Scholars at the Royal Academy of Sciences in Paris (1666-1793)

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This note summarizes our research into the scholars of the Royal Academy of Sciences of Paris from its early meetings to its dissolution.

1 SOURCES

Obtaining a complete list of the scholars who were members of the Royal Academy of Sciences of Paris was challenging, due to the numerous membership statutes. The academy's website (Sciences 2023) categorizes members as "membres" or "correspondants." This list includes individuals who were elected to institutions that revived the Royal Academy after the French Revolution.

To supplement this information, we consulted Rozier's work from 1776, which provides more detail on membership but unfortunately only goes up to 1774 (Rozier 1776). Rozier's work distinguishes several membership types: "Membres honoraires," which we consider as such; "Membres pensionnaires," whom we consider to be ordinary members; "Membres libres," whom we consider to have a weaker link with the academy than ordinary members; "Membres associés," whom we also consider to be ordinary members, and "Membres associés etrangers," whom we classify as corresponding members, hence with a weak link. In addition, there are categories labeled "adjoints," whom we consider as ordinary members, and "élèves" (students), whom we do not consider.

Finally, Maury's survey from 1864 provides a third comprehensive source, with a name index that includes a list of members of the academy (Maury 1864).

2 THE ACADEMY

Preceded by the "Marsenne" Academy of 1635 (De la Croix and Duchêne 2021), the Royal Academy of Sciences in Paris was founded in 1666 by Colbert, a minister of King Louis XIV, to advance scientific knowledge and promote the practical application of scientific research. It quickly became one of the most important scientific institutions in Europe, attracting some of the greatest scientific minds of the time. The Academy played a significant role in the development of many fields of science, including mathematics, physics, astronomy, and biology. However, the close dependency with the Crown in terms of reputation and financial resources also directed academicians' research, building a strong link between the scientific endeavours and the state. Although the Academy was small and informal, with no more than 35 members over the period 1666-1699, it was officially recognised by King Louis XIV in 1699. The Academy grew in status over time, embodying and fostering the practical and experimental way of thinking typical of the Scientific Revolution (Applebaum 2003). The structure of many eighteenth century academies followed the example of the Royal Academy of Sciences. A manuscript by the secretary of the Royal Academy of Sciences in Paris Grandjean de Fouchy (1707 – 1788) gives a taste of the Academy's outreach (McClellan 1985), which went from the French provincial academies to the Italian societies in Bologna (Rolla and Zanardello 2022), Naples and Florence, from the Imperial Academy of Saint Petersburg (De la Croix and Doraghi 2021) to the Royal Academy of Berlin (De la Croix, Eisfeld, and Ganterer 2021).

Despite its scientific importance, the Royal Academy of Sciences was dissolved during the French Revolution and was re-established as a section of the bigger Institut de France in 1795. The name "Academy of Sciences" reappeared in 1816, with the Bourbon Restoration. The French Academy of Sciences continues to operate today.
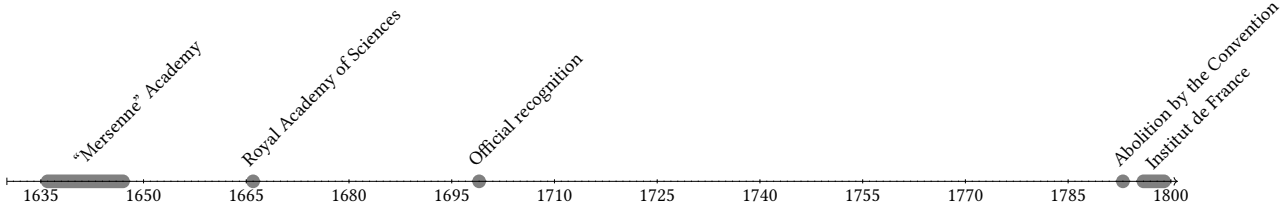

Figure 1: Timeline of the Royal Academy of Sciences of Paris

3   Descriptive statistics

Table 1 displays some descriptive statistics. Overall, we link 465 scholars to the Royal Academy of Sciences in Paris. We observe the year and place of birth for almost all of them. The average age at first appointment was around 44 years, which is very late compared to other academies. Longevity is 69.6 years. The median distance between places of birth and activity is high, at 263km, reflecting to the great influence and outreach of the Royal Academy of Sciences (see also Figures 3 and 4). The coverage of scholars is high for both Wikipedia and Worldcat; by finding more than 90% of the members in both catalogues we confirm the outstanding position of the Royal Academy of Sciences in Paris.

Period	nb. obs	birth known date	place	mean age at appoint.	mean age at death	med. dist. birth-univ.	with Wiki.	with Worldcat
1618−1685	35	85.7%	82.9%	45.6	71.1	150	97.1%	91.4%
1686−1733	169	88.2%	85.8%	44.7	69	344	86.4%	82.8%
1734−1800	261	97.7%	97.7%	44.1	69.8	264	93.5%	95.4%
1618−1800	465	93.3%	92.3%	44.4	69.6	263	91.2%	90.5%

Table 1: Summary statistics by period

4   Fields

Figure 2 shows the balance between the different fields featured at the Royal Academy of Sciences. As one of the first official scientific academies created in Europe between the 1650s and 1800, the Royal Academy of Science is dominated by scientific fields: *sciences* includes mathematics, physics, biology, geography and botany, and *medicine* plays a significant role, together with *applied science* (i.e., engineering, agronomy, and architecture). The humanities have a marginal role, even though we can count a total of 42 members studying these topics. The honorary members (31 in total) are mainly influential personalities in the political and religious sphere.

5   Place of birth

Figure 3 displays the documented birthplaces of the ordinary members active at the Royal Academy of Sciences. Figure 4 shows the birthplaces of the corresponding scholars and literati, together with the "Membres libres," and foreign members from Europe and beyond, who had some indirect contacts with the Academy (see Section 9).
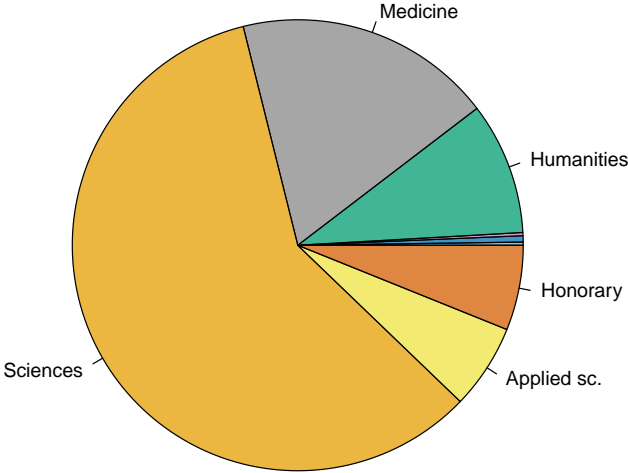
Figure 2: Broad fields at the Royal Academy of Sciences (published scholars only)
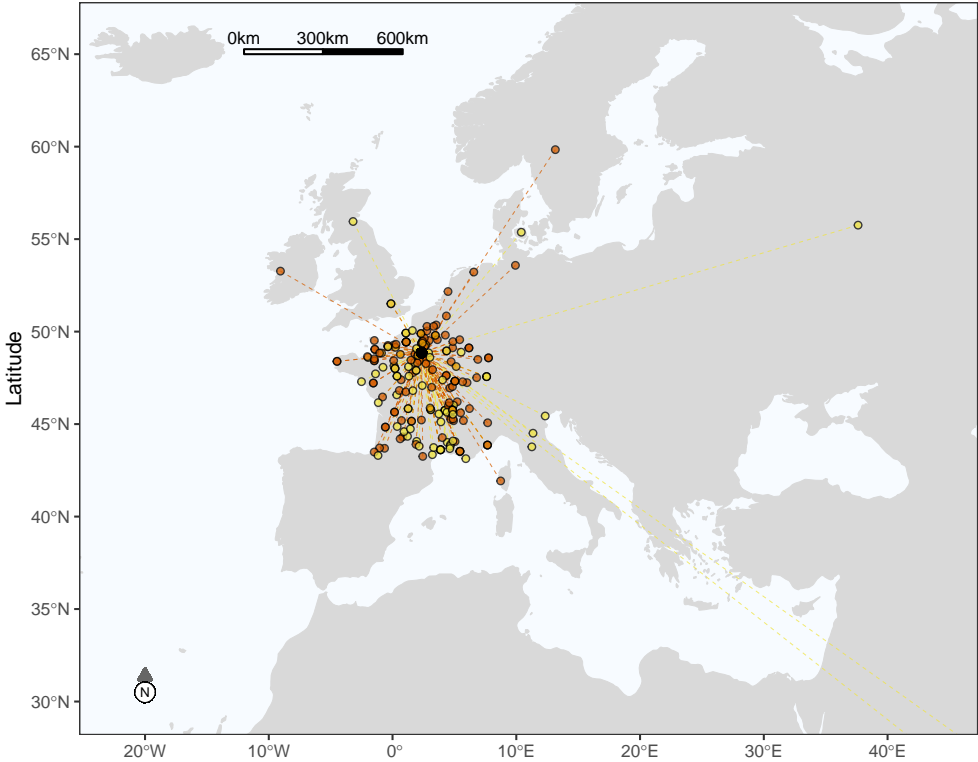

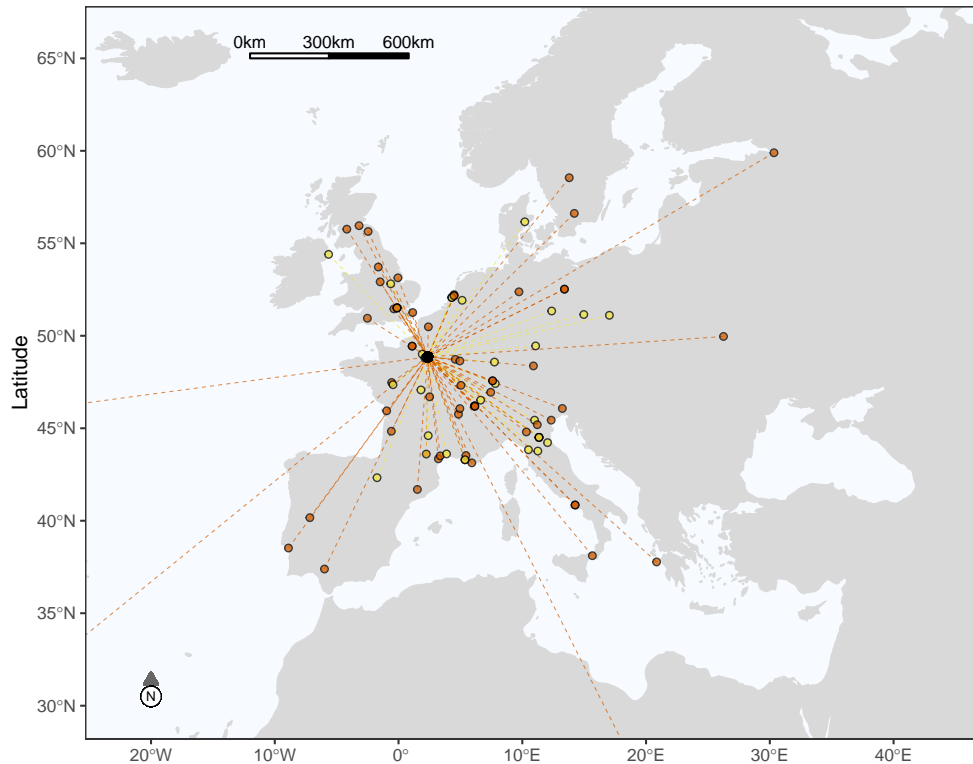Figure 3: Places of birth of the ordinary members of the Royal Academy of Sciences

Figure 4: Places of birth of the corresponding members of the Royal Academy of Sciences

6   Human capital of scholars and literati

For each person in the database, we compute a heuristic human capital index, identified by combining information from Worldcat and Wikipedia using principal component analysis. Figure 5 shows the names of all the scholars with a positive human capital index at the Royal Academy of Sciences.

7   Top 7 scholars

Georges-Louis Leclerc Buffon   (Montbard 1707 – Paris 1788) was a renowned naturalist, mathematician, cosmologist, and encyclopedist. Initially, Buffon was interested in mathematics, and made significant contributions to that field. However, in 1739 he was appointed director of the King's Botanic Garden in Paris and thereafter Buffon devoted himself to natural history. He worked at the Royal Academy of Sciences in Paris for a remarkable 55 years from 1733 to his death. In that time he published his most important work on similarities between humans and apes, and he corresponded with the mathematician Gabriel Cramer. In addition to his work at the Royal Academy of Sciences, Buffon was also affiliated with the Académie Française in 1753. He was a member of the Royal Society from 1740.

Jean le Rond D'Alembert   (Paris 1717 – Paris 1783) was a French mathematician and philosopher, who worked at the Royal Academy of Sciences in Paris for over four decades, from 1741 to 1783. D'Alembert was first admitted to the academy in 1741 at the age of 24, thanks to his notable studies on integral calculus. He also became a member of the Berlin Academy three years later, but he preferred a quieter academic life and refused offers to become its President. In the 1740s, D'Alembert was also a co-editor of Diderot for the famous *Encyclopédie*. D'Alembert's affiliation with the Royal Academy of Sciences culminated in his appointment as Permanent Secretary in 1772. D'Alembert was also member at the Académie Française from 1754 and at the Royal Society from 1748.

Jean-Baptiste de Lamarck   (Bazentin 1744 – Paris 1829) was a French naturalist and biologist. One

century before Darwin, Lamarck was one of the pioneers in proposing a theory of evolution, emphasizing the role of natural laws and principles of erosion in shaping the evolution of species. He became member of the Royal Academy of Sciences in 1783, and he remained affiliated until his death. He was also appointed to the Chair of Botany at the Jardin des Plantes in 1788.

Nicolas Malebranche (Paris 1638 – Paris 1715) was a French theologian, Catholic priest, philosopher and scientist. He was member of the Royal Academy of Sciences in 1699, when he addresses the academicians on the origins of colors. He remained a member until his death. Malebranche was best known for his philosophical and theological writings, in which he argued for the existence of God and the active presence of the divine in all aspects of life.

Antoine Lavoisier (Paris 1743 – Paris 1794) was a French chemist who played a key role in the chemical revolution of the 18th century, shifting chemistry from a theoretical to an experimental discipline. He discovered and named oxygen and hydrogen, and wrote a first list of elements. He was a nobleman of the *Ancien Régime*, part of the administration of the *Ferme générale* which used violence to collect taxes and was highly unpopular. He was a member of the Royal Academy of Sciences in 1772, but he was a member of all the greatest academies of the time: the Royal Society (from 1788), Ricovrati Academy (from 1787) and the Institute of Bologna (from 1775). Despite his significant scientific contributions, Lavoisier fell victim to the Reign of Terror during the French Revolution and was executed by guillotine in 1794 (see Section 12).

Nicolas de Condorcet (Ribemont 1743 – Bourg-la-Reine 1794) was a French philosopher, mathematician, economist and politician. One of the most original features of Condorcet's thinking is the attempt to apply mathematical calculation to the social and moral sciences for governing social and political processes. He published several mathematical works on integral calculus, and on the calculus of probability. In 1769, he became a member of the Royal Academy of Sciences. He was also member at the Académie Française in 1782. For criticizing the Jacobin Constitution of 1793 he was arrested and died in prison.

Pierre-Simon Laplace (Beaumont-en-Auge 1749 — Paris 1827), known also as Marquis de Laplace (a title received in 1817), was a French mathematician, engineer, astronomer, and philosopher. He was one of the most important scientists of all time. He was nominated to the Royal Academy of Sciences in 1783 and remained a member until his death. He was also a member of the Academy of Sciences of Turin in 1766 and of the Royal Society in 1789. His work *Mécanique celeste* (1799 – 1795) was the turning point for mathematical astronomy, defining the shift from a geometric approach to one based on mathematical analysis. He was a leader in developing Bayesian interpretation in probability.

8   RELATED SCHOLARS

In addition to the ordinary members residing in France, several individuals were linked to the Royal Academy of Sciences via a foreign or corresponding membership. These scholars are included in the calculations for all figures but Figure 5. The six scholars listed here belong to this category and are at the top of the human capital distribution: **Isaac Newton** (Woolsthorpe-by-Colsterworth 1642 – London 1727), **Benjamin Franklin** (Boston 1706 – Philadelphia 1790), **Gottfried Wilhelm von Leibniz** (Leipzig 1646 – Hannover 1716), **Carl Linnaeus** (Rashult 1707 – Uppsala 1778), **Leonhard Euler** (Basel 1707 – Saint Petersburg 1783), and **Christian Huygens** (DenHaag 1629 – DenHaag 1695).
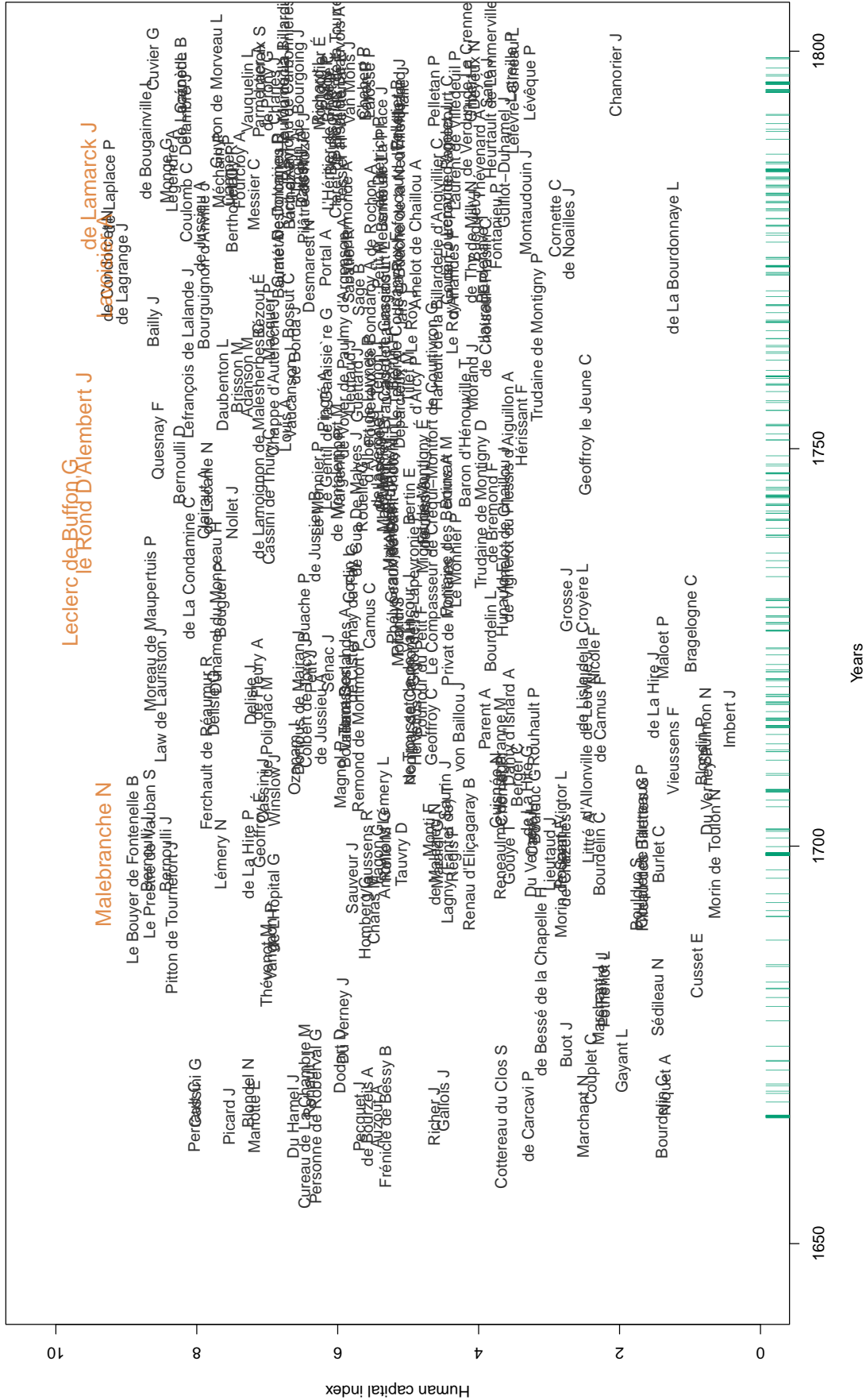
Figure 5: Famous scholars of the Royal Academy of Sciences

9   Diversity

There are no women at the Royal Academy of Sciences, even though women were members of institutions such as the Ricovrati Academy and the Institute of Bologna (Blasutto, De la Croix, and Vitale 2021; Rolla and Zanardello 2022).

Jean-Baptiste Lislet Geoffroy (Saint-Pierre 1755 — Port-Louis 1836) was a mixed-race naval officer in the corps of military engineers, in charge of cartography. He was the illegitimate son of Jean-Baptiste Geoffroy, a white engineer settled in Mauritius, and a freed black slave from Guinea (for more details De la Croix 2021a).

10   Families of scholars

We counted 22 father-son pairs among the members of the Royal Academy of Sciences. In particular, the Cassini family, of Italian origin but settled in France, has four subsequent father-son pairs who are all members of this Academy. They are famous astronomers and cartographers. To César-François (Cassini III) and Jean Dominique (Cassini IV) we owe the Cassini map, the first topographic map of the Kingdom of France. The family merged with the Vuillefroy de Silly family, through the daughter of Alexandre Henri Gabriel, Aline Françoise. Figure 6 presents their (admittedly incomplete) genealogical tree using information from geni.com and geneanet.com.
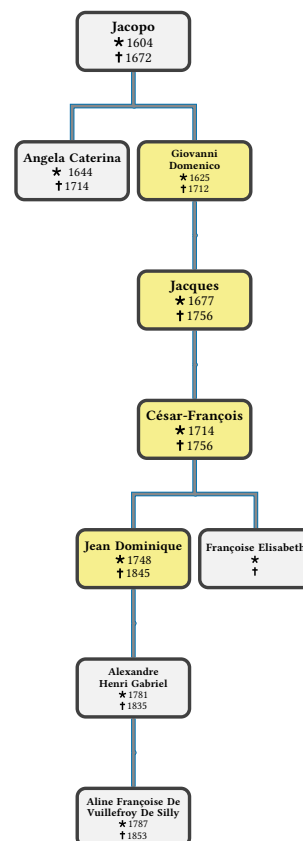

Figure 6: The Cassini family, in yellow the member of the Royal Academy of Sciences.

11   Interaction with the other Parisian Institutions

Figure 7 shows the extent of interactions between the Royal Academy of Sciences and other important institutions in Paris up to 1800. These institutions include the Académie Française (De la Croix 2022), the Royal College (De la Croix 2021b), the Royal Garden, the Académie des Inscriptions et des Belles Lettres, and the University of Paris from 1635. The interactions are based on scholars who are members of more than one institution.

The Royal Academy of Sciences and the Royal College and Gardens had the most shared members, which makes sense as both institutions focused on scientific subjects. The Académie Française and the Académie des Inscriptions et des Belles Lettres had the second largest number of shared members, likely due to their common focus on humanistic topics.

The Venn diagram – Figure 7 – also highlights the University of Paris's separation from other Parisian institutions. There were almost no shared members between the university and the other institutions, except for the Royal Academy of Sciences, which confirms the Academy's dominant position.
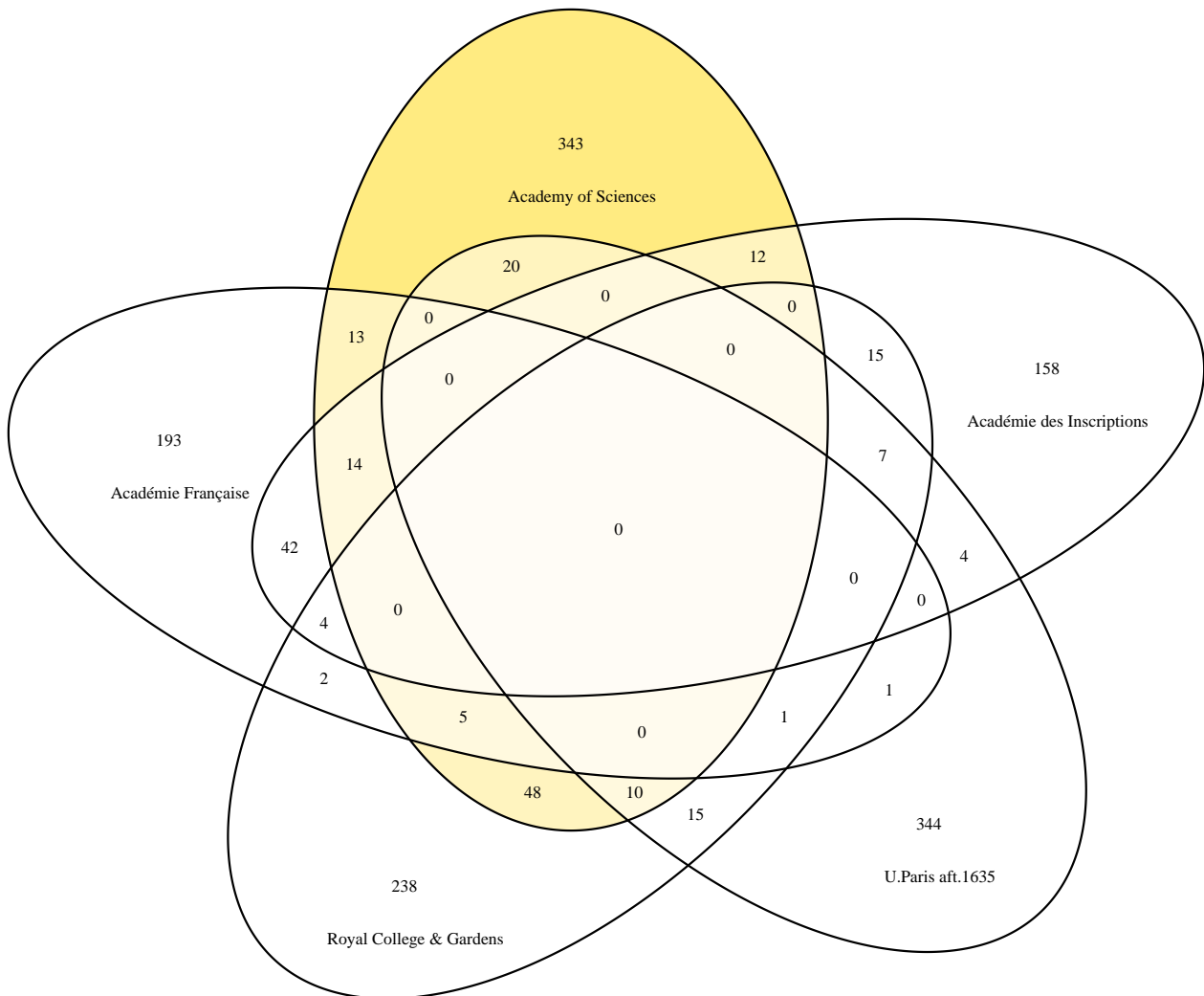

Figure 7: Interaction between the Royal Academy of Sciences, the Académie Française, the Royal College with the Royal Garden, the University of Paris from 1635, and the Académie des Inscriptions et des Belles Lettres, until 1800.

12   Victims of the Revolution

The French Revolution was probably the most deadly event for academics over the period 1000-1800. Not only was every academy and university shut down in 1793, but a large number of scholars were arrested, jailed, and sentenced to death. We list ten victims from the Royal Academy of Sciences in Paris. Among those ten, three were at the top of the distribution of human capital: Lavoisier, Condorcet, and Bailly. Here is their brief story (we indicate in parenthesis their human capital index q).

Louis-Alexandre de La Rochefoucauld was killed on 4 September 1792 by volunteer troops who were hunting aristocrats en route to fight the Prussians (aged 49, q=5.15, statesman, traveler, natural scientist).

Jean Sylvain Bailly was pressed to testify against Queen Marie Antoinette but refused. On 10 November 1793, he was brought before the Revolutionary Tribunal in Paris, speedily tried, and sentenced to death the next day (aged 57, q=8.59, astronomer, mathematician).

Philippe Friedrich Dietrich was sentenced to death by the Revolutionary Court. He was guillotined on 29 December 1793 (aged 45, q=5.42, geologist and chemist).

Jean-Baptiste-Gaspard Bochart de Saron was guillotined on 20 April 1794, during the Reign of Terror (aged 64, q=2.60, astronomer).

Nicolas de Condorcet died in prison on 29 March 1794 after a period of hiding from the French Revolutionary authorities (aged 50, q=9.27, philosopher, mathematician).

Guillaume-Chrétien de Lamoignon de Malesherbes was imprisoned with his family for "conspiracy with the emigrants". In April 1794 they were all guillotined in Paris (aged 72, q=7.10, statesman, writer).

Antoine-Laurent de Lavoisier and the other Farmers General (major tax collectors) faced accusations of defrauding the state of money owed to it. He was convicted and guillotined on 8 May 1794 along with his 27 co-defendants. Lagrange lamented the beheading, saying: "It took them only an instant to cut off this head, and one hundred years might not suffice to reproduce its like." (aged 50, q=9.31, chemist).

Étienne Charles de Loménie de Brienne, because of his past and present conduct, was an object of suspicion to the then prominent revolutionaries. He was arrested at Sens on 18 February 1794, and that same night died in prison (aged 66, bishop, statesman).

Jean-Baptiste de Machault was apprehended in 1794, after a period of hiding. He was imprisoned in Paris, where he died after a few weeks (aged 93, statesman).

Antoine-Jean Amelot de Chaillou, like many nobles, was arrested in 1792 and died in prison in 1795 (aged 62, statesman).

13   Final Thoughts

The Royal Academy of Sciences in Paris quickly became one of the most important scientific institutions in Europe. The Academy played a leading role in the development of many fields of science and in spreading the new, experiment-driven way of thinking. The Academy ended abruptly and bloodily with the Revolution and the First Republic.

Acknowledgments

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Twitter: https://twitter.com/UTHCerc
Database: https://shiny-lidam.sipr.ucl.ac.be/scholars/

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