brugnatelli built his journal, *Annali di chimica*, on a scientific program opposing Lavoisier’s at the origin of *Annales de chimie*. He thus gathered around his *Annali* the chemists who were to varying degrees, friendly to or following his program.

As far as the uses of periodicals by scientific practitioners are concerned, we know from correspondences, reading lists, and academic statements that they were actively seeking the information and news circulated by journals. To quote one example from this volume, the Turin Academy of Sciences, founded in 1783, made reading notes concerning the information found in various foreign journals to which the Academy had subscribed. Academic lecturers like Vallisneri in Padova (but also Varignon at the Collège des Quatre-Nations in Paris) made use of pieces of information excerpted from learned journals (cf. Brendan Dooley in this volume). There is considerable handwritten evidence that journals were excerpted the same way as books were, and that the excerpts were circulated together with epistolary correspondence. Many instances of collections of excerpts from journals in different European libraries involve single disciplines, a savant copying, or having copied, all the pieces of knowledge concerning astronomy, medicine, mathematics, and others. In the early 18th century, Antoine Parent, a physicist and member of the *Académie royale des sciences* in Paris, even had the idea to produce a periodical translating and printing excerpts about mathematics and physics from the most important European scholarly journals of the period. In other words, from the beginning, scientific practitioners were eager to collect the knowledge available in journals in their specific discipline, be it bibliographical material, case studies, ideas, debates, etc.

Savants, however, were not only readers of the periodical learned journals: some of them were also among the authors. This is of course specifically the case for *The Philosophical Transactions*, but also for more general journals. Mathematicians Johann Bernoulli and John Keill, as regards the priority dispute on the calculus, were even writing for the *Journal littéraire*, that so far had lacked mathematical contents. But not all savants were interested in publishing their works in learned journals, as the example of d’Alembert treating them as “torche-culs périodiques” clear shows. Leonhard Euler titled them “chicaneurs publics” and although he too was reluctant to contribute to the journals, he understood quite well how to make a strategic use of them. Astronomers from Geneva, as René Sigrist has shown, did not publish much in journals until the

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17. In a letter kept at the BnF, NAF 25261, fol. 27-28.
end of the century when a local journal came into existence. This volume does not yet offer a ‘big picture’ of when and where scientific practitioners made extensive use of learned periodicals. Is the existence of a local journal – even a general one – an important factor in the choice of a vehicle for publishing? This question has yet to be answered.

Moreover, when contributing to learned journals, do savants address their colleagues, through the periodical press, their colleagues or do they popularize their findings for a larger audience? They evidently do both. Further studies are required in order to situate the periodical form in a larger context of popular writing and its other literary genres.

Science Going Public

The complex process that transformed scientific knowledge in early modern Europe, especially in the 18th century, into a public phenomenon, is analysed here at different levels. From a political point of view, the ties between scientific research and state power had become more and more strily, according to an evolution that followed different chronologies in different European countries, depending on the degree of centralization attained within each State system (this problem emerges in a number of articles, but particularly in the essays by Maria Conforti, Charles-Henri Depezay, Erika Luciano, and Fernando Reis). The beginning of a science policy based on the recognition and support of institutions, such as societies, academies, periodicals, as well as on the orientation of research, was founded on the acknowledgement of the public utility of science. Not by chance, state financing rewarded research linked to local resources and to the development of each economy. At the same time, this recognition was also the result of the spreading of scientific culture among a public that included ever larger groups. If the reference public of the first learned periodicals edited in the second half of the 17th century was constituted by savants, it gradually came to include, besides the female public, middle class and, in some cases – above all in Protestant Europe – lower classes and popular groups. In this sense, the adjective ‘public’ indicates both the state dimension of the phenomenon, that is, the involvement of the political space as opposed to the private one (the Russian and the Swedish examples studied by Ingemar Oscarsson and Olga Valkova are significant), and the involvement of a public of a constantly expanding public of readers. It is thus necessary to emphasize that the birth of learned periodicals was a phenomenon contemporary to the evolution of the early modern state, that many countries in the late 17th and in the 18th centuries recognized a turning point although towards the centralization of power.

The question of the public is studied in the third section, many other articles invite deal with the topic of “science going public” in a much broader way. Relationships between periodicals were very important in promoting the circulation of ideas through the periodical press. Interplays between journals could take different forms, from the quotation of a discovery in the news, for instance, to the
translation of an entire article. Connections between periodicals, on the one hand, and academies and universities, on the other, are in fact equally as important. These connections refer to a circular process: in European academies scientific periodicals were often read and commented upon (see Erika Luciano on Turin Academy of Sciences at the end of 18th century) while periodicals published academic memoirs or their abstracts, along with the announcement of academic awards, sometimes speeding up the publication of academic proceedings and addressing the articles to a wider public. In the German world, where the model of university as research centre predominated, this institution played a prominent role, both because professors promoted learned periodicals (see Anne Saada on Albrecht von Haller) and because they used periodicals in order to advertise their books (see Martin Gierl on professors at Goettingen University).

The notion of ‘public’ is not to be interpreted only as the ensemble of readers thanks to the role of oral mediation, eventually the contents of the articles could whereby reach other listeners (see Patrizia Delpiano on the Italian context). In any case, readers were by no means passive – their expectations, analysed through the letters to the editorial board, could directly contribute to change journalists’ orientations or, at least, some of their aspects (in particular see the article by Thomas H. Bromon on Johann August Unzer’s Der Arzt, published from 1759 to 1764). The corpus of letters written by readers, particularly important in some contexts (as in Switzerland and Germany, studied by Miriam Nicoli using as a source the Journal de Lausanne, 1786-1792), deserve further in-depth examinations with the aim to verify the possible existence of a writing code – that is a group of implicit rules which apply according to the model of private epistolary communication.

Scientific Journalists

As defined in the Dictionnaire de Trévoux (1721), the journalist was either the one who makes the journal or the one who works for it. Diderot in the Encyclopédie, some thirty years later, described him more precisely as “an author whose occupation is to publish extracts and judgements on books in literature, in sciences and the arts, progressively as they are published”. The journalist therefore belongs to a wider category of authors, he is not writing books himself but reporting on and criticising them. Diderot himself refers the reader to his entry “critique”, thus implying that the journalist contributes to update in a regular fashion the historia literaria (cf. Martin Gierl’s work in this volume). As far as scientific journalism is concerned – that is, the reporting on scientific books, – no specific figure of a professional journalist emerges from the contributions to this


volume. In the 18th century, there is no evidence of a standard curriculum to embrace the career of a journalist. On the contrary, we have a whole range of figures, from the low-brow scribbler to the scientist himself. Thus Carl Christoffer Gjörwell, an editor of the Swedish Lärda Tidningar (1745-1773), who had a modest academic career, was regarded with some disdain by the learned establishment (cf. the contribution of Ingemar Oscarsson to this volume). At the other end of the spectrum, Samuel Formey, member and secretary of the prestigious Berlin Academy of Sciences, authored the journal Nouvelle bibliothèque germanique, to which he gave a more scientific outlook. Henri Du Sauzet, to give another example of the diversity we encountered, was a French-born bookseller in The Netherlands who decided to launch a journal, entitled Nouvelles littéraires (1715).

However, if we pay close attention to the professional and educational background of the ‘journalists’ we encounter in the case studies of this book, it becomes obvious that specific skills were necessary for a journalist. This is definitively the case in terms of linguistic skills, as most of the journals aimed to report on foreign books and to print news from abroad. Journalists had often acquired these skills while making their Grand Tour. This tour was also an opportunity to establish contacts across Europe, as the example of Eric Benzelius, theologian and librarian in Uppsala, shows: He had already built up a European network on his tour in 1697-1700 before authoring Acta literaria Sueciae (1720-1742). As far as French-speaking journalism is concerned, the role of the Huguenot refugees cannot be downplayed. The examples investigated in this volume, concerning the Huguenot pastors Jacques Bernard, authoring the Nouvelles de la République des Lettres in 1699, run by Pierre Bayle from 1684 to 1687, and Étienne Chauvin, editing the Nouveau journal des sçavans, first in Rotterdam and then in Berlin, confirm the results of earlier studies (cf. Hans Bots and Christiane Berkvens-Stevelinck).

There are hints in this book that physicians played a significant role in the creation of general learned journals, although the phenomenon has not yet been precisely assessed nor explained. Antonio Vallisneri, a university lecturer at Padova renowned for its high medical culture, was among the founders of the Giornale de’ letterati d’Italia in Venice. In the second half of the 18th century, Albrecht von Haller was contributing a significant number of book reviews to the Goettingische Anzeigen von gelehrten Sachen (founded in 1739). Michele Tenore graduated in medicine and published the Giornale enciclopedico (1806-1821) in Naples (Maria Conforti). Among the Portuguese émigrés of the turn of the century who founded learned journals in exile, there is a high number of journalists having a degree in medicine – and also of free masons (Bernardo José de Abrantes e Castro, Vicente Pedro Nolasco da Cunha, Francisco Solano Constâncio et al., all studied by Fernando Reis).

More generally, scientists contributed in different ways to the making of journals. Some were eager to create their own journal, such as the mathematician Carl Friedrich Hindenburg did (cf. Maarten Bullynck); while others despised journalists and refused to write for journals. In this respect, the case of the Journal de
Lausanne (studied by Miriam Nicoli) is extremely interesting since. Lanteires, its founder, failed to obtain contributions from the members of the Société des sciences physiques de Lausanne. With the rise of specialised journals, scientists played an increasingly great part in the movement. Luigi Brugnatelli, for instance, who dominated the chemistry scene in Italy, had important activities as a journal editor aimed at promoting his own opinions on gas theory (Raffaella Seligardi). In Naples, towards the end of the century, groups of reformist scientists gathered in order to promote various journals (Maria Conforti). The Giornale letterario di Napoli (1793-1799) was the expression of a group centred on the Tuscan émigré, the physician Luigi Targioni. In Prague, a patriotic society of savants gathered with the aim to publish their own scientific findings and to promote the culture of Bohemia. This society was at the origins of the later Böhmische Gesellschaft der Wissenschaften, founded with royal support (Helga Meise).

In summary, different patterns for the ‘authors’ of journals can be described: middlemen or intelligencers like Oldenburg, savants and experts like Brugnatelli, theologians like Mencke, librarians like Benzelius or Gjörwell. But journals were often the product of collective efforts too. In many instances, we see groups of savants gathering in order to publish their own work or to promote the local production of knowledge.

This volume is more reticent than we should wish on the concrete working methods of early modern ‘journalists’. The sources for a precise description of the daily management of a scientific journal, sadly, are often lacking. Besides ‘authoring’ contributions to their journals, journalists are described establishing and sustaining international networks through letter-writing and sometimes travel (in the papers of Christiane Berkvens-Stevelinck and Hans Bots). Anne Saada, pursuing her work on Albrecht von Haller and the Goettingische Anzeigen von gelehrten Sachen, explores the question of the financial support of journalists’ activities and offers some very interesting glimpses into the accounts of the journal.

The Rise and Fall of Journals

Turning now to the topic of the lifespan of periodicals, it is necessary to emphasize the great chronological heterogeneity of the different initiatives described in this volume. Some periodicals existed over a long period (the Journal des Savants, for instance, was published from 1665 to the present, although not regularly); other periodicals had a very brief life span. Many factors contribute to the explanation of the variety of lifetimes of the learned periodicals studied in this volume, both their success and their failure. In general, yet not surprisingly, the existence of institutional structures or networks recognised and financed by political power (societies and academies) contributed to consolidate these journalistic enterprises. The case of Acta eruditorum, edited from 1682, the existence of which is partly tied to the patronage relation to the Saxon court, is meaningful (see Uwe Mayer). The lifespan depended also on the role played by science policy.
inside the European states as well as on the financial stability that could decline in some circumstances, during wars for example. Apart from political power and support, the degree of cohesion among the members of the editorial group and the extension (local, national, international) of networks were very important. In fact, the more solid network was, the more it was able to ensure the covering of information at a European level. Surely a considerable factor is the existence of a public of readers, exceeding a local or even national audience. One example offered by the German mathematical journals studied by Maarten Bullynck shows that the absence of a public made it difficult to publish these periodicals over a long period of time; an even stronger hindrance was of course the absence of a mathematical community. But the existence of a public of readers was by no means guaranteed in some peripheral contexts of early modern Europe. In this sense, the degree of literacy helps us to understand significant differences between Northern Europe and Southern Europe, as well as between urban and rural centres, or between men and women. Of course, the situation was not static over the course of time: the evolution of educational systems in the second half of the 18th century, especially changes to primary schools, also implied a greater number of literates and of potential readers in countries that had previously been less concerned by the process of literacy, like Italy, Portugal, and Spain. It is important not to disregard the development of the printing press industry (as Olga Valkova shows for the Russian context) and the role of local publishers and printers able to assure regularity in publication. A further factor to be considered is the freedom of the press, a topic scarcely addressed, if at all, in this volume: it would be worthwhile to deepen our understanding of the role of censorship and the possible differences between Catholic and Protestant Europe from the point of view of learned periodicals.

Languages, Borders and Spaces

Many articles in this volume deal with the ‘spatial’, that is, geographical and linguistic issues. We are obviously referring to cultural aspects of geographical divides; actual borders and political, national (and often religious) distinctions could be just as important for the production and diffusion of learned journals. But the issue is in fact much broader than just that of material constraints, patronage, means of financing, and – when applicable – of censorship.

It is apparent that the linguistic choices of the journalist/s were by no means unpredicated or perfunctory. Choosing a language implied choosing an audience and even, in a certain sense, contributors; this must be taken not only in the obvious geographical sense, but also –and especially so in the first century of the history of learned journals – in the sense of the choice of a specific level of literacy and scientific skills. The very first periodicals, despite addressing themselves to a learned public, were not written in Latin, but in French, English, and Italian. The Acta eruditorum, on the contrary, were written in Latin, in order to gain an international audience and reputation, as in fact they did, but also to point to a
highly educated, academic audience. As editor from 1682 to 1707, Otto Mencke, also struggled to gain a reputation for impartiality for his journal (Uwe Mayer); arguably, Latin helped in the latter case too, being the language reserved use for learned and scientific exchanges and far from moribund in this role. Using Latin tacitly implied the use of an etiquette that did not avoid controversies, but placed them in the right light.

Latin as a means of scientific exchange was soon to be generally (that is, far beyond the world of learned journals) accompanied, if not replaced, by national languages: this process may have indirectly hindered international exchanges, but it certainly helped communicating within, if not directly creating, specific national communities and groups actively pursuing scientific research. In other words, linguistic choices in the journals helped to animate debates and create networks even in peripheral or underdeveloped (from the point of view of science) countries. This is one result of this volume; while not entirely unexpected, it is nonetheless remarkable, that even languages one would not imagine to be ready for scientific communication could in fact be used for this purpose. Such is the case of Swedish and Russian journals in the late 18th century (see Ingemar Oscarsson, Olga Valkova). The choice of the language certainly also had political undertones, as in the case of the Bohemian journals published in German in Prague, especially the Prager gelehrten Nachrichten, established in 1771 (see Helga Meise); in the sensitive areas around the Czech capital multilingualism called for a local lingua franca.

The emergence of national languages meant that translations – and translators – became one of the main issues related to journal publishing. Translating articles from other journals was very typical; charting translations could enable the appraisal of a hierarchy of journals, an early – modern ‘citation index’ of sorts. The widespread fortune of French periodicals and of the French language as the language of science, are a commonplace: as this volume shows, they ran along more or less parallel lines. The interplay between journals is thus, in many cases, a kind of hegemony of the major ones on the smaller or more locally centred. As the case of the Journal des Journaux (Charles-Henri Depezy) shows, even the use of French and the spreading of news and comments coming from Paris could have a political and cultural meaning, much more than a strictly scientific one. At the other end of the spectrum, at the crossroads between scientific specialisation and journals, the exemplary story of the late 18th century Dijon chemical translations from Swedish and other languages into French (Patrice Bret) demonstrates how translations and subsequent publications by experts could go as far as to help shape and transform disciplines themselves.

Finally, spaces, and even states and borders, can be also envisaged as immaterial and symbolic. One of the main underlying questions addressed in this volume is, to what extent did the learned journals participate in, and help create a république des sciences? Many articles point to the fact that learned journals were increasingly perceived as the privileged means of communication in this space, alongside epistolary exchanges, academic gatherings, and so forth. In fact,
the journals seemingly reflect a movement towards a more scientific character of the traditional république des lettres (for a more pointed use of the term république des sciences, see especially Christiane Berkvens-Stevelynck, Jens Haeseler, with a slight difference in chronology).

Some Shifts in the Big Picture

One of the more frequently discussed questions regarding historical reconstructions of the origins of the format, or genre, of learned/scientific journals is the one of their almost contemporary appearance at different locations in Europe. Should we assume that the Journal des Savants, as the very first to be published, represented in fact a model for the others? While this opinion has been held by authoritative scholars, mainly coming from French-speaking countries (see e.g. Gardair 1984), the very existence of the Philosophical Transactions (whose absence from this collection is regrettable), shows in our opinion that journals developed from the beginning of their history, following a variety of patterns, models, and styles of scientific communication. While some of them can be considered common, many of them, on the contrary, were peculiar and idiosyncratic. Some of the more interesting cases are those where the common model of a periodical published by collecting items of interest and presenting them to a public was shaped to meet specific needs: the need for a ‘tribunal’ to compose the controversies in the field of mathematics; the need for a self-help, middling-level, public discussion of issues related to therapeutics and health (see Thomas Broman); the need for a public, international self-fashioning of Italian science after the decades of hardship following the ecclesiastical condemnation of the ‘new’ science (Silvia Roero); the need for a new public to emerge without the constraints of academic science (Nicoli); the need for a group of enlightened and exiled men of science to establish a new relation with political power (see Maria Conforti, Fernando Reis).

It may even be argued that each and every journal represents a stand-alone story and model – this may appear as a mildly nihilistic stance as regards the need for a common model, and while we are far from endorsing such a view, we have nonetheless reached the conclusion that as regards the relation between science and learned journals no definitive generalization can be provided nor can any contention be safely held, except that periodicals (in the broad spectrum from learned to specialized) did in fact represent a major motivating force in fostering communication, the spread knowledge and even simple practice in fields such as medicine and mechanics, mathematics, earth sciences, chemical sciences, and antiquarianism. In fact, many journals were so short-lived, or characterized by such a local and limited outreach, that one may doubt whether they did impinge on the creation of a scientific community at a European level, sharing debates, results, and reputations. Despite this, one striking result of this volume is that while probably reaching only a small portion of the public, learned or not, even the more peripheral examples show a noteworthy participation to, and knowledge
of, the main scientific issues discussed by the better-known or most celebrated periodicals. The ‘lesser’ and ‘major’ journals (to use crude definitions) also normally share broad chronologies, such as regards the move towards specialization or the emergence and fortune of single disciplinary fields.

Our main ambition was to place the relationship between science and learned journals at the centre of the scene. The case studies included in this volume, with new hitherto unknown material, focus on European capital cities or on single journals (even if important areas like Spain, Austria, Hungary or Poland are missing). We are therefore far from being able to propose a big picture of the relationship between science and the learned press in a global world. More case studies, concerning especially those concerning local journals in rare languages are needed in order to delineate the major traits of this big picture. Nevertheless, the features that have emerged from the various contributions to this volume provide a better understanding of the interactions between the construction of knowledge and the periodical form. We hope that the many questions we have left unanswered – gender issues related to the scientific press, visual communication in early modern learned journals, censorship and especially self-censorship, among others – will open new research orientations and find appropriate answers in the coming years.

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