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Tools for Science: Libraries in Scientific Institutions in Eighteenth-Century France and Italy

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Abstract:
This article presents an overall reflection on the libraries that were assembled in scientific institutions in France and Italy in the eighteenth century using case studies and comparative approaches. It focuses in particular on five scientific academies (located in Turin, Florence, Paris and Brest) and two Florentine institutions, the Museo di Fisica e di Storia Naturale and the Santa Maria Nuova Hospital. Decisions made regarding library premises, book procurement policies, catalogue publications and whether or not to open to the public were all investments that demonstrated the role of the written culture in the identity of scholarly communities, including those (such as the naval and surgeons' communities) whose members had long been seen as professionals firmly rooted in a manual practice that was detached from theory. This article thus shows how libraries participated in the institutionalisation of scientific activities, the definition of professional knowledge and the formation of scholarly collectives.

Keywords: libraries, academies, scientific institutions, eighteenth century, Tuscany.

The aim of this article[*] is to lay the groundwork for a reflection on the collections of books assembled in scientific institutions in the eighteenth century. The term "scientific institution" here refers to premises on which science was practised (hospitals, astronomical observatories, botanical gardens, natural history museums) or taught (faculties of medicine, civil engineering, naval and military schools) or where intellectual work and scientific sociability occurred (academies). In the eighteenth century, the "government of science" established itself both as a tool for the effective management of the land and populations and as the instrument of the construction of a political consensus around a sovereign power that had been enlightened by scholars. These institutions spread throughout Europe to such an extent that the eighteenth century might be described as a "distinct era in the organizational and institutional history of European science."[1]

These foundations were accompanied by the establishment of material and intellectual instruments, including book collections. The Italian case is emblematic of an evolution that accelerated in the second half of the century. The majority of institutions founded during this period, such as the astronomical observatories of Milan (1764), Florence (1786) and Palermo (1790), the agricultural academies of Florence (1753) and Turin (1785) and Turin's Academy of Science, either immediately or gradually formalised their libraries.[2] There were also book collections in the naval and military schools, such as those at the royal artillery schools in Turin (1739) (which the traveller Thomas Martyn referred to in 1791 as a "library of books in mineralogy and metallurgy"), the military college in Verona (1763) and the cadet's school in Naples (1774).[3] Other older structures were also equipped with an institutional library, like the Santa Maria Hospital in Florence (1679) and the Santo Spirito Hospital in Rome (1711). Finally, while book collections had probably been assembled in botanical gardens since the sixteenth century in the Italian Peninsula, the reforms in the second half of the eighteenth century led to a clarification of their status and an expansion of their holdings, such as at the gardens in Parma, Padua, Pavia and Pisa. A similar revolution can be seen in England, where the number of scientific and medical libraries increased from the 1750 to the 1770s period onwards, although these were mainly supported by private initiatives.[4] In France, there was a

[*] Abbreviations used: AN: Archives Nationales, Paris; ARC: Académie de Médecine, Fonds de l'Académie Royale de Chirurgie, Paris; ASF: Archivio di Stato, Firenze; BIUM: Bibliothèque Interuniversitaire de Médecine, Paris; IMSS: Istituto di Museo di Storia della Scienze, Firenze.

[1] James McClellan, "Scientific Institutions and the Organization of Science," in *The Cambridge History of Science.* Vol. IV, *Eighteenth-Century Science*, edited by Roy Porter (Cambridge: Cambridge University Press, 2003), pp. 87-106: 87. See also Giulio Barsanti, Vieri Becagli, Renato Pasta (eds.), *La politica della scienza: Toscana e stati italiani nel tardo Settecento* (Firenze: Olschki, 1996).

[2] The dates given are those of the institutional foundation of the libraries. This is a non-exhaustive list compiled from Alfredo Serrai, *Storia della bibliografia.* Vol. X, *Specializzazione e pragmatismo: i nuovi cardini della attività bibliografica*, 2 vols. (Roma: Bulzoni, 1999), Vol. I, pp. 498-506. Some of the data from this source have been supplemented and corrected.

[3] Thomas Martyn, *A Tour through Italy* (London: Kearsley, 1791), p. 24. On the college in Verona, which was re-formed in 1759 and equipped with a library in 1763, see Carlo Farinella, "Una scuola per tecnici del Settecento: Anton Maria Lorgna ed il Collegio Militare di Verona," *Archivio Veneto*, 1991, *136*:85-121. On the Reale Accademia del Battaglione, founded in 1771, see Vincenzo Trombetta, *Storia e cultura delle biblioteche napoletane. Librerie private, istituzioni francesi e borboniche, strutture postunitarie* (Napoli: Vivarium, 2002), p. 407.

[4] John Symons, "Scientific and Medical Libraries: The Rise of the Institution," in *The Cambridge History of Libraries in Britain and Ireland.* Vol. II, *1640-1850*, edited by Giles Mandelbrote, K.A. Manley (Cambridge: Cambridge University Press, 2006), pp. 388-404.

turning point in the Revolution, which drew on the *dépôts littéraires* to form libraries in the new institutions, such as the École Centrale des Travaux Publics and the Conservatoire des Arts et Métiers, and the older institutions like the École des Ponts et Chaussées and the École des Mines.[5] However, the institutions of the Ancien Regime had already assembled book collections, either informally (the Jardin du Roi, the surgical schools in the maritime hospitals in Rochefort and Toulon, the veterinary school in Alfort) or in a more organised fashion (the Académie Royale des Sciences and the Académie Royale de Chirurgie in Paris, the Académie Royale de Marine in Brest).

The development of these libraries was part of the move to institutionalise scientific activities and establish them in well-identified locations in the urban space. In line with this localisation logic, there were also the phenomena of scholarly aggregation. The institution participated in the "creation of the collective."[6] This was the melting pot of a common identity, forged around references and practices that were assumed to be shared by a particular group, or which a group member wanted to share. Similarly, the setting-up of a library, which presupposed specific material, financial, organisational and intellectual efforts, was a means of giving visibility and functionality to the relationship between a group of individuals and a body of knowledge. When a library held the institution's archives or the personal papers of its deceased members, it was participating in the documentary construction of a shared history and the heritagisation of knowledge.[7] Beyond the utilitarian dimension of this working tool, the library was in effect a symbolic place that showed the importance of books in the public image of a particular group. A study of the investments made, which comprised the allocation of a particular premises, the appointment of a librarian, the publication of a catalogue and the opening of the library to the public, should not therefore be confined to an internal approach but should endeavour to determine the social and intellectual issues linked to the setting-up of this type of equipment.

Forms of institutionalisation: from the book collection to the library

The presence of books in the Ancien Regime institutions did not always amount to a library. Far from it. They were often collections, stored in the midst of other collections, that had been built up over a number of years in line with the establishment's needs and which had sometimes been paid for out of the staff's own pockets. This was frequently the situation in institutions with a small workforce, where the director identified closely with the establishment's fate. The Count de Buffon certainly left his mark on the small collection of books established at the Jardin du Roi de Paris, where he was intendant from 1739 to 1788.

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[5] Cécile Robin, *Au purgatoire des utilités. Les dépôts littéraires parisiens (an II-1815)* (PhD Diss., Université Paris-I, 2013), pp. 619-634. The École Centrale des Travaux Publics, which was founded in March 1794, became the École Polytechnique in September of that year. The Conservatoire was founded in October 1794, the École des Ponts et Chaussées, in 1747, and the École des Mines, in 1783.

[6] Franck Bessis, "L'institution comme réalisation du collectif," *Tracés. Revue de sciences humaines*, 2009, *17*:73-87. See also Stéphane Van Damme, *Paris capitale philosophique. De la Fronde à la Révolution* (Paris: Odile Jacob, 2005).

[7] Michael Hunter (ed.), *Archives of the Scientific Revolution. The Formation and Exchange of Ideas in Seventeenth-Century Europe* (Woodbridge: The Boydell Press, 1998). See also Stéphane Van Damme, "La passion des papiers philosophiques à Paris, entre patrimoine familial et monumentalisation nationale (XVIIe-XIXe siècle)," in *Du papier à l'archive, du privé au public. France et îles Britanniques, deux mémoires*, edited by Jean-Philippe Genet, François-Joseph Ruggiu (Paris: Publications de la Sorbonne, 2011), pp. 149-158.

The accounting records show that he reimbursed the botanist André Thouin, who was the establishment's gardener, for a proportion of the books constituting the little "library made up of a few natural history books" ("bibliothèque composée de quelques livres d'histoire naturelle"), which was mentioned by the reformers in 1790.[8] In the astronomical observatories in Florence and Palermo, the original libraries belonging to the establishments became mixed up with those of its founders and were only institutionalised on their deaths. The Jesuit father Leonardo Ximenès (1717-1786), founder of the observatory at the San Giovannino Jesuit college in Florence, assembled a large library at the observatory plus a collection of astronomical and physics instruments. His correspondence allows us to reconstruct the networks that participated in the expansion of the collections, from the leading Italian printer-booksellers to the Parisan Barrois and the Jesuit astronomer Esprit Pézenas of Marseille.[9] At the same time as the Jesuits were being expelled from Tuscany (1773), Ximenès was being given the power to retain the use of his accommodation and observatory in return for a promise that he would leave all his instruments and books to the state on his death. When he died, the library was attached to the college's chairs of astronomy and hydraulics, thus acquiring an institutional existence and escaping the sorting of the ecclesiastical collections that had been dispersed during the suppressions of the monasteries and convents. In Palermo, with no budget for books until 1822, the founder and director of the Observatory himself, Giuseppe Piazzi (1746-1826), gathered together the books (which he either bought or received from his correspondents) required for astronomical activities. The inventory drawn up in July 1826 by his successor — *Catalogo dei Libri dal P. Piazzi lasciati all'Osservatorio* — showed an effort had been made to clarify the status of the books, which, in the absence of institutional archives, had to rely on the ex-libris and handwritten annotations in the volumes.[10]

This confusion between the private library and public institution spheres arose as a result not only of material contingencies but also of an as yet fairly non-institutionalised conception of scholarly work and the status of research instruments. Many scholars shared the idea that the demands of scientific research justified a certain permeability of scholarly work places, which had to be able to function seamlessly from the laboratory to the *studio.* This position had a bona fide spokesperson in the form of Antonio Maria Lorgna, director of the military college in Verona, who felt that if certain pieces from the natural history museum at the University of Pavia were found in the personal collections of its director, Lazzaro Spallanzani,

[8] AN, AJ^{15}* 419. "Décembre 1774. Payé pour le Cathechisme d'agriculture dont Monsieur le Comte de Buffon ma présent [*sic*] la somme de deux livres" (p. 51). "Mai 1775. Payé à M. Aublet pour son ouvrage des Plantes de Cayenne dont Monsieur le Comte m'a fait présent de la souscription en me chargeant de retirer l'ouvrage, la somme de trente six livres" (p. 57). The citation is taken from Broussonnet, *Réflexions sur les avantages qui résulteroient de la réunion de la Société royale d'agriculture, de l'École vétérinaire et de trois chaires du Collège royal au Jardin du roi* (Paris: Imprimerie du *Journal Gratuit*, sans date). On the work of Thouin, Emma Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago: University of Chicago Press, 2000).

[9] Biblioteca Nazionale Centrale, Florence, Fondo principale, II.–.297-302 (inventoried by Carlo Triarico in *Nuncius*, 1998, *13*:209-245). Danilo Barsanti, Leonardo Rombai, *Leonardo Ximenes. Uno scienziato nella Toscana lorenese del Settecento* (Firenze: Edizioni medicea, 1987); Danilo Barsanti, *La biblioteca di Leonardo Ximenès: la cultura di uno scienziato del 18. sec* (Firenze: Osservatorio Ximeniano, 1988).

[10] Giorgia Foderà Serio, Donatella Randazzo, "The Origin of the Palermo Astronomical Observatory Library: Giuseppe Piazzi's (1746-1826) Books," *Library and Information Services in Astronomy III*, *ASP Conference Series*, 1998, *153*, www.stsci.edu/institute/conference/lisa3 (accessed 7 Mar. 2017).

they were there "con quello stesso diritto col quale un pubblico bibliotecario ha qualche volta in sua casa de'libri della pubblica Libreria, idest a fine di studiarli."[11] In this case, as in other similar cases of the time, the transformation in administrative requirements, which were particularly clear in the Viennese cameralism areas of influence, meant that this confusion became unacceptable for the power and led to a clearer separation of the private library and public institution spheres.[12] At the botanical garden in Pisa, this clarification resulted in the loss of the establishment's small collection of books to the university library's holdings in 1781. The books had been institutionally assembled at the garden since the sixteenth century. An inventory compiled in 1626 describes a collection of one hundred and ten volumes stored in the Galleria alongside the collections of natural specimens, exotic objects and curiosities founded by Ferdinand 1st.[13] Bound in parchment, the books bore the grand duke's coat of arms and were identified by an order number. They contained famous texts on botany from the sixteenth and seventeenth centuries, treatises on medicinal plants and their properties, chemical remedies, and inventories of medals and antiquities, which contributed to classificatory reflection and demonstrated the strength of the encyclopaedic collection model. From the 1630s onwards, the institution fell into decline and all purchasing stopped. An inventory dating from 1686, which was drawn up by the director Michelangelo Tilli when he first took up his post, listed only 99 books. The permanent presence of the Tilli family as directors of the gardens in the eighteenth century fostered a fairly opaque style of management at the institution, which manifested most notably in the near total absence of any stocktaking.[14] When Angelo Attilio Tilli disappeared in 1781, the books that belonged to the gardens were found to be mixed in with the directors' personal library ("confusi ed incorporati con la libreria della casa Tilli"), and there was no possibility of identifying accurately which had come from the institution. The only exceptions to this were the volumes inventoried in the seventeenth century, which Grand Duke Peter Leopold arranged to have deposited in the university library as an administrative adjustment measure.

Scholarly communities and the written culture

The creation (or not) of a library cannot just be reduced to the administrative vicissitudes of the establishment. It also raises the issue of the place of the written culture in the production of a collective identity and in the modalities of its self-representation. Historians

[11] Lazzaro Spallanzani to Anton Maria Lorgna, Pavia, 8 March 1787, in *Edizione nazionale delle opere di Lazzaro Spallanzani. Parte prima. Carteggi*, Vol. V, edited by Pericle Di Pietro (Modena: Mucchi, 1985), p. 345. Spallanzani was then accused of theft by its custode, Volta, and by a number of professors at the university.

[12] See also the public enquiry into Felice Fontana, director of the Museum of Physics in Florence, in 1791 regarding a collection of machines and specimens that had been stored at the museum but which he claimed to own. On these matters, see Emmanuelle Chapron, "Politique de la science et correspondances savantes au XVIIIe siècle. Les musées de physique et d'histoire naturelle de Pavie et Florence," in *La politique par correspondance. Les usages politiques de la lettre en Italie (XVIe-XVIIIe siècles)*, edited by Jean Boutier, Sandro Landi, Olivier Rouchon (Rennes: Presses Universitaires de Rennes, 2009), pp. 275-291.

[13] This collection has been the object of some specific studies: Ciro Sbrana, Lucia Tongiorgi Tomasi, "Una biblioteca scientifica a Pisa durante il granducato mediceo: i libri del Giardino dei Semplici," in *Livorno e Pisa: due città e un territorio nella politica dei Medici* (Pisa: Nistri-Lischi e Pacini editori, 1980), pp. 554-555, and Ciro Sbrana, "Per una ricostruzione dell'antica biblioteca del Giardino dei Semplici di Pisa. Nuovi elementi," *Physis*, 1982, *24*:423-435.

[14] Tiziano Arrigoni, "Per una storia delle istituzioni scientifiche nella Toscana del Settecento," *Atti e memorie dell'Accademia toscana di scienze e lettere La Colombaria*, 1988, *53*:115-218, pp. 184-190.

of medicine have for a long time highlighted how doctors have used the production and collection of books to establish their authority. The library at the Royal College of Physicians in London thus probably demonstrates the knowledge of its proprietors more than it participates in the advancement of knowledge.[15] Hervé Leuwers shows the role of bar association libraries in the promotion of a scholarly image for the legal profession and the reinforcement of its esprit de corps.[16] Conversely, other groups, such as surgeons and sailors, had long been seen as professionals firmly rooted in a manual practice that was detached from any theory, at a time when educational establishments linking theoretical training and practical studies were being developed for them.[17] The study of the academy libraries — institutions that were archetypal in projecting the image desired by the group and validated by the power — allows us to put forward in this reflection. The comparative approach includes the Académie Royale des Sciences (1666) and the Académie Royale de Chirurgie (1731) in Paris, the Académie Royale de Marine in Brest (1752), the *Georgofili* Academy of Agriculture in Florence (1753) and the Academy of Science in Turin (1783).[18]

The book occupied a central place in academic activities, from public lectures to publications printed either under the institutional printing privilege or with the academy's approval.[19] Its probationary and circulatory dimension turned it into a sign of recognition and belonging in a Republic of the sciences, which was seen as a community of readers exchanging ideas in discussions and publications. However, the library, as a stabilised resource of intellectual material, played a variable role in the academic machine. Most of the

[15] Scott Mandelbrote, "Professional Collections: Libraries for Scientists and Doctors," in *The Cambridge History of Libraries in Britain and Ireland.* Vol. II, *1640-1850*, edited by Giles Mandelbrote, K.A. Manley (Cambridge: Cambridge University Press, 2006), pp. 158-172: 171.

[16] Hervé Leuwers, *L'invention du barreau français, 1660-1830. La construction nationale d'un groupe professionnel* (Paris: Éditions de l'EHESS, 2006).

[17] On the surgeons, see Toby Gelfand, *Professionalizing Modern Medicine: Paris Surgeons and Medical Science and Institutions in the Eighteenth Century* (Wesport-London: Greenwood Press, 1980), and Christelle Rabier, *Les chirurgiens de Londres et de Paris, 1740-1815: économie, identités, savoirs* (PhD Diss., Université Paris-I, 2008). On the sailors, see *La Mer au siècle des Encyclopédies*, edited by Jean Balcou (Paris: Champion; Genève: Slatkine, 1987); Michel Vergé-Franceschi, *Marine et éducation sous l'Ancien Régime* (Paris: Éditions du CNRS, 1991), and Annie Charon, Thierry Claerr, François Moureau (eds.), *Le livre maritime au siècle des Lumières. Édition et diffusion des connaissances maritimes (1750-1850)* (Paris: Presses de l'Université Paris-Sorbonne, 2005).

[18] The history of the *Georgofili* academy — a small agricultural society founded in 1753 by Canon Montelatici — tracks the main events in the Habsburg-Lorraines academic policy, which set about recovering private initiatives and redistributing their expertise with a view to promoting "useful" knowledge. In 1767, equipped with a permanent president and its first bylaw, the academy was placed under the protection of Grand Duke Peter Leopold. In 1783, it became the *Accademia Reale di Botanica e di Agricoltura*, receiving a new bylaw and an annual grant of 400 *scudi*. It also took over the running of the botanical garden, welcoming members of the suppressed Botanical Society (Renato Pasta, "L'Accademia dei Georgofili e la riforma dell'agricoltura," *Rivista storica italiana*, 1993, *105*:484-501). In Turin, by contrast, the transformation into an academy of the small society established in 1757 around Count Saluzzo di Monesiglio showed the scholarly communities' success in using the utilitarian dimension of science (particularly in the military domain) to renegotiate the possibility of a collective activity that had been denied them by the authorities since the beginning of the eighteenth century (Vincenzo Ferrone, "The Accademia Reale delle Scienze: Cultural Sociability and Men of Letters in Turin of the Enlightenment under Vittorio Amedeo III," *The Journal of Modern History*, 1998, *70*:519-560). On the history of the other academies, see below.

[19] Erika Luciano, "Transmission of Scientific Knowledge and Editorial Policy at Turin Academy of Sciences in the 18th century," *Archives internationales d'histoire des sciences*, 2013, *63*:409-425.

time, it was a secondary or belated reality (Fig. 1).[20] Two academies — the naval officers' academy in Brest and the surgeons' academy in Paris — conferred a relatively important role on their libraries, which manifested in a more advanced institutionalisation. These libraries had a procurement budget and a librarian. They also received donations and regulated their opening to the public. Behind the material and intellectual contingencies that were specific to each institution (nomadism, absence of a grant, periods of turmoil), the proliferation in the signs of institutionalisation, or conversely the complete absence of them, nevertheless made sense.

Fig. 1. The scientific academies and their libraries in the eighteenth century.

	Académie Royale des Sciences, Paris	Académie Royale de Chirurgie, Paris	Académie Royale de Marine, Brest	Accademia dei Georgofili, Florence	Accademia Reale delle Scienze, Turin
Academy founded	1666	1731	1752	1753	1783
Suitable premises for the library	Around 1730	1730, moved in 1775	Provided for in the 1752 bylaw	Attested in 1794 in the *Palazzo Vecchio*	Requested in 1760
Procurement budget	No	La Peyronie grant (200 French *livres*/year)	Included in the general grant from 1752 onwards (mentions of book purchases)	Included in the general grant from 1783 onwards (mentions of book purchases)	Included in the general grant from 1783(?) onwards (no mention of book purchases)
Testamentary bequests	No	Le Prince (1730), La Peyronie (1747), Houstet (1782) Louis (1788)	No	No	No
Responsibility for the library	Treasurer then librarian (by 1784 at the latest)	Librarian from 1739 onwards	Secretary then library guard (by 1765 at the latest)	Correspondence secretary	Permanent secretary
Opening to the public	No	Yes (to surgeons), theoretically in 1730, effective in 1775	1771	No	No
Inventories	1744, 1765, 1784	1739, 1751	1761, 1766		
Publication of catalogue	No	No	Yes (1783)	No	No

[20] Part of the information in the table has been drawn from the available bibliography. Annie Chassagne, *La bibliothèque de l'Académie royale des sciences au XVIIIe siècle* (Paris: Éditions du CTHS, 2007). On the Académie de Chirurgie library, see Christelle Rabier, "Occupational Tools? Surgeons' Libraries in 18c France and Britain," paper communicated personally by author. On the Brest library, see Alfred Doneaud du Plan, *Histoire de l'Académie de Marine* (Paris: Berger-Levrault, 1878-1882), and Rémy Le Page, "La bibliothèque de l'Académie de Marine," in *La Mer au siècle des Encyclopédies* (cit. note 18), pp. 135-145.

Holdings	260 titles (1744) Approximately 1,000 vol. (1765)	726 titles (1739), 1,510 titles (1751)	1,888 titles (1788)		

Stéphane Van Damme highlighted the fact that the foundational periods offer an ideal opportunity to "return to the source of the creation of collectives to outline the spectrum of logics localising philosophical activity."[21] The libraries, which contributed to the ideal of academic form, were part of the first collective amenities ever envisaged. In Florence, the bylaw proposed by Giovanni Targioni Tozzetti in 1756 for the *Georgofili* included the full optimal range of academic instruments. It provided for an archivist as well as a librarian and the creation of a warden post for both the museum and the botanical garden.[22] The case of the Académie Royale de Chirurgie was exceptional in that the foundation of its library preceded that of the scholarly society. In June 1730, a former army hospitals surgeon Antoine Le Prince bequeathed a sum of 4,000 French *livres* to the community of surgeons at the Collège de Saint-Côme "to begin to establish a library for the use and education of the masters and students" ("pour commencer l'établissement d'une bibliotèque pour l'utilité et l'instruction des maîtres et des aspirans"). A quarter of this sum was to be used to build shelving, and the remainder was to be dedicated to "the purchase of books, particularly on the subjects of surgery and the other arts" ("en achat de livres concernant surtout la chirurgie et les autres arts").[23] The library was, in fact, managed by the Académie de Chirurgie, which was made an independent institution the following year albeit maintaining close links with the college.

The initial intentions led to forms of libraries that were institutionalised to varying degrees. The allocation (or not) of premises suitable for books was a primary differentiating factor. The premises assigned to the academies did not always allow the collections to be displayed properly. The Académie Royale des Sciences, which was installed in the Louvre in 1699, only had use of the large antechamber of Louis XIV's former apartment at first. When three other rooms were added onto it around 1730 with a view to setting up a natural history exhibition room, the books were stored in two and then just one of these rooms, which were moreover crammed with skeletons, jars and machines.[24] Referring to the "library of this academy, which has been formed in part from its own collection of books" ("bibliothèque de cette Académie, formée en partie de la collection de ses ouvrages"), the *Almanach du voyageur à Paris* described a lot of clutter, which was not very conducive to working on the premises.[25] This model was explicitly used in the Turin plan presented to the king in June 1760, which requested the use of a room that was "fairly big for meetings, plus a backroom that would serve as a storage area for books, papers, machines etc." ("un peu grande pour les assemblées,

[21] Van Damme, *Paris capitale philosophique* (cit. note 7), p. 41.
[22] Plan published by Piero Bargagli, "L'Accademia dei Georgofili nei suoi più antichi ordinamenti," *Atti della Real Società Economica di Firenze ossia de' Georgofili*, 1806, *3*:387-501, pp. 473-490.
[23] BIUM, ms. 2094, *Copie d'une donnation de quatre mille livres par M^r le Prince du 16 juin 1730 pour l'établissement d'une bibliotèque à l'Académie royale des chirurgiens jurés de Paris* (1739), p. 1.
[24] Chassagne, *La bibliothèque* (cit. note 21), pp. 41-42, and Camille Frémontier-Murphy, "La construction monarchique d'un lieu neutre, le logement de l'Académie royale des sciences au palais du Louvre," in *Règlement, usages et science dans la France de l'absolutisme*, edited by Christiane Demeulenaere-Douyère, Éric Brian (London-Paris-New York: Éditions Tec & doc, 2002), pp. 169-203.
[25] Luc Vincent Thiéry, *Almanach du voyageur à Paris* (Paris: Hardouin, 1787), p. 62.

et une arrière-chambre, qui serviroit d'entrepôt pour les livres, papiers, machines etc.")[26] This was, on the whole, quite a recurring configuration, however, which had been in evidence since the creation of the Royal Society of London.[27]

The nomadism of some academies was a second major obstacle to the existence of a suitable premises for their books. In Florence, the absence of a fixed headquarters prevented any institutional consolidation of the books and essays assembled by the academics for a long time. The true installation of the library seems to date to 1794, after the academy had been given new premises in the renovated apartments of Pope Leo X at the *Palazzo Vecchio*. The presence of a vestibule furnished with shelving meant that a *Biblioteca Accademica* could be set up and that the books that had been stored up to that point by the director of the botanical garden and the correspondence secretary could be brought together.[28]

The issue of having access to premises specifically for books arose earlier (although their operationalisation was far from immediate) at the Académie de Chirurgie in Paris and the Académie de Marine in Brest. The first bylaw concerning the academy in Brest provided for a small room to be dedicated to the "deposit of books, registers and essays" ("dépôt des livres, registres et mémoires") with another reserved for "models, machines and instruments" ("modèles, machines & instrumens").[29] Was the company as well installed as this bylaw would seem to imply, however? It is doubtful. A draft bylaw drawn up in 1775 mentions an unpleasant, cramped and noisy environment and asks that the academy is allocated "another accommodation comprising several rooms and apartments for its meetings, library and exhibition rooms" ("un autre logement composé de plusieurs salles et appartements pour ses assemblées, sa bibliothèque et ses cabinets").[30] The surgeons in Paris were also slow to make suitable provision for their library. The books were placed in the students' hall at the Collège de Saint-Côme while the college was waiting to be allocated the premises provided for by the donation in 1730. In reality, the library remained "piled up without order and thus without utility in a kind of hovel, where it has been forced to accumulate, also to no avail, anatomical objects and preparations, instruments and machines" ("entassée sans ordre, et par là même

[26] *Il primo secolo della R. Accademia delle Scienze di Torino. Notizie storiche e bibliografiche (1783-1883)* (Torino: Stamperia reale di G. B. Paravia, 1883), p. 13.

[27] According to its first historiography, written by Thomas Sprat (*History of the Royal Society*, 1667), Gresham College had conceded to the Society "one *publick Room* to meet in, another for a *Repository* to keep their Instruments, Books, Rarities, Papers, and whatever else belongs to them" (Mordechai Feingold, "Of Records and Grandeur: The Archive of the Royal Society," in *Archives of the Scientific Revolution* [cit. note 8], pp. 171-184: 174).

[28] *Atti della Real Società Economica di Firenze ossia de' Georgofili*, 1795, *2*:6-7 ("Questa nuova residenza avendo un vestibulo corredato di comode e decenti scanzie, ci à procurato il vantaggio di poter ivi adunare i nostri libri, parte già depositati per compenso nelle mani del Direttore dell'Orto Sperimentale, e parte in quelle del Segretario delle Corrispondenze. In cotal guisa *si è dato principio ad una Biblioteca Accademica*, la quale andando crescendo potrà servire ai nostri Socj in processo di tempo, di stimolo, e d'incoraggimento a sempre nuove intraprese" — my emphasis). A room in the *Palazzo Vecchio* had been given to the Academy in March 1767, but the meeting still continued to take place in Count Rosemberg's palace (*Atti*, 1791, *1*:28).

[29] *Règlement pour l'établissement d'une Académie de Marine, au port de Brest* (Paris: Imprimerie Royale, 1752), art. XXIX.

[30] AN, Marine, G 93, fol. 69: "Mr de Sartines a vu dans son séjour à Brest combien le logement de l'Académie étoit désagréable, par son peu d'étendue, son obscurité, le bruit inséparable du voisinage d'un bassin. Il a si bien senti la nécessité d'un bâtiment, qu'il a eu la bonté d'assurer l'Académie qu'il en ferait plutôt bâtir un tout exprès, s'il ne s'en trouvait pas dans le port." While waiting, the academy had to assemble "in the common room" ("dans la salle ordinaire"). They were given a second room in 1777, which they dedicated to the models (Doneaud du Plan, *Histoire de l'Académie de Marine* [cit. note 21], fasc. IV, p. 82).

sans utilité, dans un espèce de galetas où l'on étoit obligé d'accumuler égallement à pure perte, les pièces et préparations anatomiques, les instrumens et machines") until its installation in the new buildings when they were opened in 1775.[31] In the buildings located in the current Rue de l'École de Médecine, the library had a long room measuring 94 feet by 18 on the first floor, which looked out onto the Rue des Cordeliers (Fig. 2 and 3). It was so large relative to the holdings that is also hosted the surgeon Antoine Louis's books.[32]

Fig. 2. Plan of the first floor of the Écoles de Chirurgie, in Jacques Gondoin, *Description des Écoles de chirurgie dédiée à Monsieur de La Martinière* (Paris: P.-D. Pierres, 1780), plate VII.

Fig. 3. View of the library from the Écoles courtyard, in Jacques Gondoin, *Description des Écoles de chirurgie dédiée à Monsieur de La Martinière* (Paris: P.-D. Pierres, 1780), plate XIV.

The second difference between the academies related to the ways in which they increased their holdings. At the Académies des Sciences in Paris, Turin and Florence, the books mainly came from academic exchanges and consignments from scholars wanting to make themselves known to the institution. There were no regular budgets or special legacies available to expand the holdings.[33] In Florence, for example, the academy had no regular revenue prior to 1783 except for the small subscriptions from its members. In 1783, the new bylaw provided for book purchases, but the grand-ducal grant of 400 *scudi* (around 2,000 French *livres*) appears not to have been enough to allow real growth in the holdings given the other responsibilities the institution had (particularly the maintenance of the experimental garden).[34] The Académie Royale de Marine in Brest and the Académie Royale de Chirurgie in Paris differed from the rest in two ways. First, they had an immediate budget available for book purchases. In Brest, the 1752 bylaw stated that the annual grant (originally fixed at 6,000 French *livres*) would have to be partly assigned to growing the library. During the same period, purchases were made in Paris through the academician Lefebvre, secretary of the

[31] ARC, box 9, file 9, n° 2, La Martinière to the controller general, undated [1774]. See the premises' inventory, *ibid.*, box 10, file 25, n° 1, "Etat en quoj consiste la Bibliotéque," undated but probably from this first period. In 1739, the Company noted that the books were "in such disarray that they cannot possibly bring any benefit to the company's members" ("dans un tel dérangement, qu'ils ne peuvent apporter aucun fruit aux membres de la compagnie") and nominated a librarian, Henriques, to compile a catalogue of them (BIUM, ms. 2094, *Extrait des registres… contenant les délibérations de la Compagnie. Du mercredy 11 février 1739*).

[32] Rabier, "Occupational Tools?" (cit. note 21).

[33] All the subsidies provided for in the Paris Académie des Sciences bylaw were given over to experimentation and observation. Indeed, no book purchases appear in the academy's routine expenditure, but the many reimbursements for the carriage of books indicate the importance of exchanges with other academies in Saint Petersburg, London, Stockholm and Brussels (Chassagne, *La bibliothèque* [cit. note 21], pp. 33-38, which moreover highlights how slow the process of institutionalising these long-time interpersonal exchanges were). Along the same lines, the Turin plan of 1760 did not provide for a books budget but requested tax exemption on letters and parcels. The first purchases only date to 1790, even though donations had increased in 1784. Online inventory of the academy's archives, www.accademiadellescienze.it/biblioteca_e_archivio (accessed 7 Mar. 2017).

[34] *Atti della Real Società Economica di Firenze ossia de' Georgofili*, 1791, *1*:58-59, by law of 22 October 1783, article V: the correspondence secretary "averà facoltà di provvedere i libri relativi agli oggetti nostri." The *Atti* recorded a number of books sent as donations.

Bibliothèque Royale. The books arrived in Brest in 1753, 1756 and finally, rather late, in 1764 at a total expenditure of more than 6,000 French *livres*.[35] Following the interruption to funding and academic activity during the Seven Years' War, the academy was re-founded in 1769 and engaged in an informed policy of updating its collections. Purchases were either decided in meetings or based on lists drawn up by the academicians. The Parisian booksellers Delatour and Durand, who had been approached by the academy to supply foreign books, were replaced by Malassis of Brest, their correspondent, who became the academy's representative of choice. Purchases (which totalled nearly 3,000 French *livres* per annum between 1785 and 1787) were also made at auctions as well as through officers located abroad, academic correspondents and occasionally Parisian booksellers. The collection had increased from 1,018 books in 1781 to 1,888 in 1788, representing an exponential procurement rate of more than 125 titles per year on average in contrast to the 35 in the previous period.[36] The Académie Royale de Chirurgie in Paris had a fund of 3,000 French *livres* bequeathed to it in 1730 by Antoine Le Prince as well as an annuity set up in 1747 by François de La Peyronie, Louis XV's chief surgeon, which the surgeons were obliged to withdraw 200 French *livres* from for book purchases.[37] The second way in which these two academies differed from the rest concerned the large legacies left to them. The Académie de Chirurgie was expanded by La Peyronie's library in 1747, Houstet's library in 1784 (Houstet also bequeathed 2,000 French *livres* to expand it further) and Antoine Louis's library in 1788, although his legacy was annulled by a second will.[38] Louis Sébastien Mercier's estimate of "around ten thousand volumes" ("d'environ dix mille volumes") in his description of the library in *Tableau de Paris* is perhaps excessive, but it nevertheless reflects the rapid increase in the holdings.[39] Conversely, the Académie Royale des Sciences' members did not leave their books to the academy but to the faculty of medicine (this was the case for Helvétius, Winslow and Chomel) or the college of surgery (such as La Peyronie).[40] The Brest Académie's registers show the importance throughout of individual donations. These were moreover encouraged by the bylaw, which stated that "there will be mention on the Académie's registers of those enlarging its collections in this way" ("il sera fait mention sur les registres de l'Académie, de ceux qui auront ainsi augmenté ses collections").[41] This same request was not to be systematically made of the Académie des Sciences members until the 1780s, albeit it met with less success.

The library was sometimes used to preserve the academy's organic archives (legal documents, minutes of meetings, official correspondence) as well as working papers produced

[35] Doneaud du Plan, *Histoire de l'Académie de Marine* (cit. note 21).
[36] *Catalogue des livres de la bibliothèque de l'Académie royale de marine, fait en 1781* (Brest: Malassis, 1781).
[37] BIUM, ms. 2010 and 2094. The receipts that have been preserved show a lower expenditure as follows: 70 French *livres* per annum on average between 1751 and 1758, including the costs of binding and cataloguing; 130 French *livres* spent all in one go at the end of the 1760s; 510 French *livres* between 1782 and 1785 from the Houstet legacy, including purchases made at the Tronchin sale (ARC, box 9, file 13 and box 11, file 46 and 63).
[38] Extract from La Peyronie's will in BIUM, ms. 2010. On Louis, see Rabier, "Occupational Tools?" (cit. note 21).
[39] Louis-Sébastien Mercier, *Tableau de Paris*, Vol. IX (Amsterdam, 1789), p. 113. The library held 726 titles in 1739 (BIUM, ms. 2094), and the 784 La Peyronie books (nearly 1,400 volumes) were added in 1747.
[40] Alfred Franklin, *Recherches sur la Bibliothèque de la Faculté de Médecine de Paris* (Paris: Aubry, 1864), pp. 69-70.
[41] *Règlement pour l'établissement d'une Académie de Marine* (cit. note 30), art. XXXII, repeated in the 1769 bylaw. Doneaud du Plan has recorded the majority of these donations (cit. note 21).

or bequeathed by its members. The cramped premises and the definition of official functions meant that the archives and libraries often shared the same space, which would be overseen by the academic secretary. The incorporation of scholarly archives, such as those of deceased academicians, had to comply with two objectives, which were to collect works that were first and foremost a collective working tool and to construct a shared memory. As highlighted by Michael Hunter, the belief that the progress of science lay in the collective preservation of handwritten materials was one of the driving forces behind the institutionalisation of sciences from the 17th century onwards. However, it is important not to overestimate the programmatic nature of this accumulation. The warm welcome given to bequests at the Académie Royale des Sciences in Paris "should not be interpreted as evidence of a conscious policy to establish a *service des archives* […] for no obligation was placed on academicians to leave their scientific papers to the Académie des Sciences. Rather do they constitute a practice of accumulating papers on an *ad hoc* basis according to the testamentary purposes of individual academicians."[42]

The fact that the academies differed in terms of investment in their libraries cannot, however, just be related back to the variations in material conditions and individual acts of goodwill. As Luc Boltanski wrote, "in order to exist for itself and for others, a group must give, through its members or more precisely its spokespersons, representations of itself, dramatic accentuations […] of its pertinent traits, a sort of stylisation that contributes to the formation of a collective belief without which the group has no right to social recognition."[43] In this sense, the setting-up of a library within an institution that was as socially visible as an academy may be considered a "dramatic" attempt to signify this public relationship with the written culture. The Académie de Marine and the Académie de Chirurgie were the products of professional communities for whom the relationship with the book culture was still conflictual even in the eighteenth century. In 1762, the naval commander in Brest noted that "people in the navy hardly ever pride themselves on their knowledge; it is even ridiculed the majority of the time. I can see 150 caterers and innkeepers here [in Brest] who have all made their fortunes. There was only one bookseller, and he went bankrupt" ("on ne s'est guerre jamais piqué de connoissances dans la Marinne, et elles y ont même presque toujours été tournées en ridicule. Je vois bien icy [à Brest] 150 traitteurs ou cabaretiers qui ont tous fait fortune, il n'y avoit qu'un seul libraire et qui a fait banqueroutte").[44] The note is polemical, but some despondent souls reported the naval misfortunes of the Seven Years' War to the proliferation of "scholarly officers" (officiers savants). Conversely, the Académie said its aim was to promote the most theoretical of knowledge to support naval practices, which would otherwise

[42] Christiane Demeulenaere-Douère, David Sturdy, "Image versus Reality: The Archives of the French Académie des Sciences," in *Archives of the Scientific Revolution* (cit. note 8), pp. 185-208: 202. See also Michael Hunter, "Introduction," pp. 1-20: 3-5. At the Académie des Sciences, the archives were held by the secretary, while the library was managed by the treasurer and subsequently the librarian.

[43] Luc Boltanski, *Les Cadres. La formation d'un groupe social* (Paris: Éditions de Minuit, 1982), p. 57. English translation: *The Making of a Class: Cadres in French Society*, translated by Arthur Goldhammer (Cambridge: Cambridge University Press, 1987).

[44] AN, Marine, G 93, fol. 22, Aimar Joseph de Roquefeuil to an unidentified person, Brest, 3 December 1762. Vergé-Franceschi, *Marine et éducation* (cit. note 18), p. 233.

only be based on "blind trial and error" ("tâtonnement aveugle").[45] Likewise, the centrality of experience and manual dexterity was highlighted above all else in the common representation of surgeons. As Christelle Rabier suggested, however, it seems that the surgical profession had begun to restructure itself in the second half of the eighteenth century "around a new value, namely academic expertise, which manifested in the social order in the posts of author and professor."[46] The pugnacity of the surgeons in obtaining confirmation of the first will of their colleague Antoine Louis, in which he left his books to the Académie, over the second, in which he did not, marked the growing importance of the book, not only as an object of professional knowledge but also as a constituent element of a collective identity.

This identity dimension explains why strategies aimed at giving the library visibility in the social world were present in these two academies and not the others. Even though the academic libraries were primarily a working tool for internal use, the Académie de Marine and the Académie de Chirurgie arranged for their libraries to be open to the public. This was effective from the Paris library's inception and from 1771 onwards for the Brest library.[47] The opening was part of a real 'publicity mystique,' evidenced in 1773 in the preface to *Mémoires de l'Académie royale de Marine* and in 1783 in the note to the *Encyclopédie méthodique*, written by an academician:

> Everyone was aware how useful it would be to open the library to the public promptly in a département where so many people need help in all areas of the nautical art & related subjects, such as medicine, surgery, physics, mathematics, botany, &c. and a host of arts subjects, which all contribute to perfecting the seafaring sciences.
>
> It took a lot of effort and research to supplement this library with such a varied choice without increasing expenditure too much. This was done with zeal. Bylaws were introduced to ensure that this deposit, which was already quite considerable, was increased every day and to provide for the policing of the library once it became public. It was opened for the first time on 14 October 1771. It welcomes not only all naval personnel and those attached to the navy, who through their education are in a position to consult the books, but also all the officers from the garrison & anyone else in Brest who would be admitted to the public libraries in Paris. It has had a constant flow of users.[48]

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[45] Bigot de Morogues's inaugural speech, cited in Philippe Henwood, "L'Académie de Marine à Brest au XVIIIe siècle," in *La Mer au siècle des Encyclopédies* (cit. note 18), pp. 125-134, p. 128. See also the preface to *Mémoires de l'Académie royale de marine* (Brest: Malassis, 1773), pp. iv-v.

[46] Rabier, *Les chirurgiens* (cit. note 18), p. 293.

[47] Service Historique de la Défense, fonds de l'Académie Royale de Marine de Brest, 90, fol. 20, *Projet de règlement pour l'entrée de la bibliotèque de l'Académie*; 108, fasc. 2, *Extrait des registres de l'Académie royale de marine pour servir de règlement à la bibliothèque* (Brest, 5 October 1771). Opening became daily from 1775 onwards. The Académie de Chirurgie library was probably reserved for the surgeons and their students. A draft regulation in 1789 proposed opening it on Tuesdays and Fridays for 3-5 hours (ARC, box 11, file 27, n° 27).

[48] *Encyclopédie méthodique. Marine*, 3 vols.: Vol. I (Paris: Panckoucke, 1783), p. 12 ("Chacun sentait combien il deviendrait utile de rendre promptement la bibliothèque publique, dans un département où tant de personnes ont besoin de secours sur toutes les parties de l'art nautique, & sur ceux qui y ont rapport, comme la médecine, la chirurgie, la physique, les mathématiques, la botanique, &c. et d'une foule d'arts, qui concourent à la perfection de ceux de la marine. / Il fallait des soins, des recherches pour compléter cette bibliothèque si variée, avec choix et sans trop multiplier les dépenses; on s'y livra avec ardeur. On fit des règlemens en vertu desquels ce dépôt, déjà si considérable, augmente tous les jours; on en fit pour la police de la bibliothèque rendue publique, & elle fut ouverte, pour la première fois, le 14 octobre 1771. On y reçoit non seulement toutes les personnes de la marine ou attachées à la marine, qui, par leur éducation, sont en état de consulter des livres, mais encore tous les officiers de la garnison & toutes les autres personnes de Brest, qui seroient admises à Paris aux bibliothèques publiques; elle n'a jamais manqué d'être fréquentée").

The publication of the library catalogue in 1781 was another investment that complemented the opening to the public and consolidated the coherence of 'marine science,' which had emerged from an ensemble of multidisciplinary fields of learning. This effort to open to the public was similar to the efforts of other academies in the province, which formed an important educational resource at local level all the way from La Rochelle to Bordeaux. However, there is no doubt this one was especially necessary on account of the fact, first, that the academy in Brest, unlike the others, was shut away in a naval dockyard, second, that it formed an isolate in a town with a low level of education and, third, that it did not hold public sessions.[49]

This investment was not just a façade. The libraries played a strategic role in the two academies' missions to promote scientific knowledge in socio-professional classes that were relatively poorly equipped in terms of book resources (naval officers in Brest, students at the surgical schools in Paris). They also give an account of the long-term evolutions in the material and intellectual uses of the book in professions working 'on the ground,' which, at the same time, evidence other forms of working libraries. Let's take for example the naval surgical schools. Three schools for naval surgeons were established in France at the beginning of the 18th century, located in Rochefort (1722), Toulon (1725) and Brest (1731).[50] In these towns, which had all either been founded or reorganised around their arsenals, the circulation of the written and printed word responded above all to the demands of the maritime and military administrations. The very small number of educated elite, the rapid turnover of administrators and the mass illiteracy of the working-class populations discouraged book production and the creation of libraries.[51] In the schools for naval surgeons, the social and intellectual recruitment of students who were, as the Rochefort school's founder, Jean Cochon-Dupuy, observed, "little used to reading" ("peu accoutumés à la lecture") did not make the installation of libraries a useful strategy.[52] The schools' professors, including Cochon-Dupuy in Rochefort and Étienne Chardon de Courcelles in Brest, preferred to write short manuals, which the students appropriated by reading them or copying them out.[53] The general regulation for these schools, promulgated on 1 March 1768, still did not make any provisions for a library. In Rochefort, the hydrography school library only held a few volumes prior to the Revolution. The effects of the progressive theorisation of naval construction were only felt later here. The hydrography school and the Hôpital de la Marine libraries were set up in 1798 using books seized during the Revolutionary confiscations from the nobility and the naval officers who had opposed the Revolution.

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[49] Jean Quéniart calculated that less than 10% of the inventories made following deaths in Brest in the second half of the eighteenth century made any mention of books (*Culture et société urbaines dans la France de l'Ouest au XVIIIe siècle* [PhD Diss., Université Lille-III, 1977], II, pp. 562, 948).

[50] On these schools, see Jean-Luc Suberchicot, *Le service de santé de la marine royale, 1661-1793* (PhD Diss., Université Paris-IV, 1998), and Michel Sardet, *Un modèle sous l'Ancien régime: l'École de chirurgie du port de Rochefort (1722-1789)* (Vincennes: Service Historique de la Marine, 2000).

[51] Olivier Desgranges, *Le livre et l'écrit dans les villes-arsenal de la Marine française (XVIIe-XIXe siècles): l'exemple de Rochefort* (PhD Diss., École Nationale des Chartes, 2018).

[52] AN, Marine, G 90, fol. 21, s.d.

[53] Jean Cochon-Dupuy, *Manuel des opérations de chirurgie extrait des meilleurs livres pour servir à l'instruction des élèves chirurgiens de la marine* (Toulon: Mallard, 1726); Étienne Chardon de Courcelles, *Manuel des opérations les plus ordinaires de la chirurgie* (Brest: Malassis, 1756). See also Yannick Romieux, "Les livres médico-pharmaceutiques dans le service de santé navale," in *Le livre maritime* (cit. note 18), pp. 163-171.

However, some small collections of books were assembled in the second half of the eighteenth century in Rochefort and Toulon. In Rochefort, the little collection of course books and medical books at the naval school was supplemented by part of the library belonging to the assistant physician, Gérard-Marie Cuvelier.[54] In Toulon, the naval surgeons themselves founded a mutualistic library. According to the intendant, Hurson, "the books reserved for this library, the costs of which will be deducted from each surgeon's salary, will be sufficient for its formation and upkeep, bearing in mind it should only be composed of medical and surgical books that will be useful for their learning and that any that might serve to only satisfy curiosity should be removed" ("les fonds qui y sont destinés et dont la retenue sera faite à mesure à chaque chirurgien sur ses apointemens, pourront suffire pour la formation et l'entretien de cette bibliothèque, en ayant attention de ne la composer que de livres de médecine et de chirurgie utiles pour leur instruction, et de retrancher tous ceux qui ne pourroient servir qu'à satisfaire la curiosité").[55] At a higher social and professional level, the *guardie marine* school in Livorno, founded in 1766, shared this concern for practical utility. A small library specialising in mathematics, history, architecture and military and naval engineering was set up in 1772 using an ensemble of books donated by the officers plus a sum of 10 *zecchini* (approximately 130 French *livres*) from each of the *guardie marine*. Between 1772 and 1777, 50 *lire* a month was saved on subsistence costs and assigned to book purchases. This "reciprocal union" ("reciproca unione") allowed everyone to benefit from books that were useful to their profession, "particularly the pilots and more junior officers, who enjoyed less preferential treatment" ("e molto più ai piloti, e altri bassi uffizali, che hanno meno assegnamenti") and who would not have been able to buy these books themselves.[56] As Secretary of State Francesco Seratti noted,

> The utility of the Livorno Marine Library is clear because, on the one hand, it is made up almost entirely of professional books and, on the other, there is a regulation that allows the officers, *guardie marine* and junior officers to not only come and work in the library but also to borrow, for a limited time, the books they need for their work and for acquiring the necessary knowledge.[57]

This evolution could also be found in other teaching establishments, where practical knowledge was subject to theoretical formalisation throughout the 18th century. The library in the Alfort veterinary school near Paris provides a good example of this. Founded in 1765, the

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[54] Marie-Pierre Demarcq, "La bibliothèque de l'École de médecine navale," *Neptunia*, 1994, *196*:47-49.

[55] AN, Marine, B^3 579, fol. 80, Hurson to Choiseul, 2 August 1768 and C^2 18 II, fol. 99, Choiseul to Hurson, 23 July 1768. He stated that the subscriptions would be reduced by half after three years and that the subscribers would be able to recover their costs. According to a 1767 inventory, there were around 40 surgeons involved (AN, Marine, G 90, fol. 86-87).

[56] ASF, Scrittoio delle fortezze e fabbriche, 207, memorandum n.d.

[57] ASF, Segreteria di Stato, 275, protocol 53 n° 21 (undated, but post-3 December 1779) ("l'utilità della Libreria della Marina in Livorno apparisce chiaramente, primo dall'essere questa formata di quasi tutti Libri di mestiere, e secondo dall'esistere un'Ordine, che non solo tutti gli Uffiziali, Guardie Marine, e Bassi Uffiziali possino venire a studiare in detta Libreria, ma dall'essere anco loro permesso di potere per un determinato tempo ritenere presso di loro quei Libri, che possono abbisognarli per studiare, acquistare le necessarie cognizioni"). This library stirred up envy in some quarters. After the transfer of the *guardie marine* to Pisa, the prior of the Order of the Knights of Santo Stefano managed to persuade the grand duke to transport the books to Pisa, but a collective petition from the naval officers to the governor of Livorno led to this decision being quashed (*ibid.* and ASF, Segreteria di Stato, 273, protocol 48 n° 27). A year later, the warden was asked to pass on a number of books to the Museum of Physics, but the museum's archives do not show if this transfer ever took place.

school prioritised an intake of farriers' sons aged sixteen and over who were only required to have minimal skills in reading and writing. The small library, which was assembled in a cabinet next to the dissection room, was probably targeted at the establishment's teaching staff rather than its students.[58] As in the schools for surgeons in the ports, the professors would write the course manuscripts and then have the students copy them out. The students' expenses claims show they also had to buy the books they needed for their studies. In 1787, the school's director, Chabert, highlighted the need for a library in the establishment. A few months later, however, after the school was refounded by the revolutionary authorities in April 1795, it was the students who demanded the creation of a complete collection of works relating to the rural economy and veterinary science "in order that student is able to take notes and obtain all the information they need for their education" ("afin que chaque élève puisse y prendre les notes et renseignements utiles à son instruction").[59]

Professional tools

A reflection on the limitations of the corpus of 'useful' knowledge and on the public entitlement to access it dominated the whole constitution of these working tools. In this sense, the library can be described as an indicator of the processes of professionalisation within the scientific communities, which were forging a common identity around shared intellectual references and professional instruments that were inaccessible to the layperson. To reflect more specifically on this last point, we can draw on two Florentine collections, those of the Santa Maria Nuova Hospital and the Royal Museum of Physics and Natural History, opened in 1775. These two institutions played a central role in Grand Duke Peter Leopold's science policy. For the travellers coming from all over Europe, this was evidence of the way in which the sovereign, with the help of the scholars' skills, was able to change the life circumstances of the vast majority.[60]

The libraries in these two institutions allow us, first of all, to follow the supposedly 'scientific' process of selection and demarcation, since they were both formed from choices made from a pre-existing collection. The Museum of Physics Library was formed in 1771 from a selection of books from the Palatine Library, which the grand duke had decided to remove from the Pitti Palace. The holdings at the Santa Maria Nuova Hospital library came about as a result of a radical purge in 1778 of the books that had been assembled by the institution since the seventeenth century, which led to only a sixth of the books being retained.

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[58] Described as "approximately twenty books honoured with the name of library" ("vingtaine de bouquins qu'on honore du nom de bibliothèque") in a revolutionary pamphlet (1789), the collection at the time probably comprised around a hundred books (Alcide Louis Joseph Railliet, Léon Théophile Moulé, *Histoire de l'école d'Alfort* [Paris: Asselin et Houzeau, 1908], pp. 81, 257, 395).

[59] AN F17 1214B, d. 13, letter from the Alfort veterinary school students to the Comité d'Instruction Publique (public education committee), 27 Vendémiaire Year IV (19 October 1795). See also Robin, *Au purgatoire des utilités* (cit. note 5), p. 627.

[60] Renato Pasta, *Scienza, Politica e Rivoluzione. L'opera di Giovanni Fabbroni (1752-1822) intellettuale e funzionario al servizio dei Lorena* (Firenze: Olschki, 1989); Simone Contardi, *La Casa di Salomone a Firenze. L'Imperiale e Reale Museo di Fisica e Storia Naturale (1755-1801)* (Firenze: Olschki, 2002); Id., "The Origins of a Scientific Institution: Felice Fontana and the Birth of the Real Museo di Fisica e Storia Naturale di Firenze," *Nuncius*, 2006, *21*:251-263; Anna Maerker, *Model Experts: Wax Anatomies and Enlightenment in Florence and Vienna, 1775-1815* (Manchester: Manchester University Press, 2011). On the libraries in these institutions, see Emmanuelle Chapron, *Ad utilità pubblica. Politique des bibliothèques et pratiques du livre à Florence au XVIIIe siècle* (Geneva: Droz, 2009).

This drastic sorting marked the final stage of a long process. The redefining of the hospital library contents accompanied the reforms in the establishment throughout the eighteenth century. The first stage began in 1740 when a commission of doctors was tasked with putting forward proposals to improve the care and teaching at the hospital. To turn the library into a real working tool for the students and professors, Doctor Antonio Cocchi suggested "excluding the least useful books" ("l'esclusione dei [libri] più inutili") and classifying the others into four sectors (grammar- and logic-related disciplines, scientific subjects, medical sciences, law and history), each comprising five classes (Fig. 4, column a).[61] This was not the classification ultimately implemented, however, which was instead that of Cocchi's student Giovanni Targioni Tozzetti, who was tasked with drawing up the library's catalogue a few years later. The rules set by Targioni Tozzetti were "to group all the books that may be suitable for a hospital library in the first twelve classes and to put all the remaining books into the other seven classes so that if we decide to use it, it will be easy to separate the useful from the superfluous books" ("di riunire nelle prime dodici Classi tutti libri che potevano convenire ad una libreria di spedale, e nelle sette posteriori tutti quelli che erano per essa superflui, acciò qualora fosse piaciuto farne uso, riescisse facile la separazione degli utili dai superflui").[62] To reduce the library to only those books that were relevant to hospital use, they just had to truncate these latter classes. The utility criterion had already evolved. Whereas Cocchi had placed the sciences of language at the top as being foundational to all intellectual learning, Targioni Tozzetti placed them at the transition point between useful and superfluous (Fig. 4, column b). The notion of useful knowledge had eliminated the literary and historical elements that were still closely associated with scientific knowledge, not just in Tuscan culture but in the suggested reading programmes given to doctors at the time.[63]

Fig. 4. Defining knowledge: the classifications of the Santa Maria Nuova Hospital library in Florence.

a. Antonio Cocchi's classification (1742) [reconstitution from classification of the Massetani legacy]	b. Giovanni Targioni Tozzetti's classification (1746-1753)
I. Lexicons, dictionaries	I. Logic
II. Logic, metaphysics	II. Geometry
III. Literature	III. Cosmography
IV. Poets	IV. Physics
V. Reviews and miscellanies	V. Anatomy
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VI. Mathematics	VII. Practical medicine
VII. Physics	VIII. Surgery
VIII. Geography	IX. Pharmacy, chemistry
IX. Botany	X. Natural history
X. Natural history	XI. Miscellaneous arts

[61] Antonio Cocchi, *Relazione dello Spedale di Santa Maria Nuova di Firenze*, edited by Maria Mannelli Goggioli (Firenze: Le Lettere, 2000), p. 135.
[62] ASF, Buon governo, 512, ins. 9: L.G. Targioni to the medical deputation, 18 November 1778, reporting Giovanni Targioni Tozzetti's intentions.
[63] Professor Carlo Giannella's *De legendorum librorum medicorum instituenda ratione* (Padova: D. Occhi, 1746) included, alongside professional instruction, reading of a "moral, poetic and historical" nature.

---------- XI. Anatomy XII. Medicine XIII. Surgery XIV. XV. Pharmacy ---------- XVI. XVII. Civil law XVIII. Canon law XIX. History XX.	XII. Miscellanies ---------- XIII. History XIV. Erudition XV. Law XVI. Theology XVII. Ecclesiastical history XVIII. Patristics XIX. Hebrew texts XX. Manuscripts

However, it was another thirty years before this "salutary purge" was implemented within the framework of the great hospital reform that had been introduced by Grand Duke Peter Leopold at the end of the 1770s, which led to a rethink of the material place and functions of the library within the establishment. The task of sorting was entrusted to the secretary of the reform commission, Doctor Giovanni Luigi Targioni, who retained the partitioning method proposed by Targioni Tozzetti. He selected the books in the first twelve classes and added some more from the next seven classes. These included works of literature to support the students' Latin, books on "l'arte di bene scrivere italiano o latino" so that the professors "sappino bene scrivere le storie delle malattie" and some legal books for criminology reports.[64] In practice, however, the definitive partitioning between 'useful' and 'non-useful' books during the sorting process was a lot stricter. The library was not only truncated from these seven latter classes but also from the first three, even though they were judged to be 'useful' by the two doctors. This obsession with narrowing the contents solely around 'useful knowledge' was also in evidence at the Royal Museum of Physics and Natural History.[65] The choice of books from the Palatine Library had already been relatively specialised, but it seems the successive directors all reiterated the need to rid the library of any books that may have slipped in inadvertently or "per puro lusso," "not leaving any books other than those on physics, chemistry, natural history and other related sciences" ("non dovendovi rimanere altri libri che quelli che trattano di fisica, chimica, storia naturale e scienze spettanti alla medesima").[66]

In both establishments, the process of demarcating different areas of knowledge was also accompanied by a reflection on their circle of users. This was particularly noticeable at the Museum of Physics, where the library's status remained undecided for a long time. In 1783, Grand Duke Peter Leopold, who saw the museum as a tool for modernising the scientific education of the Tuscan elites, ordered the director, Felice Fontana, to organise botany and chemistry lectures for the public and to open the library to all. This decision, which was part of a broader reorganisation of the network of Florentine libraries, reflected the concerns of some of the *Georgofili* academy members about the diffusion of the agronomic, chemical and

[64] *Ibid*.
[65] On the concept of "useful knowledge," see also Barsanti, Becagli, Pasta (eds.), *La politica della scienza* (cit. note 1).
[66] ASF, Segreteria di finanze, 1137: R. Cocchi to A. Tavanti, 20 January 1774, on the subject of the *Histoire de l'Académie des Inscriptions et Belles Lettres de Paris* and ASF, Scrittoio delle fortezze e fabbriche, 207.

technical knowledge being developed by the academies and scholars to larger sections of the population. "We are so convinced of the utility of public libraries in terms of increasing the population's knowledge […] that instead of just having them in cities, we would also like to have one in every town and village, specializing in commerce, agriculture or crafts depending on the area's particular needs" wrote the *Georgofilo* Marco Lastri.[67] Successive directors put up a passive resistance to these plans, arguing that the library was above all a working tool for the museum staff and that the books had to remain available and in good condition. The museum's archives show how the library was used on a daily basis for the development and staging of collections. The meticulously updated medicine collection was used for producing the anatomical wax models that had made the museum famous. Other books were used to organise and label the exhibited collections. In 1794, Fabbroni requested the purchase of Bloch's *Histoire naturelle générale et particulière des poissons*, "would be very useful in the distribution and denomination of the individuals that make up the tethyological class in this royal museum" ("che riuscirebbe di molta utilità nella distribuzione, e denominazione degli individui costituenti la classe tetiologica di questo Real Museo").[68] Behind the material arguments, the concern underpinning their refusal to open to the public was that a separation should be maintained between a small group of readers authorised to access the books and a wider public, whose education had to be confined to the autodidactic layout of the museum's artefacts. In this sense, one of the directors' regular proposals was to move the library from its current location at the centre of the physics rooms to a gap in the normal visitor route.

While they rejected an official and expanded opening, the museum's directors nevertheless arranged for a public space to be made available with limited access. They never declined the opportunity to grant an in-situ consultation to "a studious, scholarly or known person who requested one" ("a qualche persona studiosa, o dotta, e conosciuta, che lo domandasse").[69] In the absence of any official regulation, the museum library's operations aligned themselves with the regime of collusion that was observable in the erudite, aristocratic collections and participated in the formation of a local community of scientific readers, land administrators, engineers, academicians and university professors, who sometimes obtained permission to borrow books using public utility as their argument. Hence, a forestry administrator in the province of Siena borrowed Duhamel du Monceau's *Traité des arbres et arbustes* "to use it to find woods in Maremma" ("per farne uso in occasione di dover trovar dei legnami in Maremma"), the royal mathematician Pietro Ferroni took out Brussels Academy's annals "to confront certain theories relating to the curve of bridge arches" ("riscontrare alcune teorie relative alla curva degl'archi dei ponti") and a chemistry professor from the University of Pisa borrowed books that he intended to use to reorganise his own shell collection as well as that in the university's exhibition room.[70]

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[67] *Novelle letterarie pubblicate in Firenze*, XVIII, 25, 22 June 1787, 388-389, on the publication of the address *Nel solenne aprimento della pubblica Biblioteca dell'Università di Macerata* (Macerata: presso Antonio Cortesi e Bartolomeo Capitani, 1787) ("Siamo tanto persuasi che le pubbliche Biblioteche siano utili alla maggior cultura delle popolazioni […] che invece di desiderar che le Città sole ne abbiano, vorremmo che ogni Terra o Borgo possedesse la sua, di commercio, di agricoltura, di arti, socondo che il bisogno e l'occorrenza del luogo richiede").
[68] IMSS, Affari 1794, fol. 331-332: G. Fabbroni to L. Bartolini, 26 November 1794.
[69] ASF, Fabbroni, 13, ins. 159.
[70] IMSS, Affari 1792, fol. 173-174, 176; IMSS, Affari 1797, fol. 4-9.

This temptation to have a closed library also reared its head at the Santa Maria Nuova Hospital. It was all the more obvious here because this hospital library had a long tradition of opening to the public dating back to its foundation in 1679. To our knowledge, it was even the first Florentine library to have its opening to the public framed in regulation, in contrast to the ecclesiastical institutions, which practised a much more informal opening policy. The 1679 bylaw clearly sets out three categories of readers: the people at the hospital, that is, the students, doctors and surgeons, whom the holdings were principally aimed at; the Florentines who came to work there; and the foreigners who came to work in or simply to visit the library.[71] This public character soon gave rise to many bequests, including those of the patrician Lorenzo Pucci in 1679 (who gave all his books "per aggregarsi alla publica libreria, che intende ereggere il detto spedale"), the Florentine bookseller Giovan Filippo Cecchi in 1687 (who gave books "per servizio della Nuova Libreria eretta di nuovo per il publico benefizio") and Vincenzo Viviani, Galileo's most devoted disciple, in 1689.[72] In Viviani's case, the very public nature of the hospital library led him to exclude from his testamentary dispositions all the Galileo manuscripts he had taken great care to collect for fear that they might be jeopardised.[73]

The hospital reform of the 1770s led to a rethink of the library's uses when five-sixths of its historical collection was withdrawn. Under the new regulation of 1783, the library seems to have become closely linked to the pedagogical activities at the hospital. Opening hours were redefined in line with lesson times, and the management of the library was given over to the superintendent of studies. Encouraging the librarian to organise medical, chemistry and surgical exercises that might "rendere più fruttuosa la lettura dei libri," the regulation drafters even made suggestions for the modalities of 'good scientific reading,' together with observation and experimentation.[74] The 1783 regulation stipulated that students and professors were the library's prioritised and preferential users but that it could also admit "qualunque estraneo ancora, previa l'annuenza del Presidente agli Studi," In other words, its setup was probably very similar to that of the museum.[75]

The history of scientific libraries allows us to take a different approach to the question of the professionalisation of scientific activities in the eighteenth century, which is generally tackled from the perspective of educational and recruitment institutions. If we retain the neo-Weberian schema, which represents professionalisation as the outcome of a collective strategy of a group aiming to establish an intellectual and social monopoly over an activity, then libraries showed the capacity of institutional actors to define a body of shared references and construct an image of the professional scholar whose training and practice premises were closed to dilettantes. In reality, the evolution was less linear and was always marked by

[71] ASF, Ospedale di Santa Maria Nuova, 587, p. 201-203.
[72] ASF, Notarile moderno, protocol 16759, notary Noferi Calici, fol. 98; ASF, Ospedale, 53, fol. 262; ASF, Notarile moderno, protocol 3388, notary Simone Mugnai, fol. 64v.
[73] Massimo Bucciantini, "Celebration and Conservation: The Galilean Collection of the National Library of Florence," in *Archives of the Scientific Revolution* (cit. note 8), pp. 21-34: 28.
[74] ASF, Ospedale di Santa Maria Nuova, 1309, Affari, I, 1782, affare 20, *Regolamento per la Libreria del Regio Spedale di Santa Maria Nuova approvato con Lettera della R. Segreteria di Stato del di 27 Dicembre 1780.* On the "Italian scientific readers," see also Patrizia Delpiano, "Lire les sciences dans l'Italie du XVIIIe siècle," *Archives internationales d'histoire des sciences*, 2013, *63*:287-300.
[75] *Regolamento del Regio Arcispedale di Santa Maria Nuova di Firenze* (Firenze: Cambiagi, 1783).

financial, individual and institutional compromises that offered new possibilities, such as the opportunity for a body to establish its public image on the back of opening its library to the public.