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# Enlightening Water

Science, market & regulation of mineral  
waters in eighteenth-century France

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### **Abstract**

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My thesis investigates the process through which French mineral waters were conceptually and materially transformed by the forces of market, regulation, and science during the Enlightenment. Tracing this process deepens current understandings of eighteenth-century societies, and presents a novel image of the development of medicine and chemistry.

Eighteenth-century mineral waters were no longer confined to discrete spa towns. Instead, their use had become a kingdom-wide phenomenon, thanks to developments in bottling. Increased access to mineral waters caught the interest of medical and chemical practitioners who wanted to explain the striking properties of the waters and ensure they were sold fairly and safely. This culminated in the 1776 creation of a dedicated regulatory institution, the Société de Médecine, which attempted to legislate the market of mineral waters.

By examining the extensive records of the *Société*, my work brings into focus the unsuspected reach of the mineral water market, and explores the history of the institutions that attempted to control it. In parallel, I highlight the active resistance to the centralising force of the state coming from the vast, eclectic and inherently decentred world of mineral water handlers. Mineral water knowledge, likewise, was created within a decentred network of analysts, who nevertheless produced an increasingly standardised method for the chemical examination of mineral waters. Access to this intricate process of knowledge creation is provided by hundreds of treatises, reports, and letters concerning the analysis of mineral waters produced and circulated throughout the French kingdom. This substantial array of hitherto understudied primary material, interpreted via a combination of quantitative methods and social history from below, makes a case for mineral waters as a lens to both illustrate and challenge established narratives of the period. My work thus demonstrates the significance of the Enlightenment period in the longer history of spas and healing waters.

*Keywords:* Mineral waters, Eighteenth century, French Enlightenment, History of science, History of chemistry, Social history, Société de Médecine

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*À mes parents*



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# English translations of selected terms

Société Royale de Médecine  
(SRM, or *Société*)

Royal Society of Medicine

Archives de la Société Royale  
de Médecine (ASRM)

Archives of the Royal Society  
of Medicine

Commission Royale de Méde-  
cine (*Commission*)

Royal Commission of Medicine

Archives Nationales (AN)

French National Archives

Archives de l'Académie des  
Sciences, Belles Lettres, et Arts  
de Lyon (AAL)

Archives of the Academy of  
Sciences, Fine Writing, and  
Arts of Lyon

Bibliothèque Interuniversitaire  
de Paris, pôle Pharmacie (BIU)

Inter-university library of Paris,  
Pharmacy section

Archives Municipales de la  
ville de Vichy (AMV)

Municipal Archives of the town  
of Vichy

Archives Municipales de Lyon  
(AML)

Municipal Archives of Lyon



# Chapter 1. Introducing mineral waters

The eighteenth century saw a surge of interest in mineral waters. In the sciences, many applied their talents to elucidate this bewildering natural remedy, offering various explanations for its striking medicinal properties. In 1775, Pierre-Joseph Buc'hoz, a well-known naturalist, published his *Dictionary of mineral waters*. Much to his surprise, upon publication, he had no choice but to add a note stating: “Since this Book has gone to press, we have received so many Memoirs & Dissertations on the Mineral Waters of France, that we are forced to publish a Supplement which will be even much more considerable than the Book”.<sup>1</sup> Considering the dictionary’s first volume reached an already lengthy 635 pages, his statement indicates just how much attention mineral waters had received by the later decades of the century.

Where did this outpouring of research come from, and why did French scientists decide that mineral water was a subject worth lining their bookshelves with? The most immediate reason was that mineral waters had become popular among a public who trusted them to perform a variety of cures. This medical aspect was fundamental, yet perplexing. Diderot’s *Encyclopédie* defined mineral waters as “waters charged or impregnated with mineral principles in large enough a quantity, to produce on the human body effects that are sensible & differing from those of common water.”<sup>2</sup> This simple definition concealed a world of complexity. While most agreed that mineral waters were naturally occurring springs with effects on the human body, understanding the composition of a mineral water, and how these components might relate to their therapeutic properties, turned out to be a difficult endeavour. Physicians and

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<sup>1</sup> Pierre-Joseph Buc'hoz, “Dictionnaire des eaux minérales: contenant leur histoire naturelle, des observations générales et des notices particulières sur différentes fontaines : une bibliographie hydrologique, etc.” (A Paris, Rue Saint-Jean-de-Beauvais, la premiere cochere au-dessus du College, 1775), 635. “Depuis que cet Ouvrage a été mis sous presse, il nous est parvenu tant de Mémoires & de Dissertations sur les Eaux Minérales de la France, que nous sommes obligés de publier un Supplément qui sera encore beaucoup plus considérable que l’Ouvrage [...] nous ferons usage de ces Mémoires avec toute la recoinnoissance possible.”

<sup>2</sup> Denis Diderot, D’Alembert Jean le Rond, and Louis de Jaucourt, “Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers,” ed. Alexandre Guilbaud et al. (Édition Numérique Collaborative et CRitique de l’Encyclopédie (ENCCRE), 2017). Volume X, Article “Minérales Eaux, (Chimie & Médecine.)”, 534. “Minérales Eaux, (Chimie & Médecine.) c’est ainsi qu’on appelle les eaux chargées ou imprégnées de principes minéraux en assez grande quantité, pour produire sur le corps humain des effets sensibles & différens de ceux de l’eau commune.”

chemists pondered the problem for many decades, contributing to the growing body of works on the subject.

Not all appreciated this large output. In 1781, Girard, a physician, wrote a rather bitter letter describing the state of mineral water knowledge. He claimed that despite a “deluge” of treatises on the subject, very few reached satisfactory scientific standards. This “enormous heap of paper” had only succeeded in leading the public deeper into ignorance. “[T]he complete history of acidulous and thermal waters”, Girard explained, “is an ocean without a floor and without borders in which barely a few beaches are known”. Following this rather pessimistic judgment of his contemporaries, he added that only the “unified *Lights* of several navigators” would one day conquer this “immense sea, and the treasures that we might find there”.<sup>3</sup> Alongside others in the field, Girard believed that mineral waters needed to be enlightened.

## Purpose, research questions, and structure

My thesis aims to bring new understandings to mineral waters of the French eighteenth century. A rapid survey of the subject shows two distinctive tendencies: first, mineral waters were at the centre of a vast and lively social world; and second, existing historiography has not investigated this social world, despite its clear ties to active research into the history of thermalism, and the larger field of the French Enlightenment.

The rich potential of mineral waters as a historical object becomes more obvious with further enquiry. Digging into the sources reveals the existence of three compelling dynamics. First, neither Girard nor Buc’hoz exaggerated their statements. A tremendous amount of scientific works on mineral waters was indeed produced throughout the eighteenth century. Not only were these treatises on mineral waters extensive, they also presented striking similarities to one another, suggesting the emergence of a standardised practice. The proliferation of scientific work on mineral waters was driven by a recent change in the public’s access to mineral waters. For the first time in the eighteenth century, mineral springs were bottled and sold across the French kingdom.

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<sup>3</sup> Correspondence from Girard to the *Société*, (5<sup>th</sup> May 1781), SRM 93B, dossier 30, Archives de la Société royale de médecine, Bibliothèque de l’Académie de Médecine, Paris (all archives from the *Société* will subsequently be abbreviated as ASRM). “déluge de livrets éphémères dont nous sommes tous les jours inondés. on croiroit à la vûe de cet amas énorme de papier noirée, qu’il ne reste plus rien à faire sur ce sujet. Mais hélas ! qu’on est bien détrompé. une étude réfléchie du petit nombre des meilleurs ouvrages en ce genre, ne tarde pas à faire naître l’affligeante idée, que l’histoire complete des eaux acidules et thermales, est un océan sans fond et sans bornes dont quelques plages sont à peine connues. Ce ne sera donc qu’aux forces et aux *Lumières* réunies de plusieurs navigateurs, qu’on devra un jour, la connoissance parfaite de cette mer immense, des trésors qu’on peut y trouver, comme des écueils et des naufrages qui y sont à craindre.” (Emphasis added).

This extensive commerce represents the second important dynamic of the period. In most historical accounts, mineral waters tend to be associated with the surge in spa town tourism of the nineteenth and early twentieth centuries, in parallel with the industrialisation that permitted consistent and affordable bottling.<sup>4</sup> One might not expect to find a large-scale commerce of bottled waters in the midst of the Enlightenment.<sup>5</sup> Yet, in the 1780s, the Paris reseller of mineral waters could expect shipments of several thousands of pints of water every month.<sup>6</sup> These numbers command attention. A mineral water could seemingly spring from anywhere, from the flat planes of Normandy to the sharp mountains of the Pyrenees, and new springs were being identified in all corners of the kingdom. It was no easy task to ship thousands of fragile, temperature and shock sensitive glass bottles for hundreds of miles on the backs of mules. In addition to complex logistics, this existence of this market inevitably implied a serious demand.

This broad and previously overlooked market would itself invite further research, but there is one final dynamic that must be added to the present enquiry. The rising interest in mineral waters quickly caught the attention of regulators. While the king's physician had long been charged with the administration of mineral waters, the late eighteenth century called for more hands-on management. The king and his ministers claimed their intent to protect the French subjects from fraud by closely monitoring the sale of bottled waters. The crown mandated the creation of institutions that were tasked with regulating the market and overseeing scientific inquiries into mineral waters. By necessity, these new regulators had to be versed in medicine and chemistry. This meant that medical experts became involved in the prescription of water, as well as its marketing and regulation.

The forces of markets, regulation and science were linked and entangled, so much so that the scientific enlightening of waters cannot be separated from their commodification, nor from their submission to government control. Disentangling these different forces and understanding their respective effects on the enlightenment of this unique remedy will be the primary aim of my work.

Having stated this purpose, several points arise, which have guided the structure of my study. The primary questions that I endeavour to answer are the following.

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<sup>4</sup> Jérôme Penez calls the nineteenth century of “fièvre thermale” (“thermal fever”). Jérôme Penez, “Les réseaux d’investissement dans le thermalisme au XIXe siècle en France,” *In Situ*, no. 4 (2004), 17.; Christopher Hamlin, *A Science of Impurity, water analysis in nineteenth century Britain* (Berkeley, Los Angeles, Oxford: University of California Press, 1990).

<sup>5</sup> On the longer history of thermalism, see: André Authier, Pierre Duvernois, and Christophe Lefebure, *Patrimoine et traditions du thermalisme*, vol. 1 (Toulouse: Privat, 1997).; Marie-Reine Jazé-Charvolin, “Les stations thermales : de l’abandon à la renaissance. Une brève histoire du thermalisme en France depuis l’Antiquité,” *In Situ* 24 (2014).

<sup>6</sup> Correspondence from Arnaud to the *Commission*, 64e assemblée, (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM.

- How was the supply chain of the mineral water market organised?
- Who were the regulators of mineral waters, and how did they enforce authority?
- What kinds of scientific investigations were conducted on mineral waters, by whom, and with what intents?
- What were the eventual consequences of the forces of market, regulation and science on mineral waters?

These questions will be explored over the course of this thesis. I will present a diverse collection of places and actors who were involved with mineral waters. My study will consider the entire mainland French kingdom, with occasional highlights of locations of special interest, over the course of a long eighteenth century. While there will be a focus on the 1772–1793 period, corresponding with the years of heightened activity from regulatory institutions, there will be various incursions into the late seventeenth and early nineteenth century to explore the continuity of select dynamics. The evolutions that I will be studying are closely tied to the development of the French Enlightenment, but only rarely did they originate in the period. There is therefore much to gain from considering a slightly longer period.

The thesis is organised into eleven chapters, which centre on different parts of the period at hand. Several follow a chronology from the early eighteenth century to the revolution, others are focused on the pre-revolutionary decades. The chapter division is thematic. The beginning of the dissertation traces the outline of the market of mineral waters, before venturing into the questions of legislation and regulation, to end on the scientific inquiries into mineral waters.

In my study, eighteenth-century mineral waters are not treated as actors. Rather, they are framed as complex objects that unpredictably appeared in various parts of the land, with no regards to state or property lines.<sup>7</sup> Historical actors, in turn, attempted to manage those waters according to varying sets of interests and constraints. These actors built reputations for the waters, attached stories and tradition to their usage and created a scientific framework within which they could be understood. They also affixed a price and market value. Mineral waters therefore enabled a large array of behaviours, conceptualisations, and ambitions, which reveal much about the inner functions of eighteenth-century society. The stance adopted by my thesis is to use the waters as a lens to understand that social world, the knowledge it produced, and perhaps most of all, the interaction between the two.

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<sup>7</sup> Though the waters themselves are central to my study, I will not be writing about the springs in terms of agency. My aim is rather to study the social worlds surrounding the waters. For more on this see the Methodology and theoretical approach section below.

## Background and prior research

### The Italian origins of ‘taking the waters’

In order to discern the intricacies of the science, market and regulation of early modern mineral waters, a general picture of the practices surrounding their consumption is necessary. What was a mineral water in the eyes of the average eighteenth-century individual? Who had a use for them? Where could they be found? Without answers to these questions, a study of the broader dynamics of the century could easily be misunderstood. For this reason, I will begin by establishing a few points of departure regarding the history, geography, and publics of the mineral waters for the time period at hand.

The origins of mineral water use are typically traced back to the Roman infrastructure of public baths. Springs used in the eighteenth century were commonly attested as having been used in antiquity.<sup>8</sup> The town of Vichy for example was originally a Roman settlement. Other springs, like Saint-Galmier (known as Badoit after the eighteenth century), also boasted Roman origins.

The medieval period shows no evidence that the use of mineral waters disappeared. While some Roman baths faded into ruins, accounts of the continued use of hot and cold springs for medical and sometimes religious purposes persisted during the Middle Ages. Water itself held an important place in medical practice and theory.<sup>9</sup> The early modern way of taking the waters had, however, some unique features when compared with ancient and medieval practices. While bathing or drinking waters were obviously immemorial practices, there was a novelty to the procedure of ‘taking the waters’, which entailed going to a spring in a medically supervised environment to use the waters as part of a limited-time cure. This was the habit that swept up the early modern public, and that can be directly connected to the later sensation dubbed “thermalisme” in the nineteenth century.<sup>10</sup>

The origins of this form of water consumption were not found in France but in Italy. As early as the thirteenth century, parts of Tuscany saw a revival of the practice of visiting mineral springs. Didier Boisseuil refers to this trend as a medieval form of thermalism.<sup>11</sup> The practices he describes resembled the

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<sup>8</sup> See for example in: M. Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages,” (Chez J. Sirot, Imprimeur Libraire, Place Saint Etienne, 1736), 153. In another example, the analyst Linacier discussed how historians and geographers believed that the waters of Vallers had been used in antiquity but were lost to time because of some unknown accident. See: Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

<sup>9</sup> Marie-Thérèse Lorcin, “Humeurs, Bains et Tisanes : L’eau dans la médecine médiévale, L’eau au Moyen Âge,” *Senefiance* 15 (1985).

<sup>10</sup> “Thermalisme” refers to the broad set of practices centring around the use of mineral waters (sometimes called “thermal waters”) for medicinal and recreational purposes. In this thesis I will use the anglicised form of the term, thermalism.

<sup>11</sup> Didier Boisseuil, *Le Thermalisme en Toscane à la fin du Moyen Âge: Les bains siennois de la fin du XIIIe siècle au début du XVIe siècle* (Rome: Publications de l’École française de Rome, 2002). See this phenomena also addressed in: Maria Conforti, “Subterranean fires and chemical

water taking habits of later periods. The springs of Tuscany were visited by the affluent urban public of the early Renaissance, and an entire infrastructure was built to accommodate them. The experience of visiting the springs combined medical care with entertainment. This revival of water usage extended to a wider European context, as the German world also embraced the practice in the late medieval period.<sup>12</sup>

However, France remained “largely unmoved by the fad for the hot-spring and the mineral bath”, as Laurence W. Brockliss argued.<sup>13</sup> He traces the history of mineral waters in seventeenth century France, placing the beginnings of the French interest in waters around the late sixteenth century. Because of their commitment to Galenic medicine, French court physicians were unlikely to send their rich patients to the springs. The only mineral springs which saw any attendance during the fifteenth century were situated in the Béarn, which at the time was not part of the French kingdom.<sup>14</sup>

Brockliss attributes the initial attention to mineral springs to the influence of Paracelsian medicine, first in the Alps, and only reaching the court around 1574, due to a reluctance to collaborate with Protestant physicians. The first high-profile visit to a spring took place when the childless King Henri III (r. 1574–1589) visited the spring of Bourbon Lancy in 1580 with the Queen in the hopes to find a cure for the couple’s infertility. Although this did not work, and Henri was in fact the last of the Valois dynasty, the major overhaul to the facilities at Bourbon Lancy in preparation for the king’s visit reinvigorated interest in the waters and their potential curative abilities.<sup>15</sup> After this, many French springs, such as Forges, Vichy and Plombières, saw an increase in visitors. This rise in popularity was encouraged by repeated visits from members of the court. Esteemed guests, such as Madame de Montespan (1640–1707), Louis XIV’s (r. 1643–1715) *Favorite*, often visited the waters. But this patronage was to a certain extent manufactured. Physicians who took care of a particular spa lobbied at the court to bring noble guests to their towns, keenly aware that this would promote the waters to more visitors.

The basic practices for taking the waters were clearly established during the seventeenth century. Waters could be used in different ways. Typically, cold and aerated waters were prescribed as daily drinks, according to the

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exhalations: Mineral waters in the Phlegraean Fields in the early modern age,” in *Le Thermalisme: Approches historiques et archéologiques d’un phénomène culturel et médical*, ed. John Scheid et al. (CRNS Éditions, 2015).

<sup>12</sup> The medieval revival of German springs has also been likened to thermalism. See: Frank Fürberth, “L’essor de la balnéologie dans le monde germanique à la fin du Moyen Âge,” in *Séjourner au bain: Le thermalisme entre médecine et société (XVIe–XVIIe siècle)*, ed. Didier Boisseuil and Marilyn Nicoud (Lyon: Presses Universitaires de Lyon, 2010).

<sup>13</sup> Laurence W. Brockliss, “The Development of the Spa in Seventeenth-Century France,” *Medical History*, n° 10 (1990), 23.

<sup>14</sup> See: Documents concernant le Béarn, H//86, dossier 8, 144–174, Archives Nationales, Paris, Pierrefitte-sur-Seine (subsequently abbreviated as AN).

<sup>15</sup> Pierre Chevallier, *Henri III : roi shakespearien* (Paris: Fayard, 1985).

schedule of a cure. Warmer springs were used in baths and showers, preferably under the supervision of a qualified physician. For those who could afford the trip to the spring, the waters were accessible in virtually infinite quantities, which was a large part of their appeal. No other remedy could be taken for weeks on end at no further cost. But mineral waters were also criticised by some physicians, who believed the excitement over their remedial powers to be over-stated. Seventeenth-century mineral waters already had detractors and passionate defenders.<sup>16</sup> These conflictual attitudes would only heighten the interest of the public in later decades.

## Mapping eighteenth-century springs

A tangible way of viewing the enthusiasm of the eighteenth-century public for mineral waters is to place the springs on a map. New mineral springs were regularly being identified. After describing the waters of England, Germany, Spain and Italy, the physician Gastellier declared: “france is of all kingdoms that in which these springs are the most common. there is no small county of our france which does not possess two or three of these sources.”<sup>17</sup> This was somewhat exaggerated; not all regions were equally endowed with waters. Typically, the mountainous regions of the Alps, the Pyrenees and the Massif Central were home to a large quantity of mineral springs, while the planes of Brittany, Normandy, the Orléanais, and the Provence accounted for fewer.

This uneven natural distribution was in part compensated by explorative works in natural history.<sup>18</sup> During their travels, naturalists noted every spring of potentially mineral nature.<sup>19</sup> Their reports sometimes stated the hope to see the spring they identified one day becoming a popular destination for patients.

The incessant search led to the discovery of a multitude of new springs. Some were in highly impractical places. The waters of Saint Suliac for example were discovered near the ocean, in an area that was only accessible when

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<sup>16</sup> See Jean Pietre, “An visceribus nutritis aestuantibus Metallicarum aquarum potus, salubris?”, (1633), cited in: Brockliss, “The Development of the Spa in Seventeenth-Century France.”, 42.

<sup>17</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “la france est de tous les royaumes celuy où ces sources sont les plus communes. il ny a pas de petite contrée de notre france qui ne possede deux ou trois de ces sources.”

<sup>18</sup> See for example: Jean Louis Alléon-Dulac, “Mémoires pour servir à l'histoire naturelle des provinces de Lyonnais, Forez et Beaujolais,” (Chez Claude Cizeron, Libraire, à la descente du Pont de pierre, du côté de St. Nizier, 1765), 307. The author of this work surveyed the Lyon region, and insisted on the importance of water resources, including potential new mineral fountains. A similar dynamic could be seen in surveys of foreign regions. See for example Joseph Banks travels to Iceland and his mentions of mineral springs in: Anna Agnarsdóttir, ed., *Joseph Banks, Iceland and the North Atlantic 1772–1820, Journals, Letters and Documents* (Hakluyt Society, 2016), 116.

<sup>19</sup> Antoine Augustin Parmentier, “Observations sur la difficulté de bien proceder a l'analyse des Eaux minerales”, (1773), Ms pa 206, f38–f49, Archives de l'Académie des Sciences, Belles Lettres, et Arts de Lyon, Lyon, (subsequently abbreviated as AAL). “il n'y ait pas d'objets qui parvissent avoir plus meritè l'attention des Chymistes et des naturalistes que les Eaux Minerales”.

the tide was low. At high tide, the spring itself was under seawater. But since mineral springs were less common in Brittany, the discoverer of the water nevertheless took care to study it, while lamenting its lack of accessibility, and hoping that a better location could later be found.<sup>20</sup> The same author was later made aware of a different spring in Veaugarni, also in Brittany. Upon finding out that it was also inaccessible, he recounted spending several days in the company of the owner, digging through the country in several places to find a better location to build a fountain.<sup>21</sup> Similar examples could be found throughout the eighteenth century. The popularity of mineral waters meant that obstacles to their use did not always discourage the owners.<sup>22</sup> The high price of popular springs rather encouraged them to try to rival established spas with lower costs, leading to the broad number of mineral springs found and advertised throughout the kingdom.<sup>23</sup>

What did a map of eighteenth-century mineral waters look like? There are of course many answers to this question. A map of 1700 would look very different from a map of 1750, 1770, and so on. The waters discovered by naturalists sometimes garnered little more than a single mention in a text. Others were discovered, studied, and later used by crowds of patients. The following map contains (almost) every water mentioned in the source material used throughout my thesis.<sup>24</sup> The map is limited to waters that were located in the French kingdom or sold within its borders.<sup>25</sup>

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<sup>20</sup> Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>21</sup> Analysis of the waters of Veaugarni by Chifoliau, (1783), SRM 93A, dossier 19, ASRM.

<sup>22</sup> In another case, a man named Beaumont wrote about his discovery of a spring at the bottom of a valley in Switzerland. These waters, although promising, were barely accessible on foot. This did not deter Beaumont, who drew complex plans for the earthworks that would make the spring accessible to the public. See: Deyeux, le Roux, "Rapport sur un mémoire intitulé Description de la vallée de Lauben avec un précis analytique de ses eaux sulfureuses par le C. Albanis Beaumont", (An IX), AJ/16/6697, AN.

<sup>23</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. "La découverte de la fontaine de noyers est due au hasard, comme presque tous les remèdes nouveaux; le propriétaire qui est un meunier, réfléchissant un jour sur la cherté des Eaux de Vichy, dont il faisait usage, sur la difficulté de s'en procurer d'une part et de l'autre sur la conformité du goût qu'il semblait trouver avec celles de son puits, en fit l'observation aux chirurgiens de Lorris qui en Effet jugèrent que c'était une fontaine minérale."

<sup>24</sup> This map is by no means fully representative of eighteenth-century mineral springs in general. Rather, it is an artefact of the sources I have gathered. The cluster of springs around Lyon for example is a direct result of my archival enquiry at the Academy of Lyon and the city's municipal archives. Had I made a similar enquiry in the Pyrenees, odds are, that region would present a cluster too. Additionally, a few springs that I did come across could not be added to the map. Some springs have names which are difficult to identify, (i.e.: the source of "Bars", sold in Brioude which I was not able to place), others changed name since the eighteenth century, or were referred to under widely different names. Finally, some springs were called by the name of a town, when they in fact refer to a variety of different kinds of waters (i.e.: the "seltz" waters). For further discussion on the maps, see Appendix n°[9].

<sup>25</sup> The borders of France moved throughout the eighteenth century. The map base used here is a depiction of the borders in ca. 1790. See Appendix n°[9] for further detail on the map legend.



Figure 1.1 Map of the mineral waters found or sold within the mainland French kingdom (1770–1810). Map by author.

This map clearly shows that the interest in mineral waters had grown past the elite-driven spa town visits of the seventeenth century. A few high-profile visits could not sustain such a wide number of locations, as there simply were not enough royals to travel to ninety different springs. The density of the map suggests that far from being limited to a particular location, there was a kingdom-wide interest for these remedies.

The map is not exhaustive, and disproportionally represents the waters that were of interest to analysts and regulators. It can nevertheless present noteworthy trends. The map follows the geological map of France, showing a cluster of springs around the Massif Central and in the Alps. But it also shows economic incentives. The abundance of waters around Paris came from the high number of patients within the capital, which both encouraged naturalistic research in the region and could sustain a larger number of active springs through commerce. Additionally, it shows that while the French public marked a preference for its national waters, German and Low Countries waters also found success among the French.

## Cure-alls

Early modern mineral waters were unequivocally classified as remedies.<sup>26</sup> Whether in spas or in bottles, mineral waters were a medical product. This medical definition had several consequences. First, they were viewed as potent, and could therefore be dangerous if used recklessly.<sup>27</sup> For example, it was said of the waters of Vichy that while they cured many illnesses, they were “harmful in all inflammations, in abscesses, in ulcers of the lung”, as well as another eleven conditions.<sup>28</sup>

The second consequence of this remedial classification was social. The worlds of mineral water handlers and drink sellers rarely intersected on any meaningful level. In my enquiries, I have found very few points of contact or commonalities between mineral water merchants and the world of the *limonadiers*, wine makers, or even with the world of common water distribution. The people involved had different social and professional backgrounds, and did not seem to share much expertise.

Mineral waters were understood to cure hundreds of diseases. This conviction was inherited from seventeenth-century traditions.<sup>29</sup> Most scientific descriptions of mineral waters concluded with a list of conditions that could be cured by that spring’s water. This was especially common in printed works on mineral waters. Figure 1.2 shows an example of the illnesses that were said to be cured by the waters of Bourbonne, altogether listing forty-seven kinds of ailments.<sup>30</sup>

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<sup>26</sup> Some wealthy individuals could afford to drink mineral waters in quantities that would veer closer to daily drink than one-time remedy. But these cases only ever concerned the highest of elites, and even then, they were the exception rather than the rule. Some accounts of this can be read in: Anne-Marie-Louise-Henriette d’Orléans Montpensier, “Mémoires de Mlle de Montpensier, petite-fille de Henri IV, collationnés sur le manuscrit autographe avec notes biographiques et historiques,” (par A. Chéruel, à Paris, 1858–1859), 98, 515.

<sup>27</sup> David Harley, “A sword in a madman’s hand: professional opposition to popular consumption in the waters literature of southern England and the midlands, 1570–1870,” *Medical History*, 10 (1990), 52.

<sup>28</sup> Emmanuel Tardy, “Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage,” (A Moulins, Chez Jean Faure, Imprimeur-Libraire, rue de Paris, 1755), 55. “Elles seroient nuisibles dans toutes les inflammations, dans les abscess, les ulcères du poulmon, la phtisie, la pulmonie, certaines fièvres lentes, fièvres hectiques ; dans les hidropisies confirmées, les fièvres continuës, ou subintrantes ; dans l’Épilepsie idiopatique, qui a son siège dans le cerveau.”

<sup>29</sup> In this 1648 work, the waters were also described as curative for a large number of ailments. Extract from Etienne Borie, *Traité tres necessaire a ceux qui desirent boire les eaux de Vic*, (par Jean Mante D.M. imprimé a Aurillac par Etienne Borie, 1648), recalled in: *Analysis of the waters of Vic sur Cère* by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

<sup>30</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages.”, Table des sujets contenus en ce Livre.

T A B L E.		T A B L E.	
De la douche ,	160.	Et de la paralysie ,	220.
De l'usage des bouës ,	171.	De l'épilepsie ,	227.
Des Maladies différentes où les Eaux de Bourbonne sont salutaires ,	176.	Des vers Et des maladies qu'ils engen- drent ,	229.
De la foiblesse d'estomach ,	177.	De l'affection de la vûë Et de l'oüie ,	230.
Des douleurs Et coliques d'estomach ,	180.	Des affections scorbutiques ,	233.
Des dégoûts Et des vomissemens ,	182.	Des fièvres errantes ,	236.
Des douleurs Et coliques de bas ventre ,	184.	De l'astme ,	239.
Des cours de ventre , des flux de sang, Et des flux hépatiques ,	187.	Des retentions d'urine ,	241.
Des obstructions du méfentere ,	190.	Des fractures , foulures , entorses Et lu- xations .	243.
De la cacochilie Et cacochimie .	193.	Des enchiloses ,	248.
Des embaras du foye Et de la ra- te ,	197.	Des contusions , des ruptures Et des tref- suillemens de tendons ,	251.
De la jaunisse ,	200.	Des coups de fer Et de feu ,	253.
Des humeurs froides ou scrophuleu- ses .	203.	Des atrophies ou amaigrissemens des parties ,	255.
Du rachitisme ,	208.	Des suites de la petite vérole ,	256.
Des rhumatismes , des sciaticques Et de la goûte naissante ,	213.	Des suites de couches .	257.
Des douleurs de reins habituelles ,	218.		
Des affections soporeuses , de l'apoplexie		Fin de la Table.	

Figure 1.2 Table of contents from M. Baudry's *Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages*. This section of the table of contents lists the various diseases said to be cured by the waters of Bourbonne, including stomach aches, obstructions, rheumatisms, parasites, fevers, torn muscles, broken bones, epilepsy, asthma, etc. Source gallica.bnf.fr / Bibliothèque nationale de France.

Similar lists could be found for most popular springs. The following is a standard set of recommendations from 1775 indicating when to take the waters of La Mothe:

The waters of Lamothe taken as a drink are diuretic & laxative. They purge delicate temperaments, support the tone of the stomach, fortify it, promote digestions, & restore them when they are out of order: they divide the lymph when too dense, dissipate obstructions, prevent the progress of tumours, resolve them & heal them.<sup>31</sup>

<sup>31</sup> Joseph Raulin, "Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris," (De l'Imprimerie de Claude Herissant, rue Neuve Notre-Dame, 1775), 10–11. "Les Eaux de Lamothe prises en boisson sont diurétiques & laxatives. Elles purgent les tempéramens délicats, soutiennent le ton de l'estomac, le fortifient, favorisent les digestions, & les rétablissent lorsqu'elles sont dans le désordre: elles divisent la lympe trop

On average, a mineral water was said to cure at least eight different ailments, and to cure them exceptionally well.<sup>32</sup> Some physicians worried that mineral waters were perhaps prescribed too liberally.<sup>33</sup> But generally, few doubted their efficiency altogether. The diseases cured by mineral waters were typically linked to the mineral composition, albeit sometimes in a tenuous way. When describing a particular water, most authors indicated the main component of the water, with the more common ones being salt, sulphur or iron. They then indicated some medical properties, using a variety of different terms. The most common were “diuretic”, meaning they facilitated the production of urine; “appetising”, meaning they stimulated hunger; “tonic”, alluding to their capacity of reinvigorating various vital forces; “purgative”, as in, causing the body to be purged. Other qualifiers included “cathartic”, “anti-scurvy” and “emollient”.<sup>34</sup> These qualities were sought after in other remedies too. Many medicinal recipes were taken specifically for their purgative effects for example. But the mineral waters usually combined several medical properties. If a mineral water was both purgative and tonic, it was believed that the tonicity would manifest itself only after the body had been purged. These layered effects were what made mineral waters valuable among other remedies.

Three areas of physiology were specially addressed by mineral waters. The most common was the digestive system, followed by the various conditions of the skin. These two problem areas reflect the two ways of taking the waters, either by drinking, or by bathing. Drinking remedied the insides, and bathing cured the surface of the body.<sup>35</sup> The third most mentioned diseases were gynaecological in nature. Conditions related to women’s fertility and disorders of menstruation were frequently addressed by mineral waters.<sup>36</sup> In some

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dense, dissipent les obstructions, previennent les progrès des tunneurs, les résolvent & les guérissent. [...] L'eau de [Verdusan] est dissolvante, légèrement purgative, apéritive, diurétique, diaphorétique, stomachique, fébriguge, emménagogue. Elle est propre dans la cocochymie, & dans tous les cas où la fibre est relâchée; elle est efficace dans les obstructions des visceres, dans les fièvres intermittentes, la jaunisse, le dérangement, & la suppression des régles, & des hémorroïdes dans les fleurs blanches, &c.”

<sup>32</sup> There was a precedent for such claims, and much like the use of the simples – the name given to medicinal plants – came under fire during the seventeenth century for being prescribed as a cure to every ill, mineral waters received similar critiques. India Mandelkern, “Taste-Based Medicine,” *Gastronomica* 15, no. 1 (2015), 13.

<sup>33</sup> This kind of critique was often made by physicians who expressed scepticism regarding the waters’ popularity and unchecked market. See: Tardy, “Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.”, 17–23.; Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL.

<sup>34</sup> Raulin, “Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris.” “cathartique”, “antiscorbutique”, “émolliente”, “diurétique”, “apéritive”, “tonique”, “purgative”.

<sup>35</sup> This estimate is based on Raulin’s treatise. Of all diseases mentioned, seventy relate to the digestive system, and fifty-two concern skin illnesses. *Ibid.*

<sup>36</sup> Other commonly targeted illnesses were “obstructions”, a term describing any kind of blockage in the body. Bone and lung related diseases, as well as disorders of the bile, or fevers, were also relatively frequently mentioned. Finally, some conditions of the mind were also treated by

examples, the waters were used for non-therapeutic applications. In one analysis, the author mentioned that the waters, kept in a bottle, made an excellent cosmetic.<sup>37</sup> Those who lived close to mineral springs occasionally used them to clean and cook. However, in most cases, mineral waters were too restricted and expensive to serve other purposes than medical ones.

### *Placing hope in mineral water cures*

The medical powers of mineral waters were not doubted by most eighteenth-century actors. This raises an important question, which admittedly leads me to the edge of traditional historical enquiry, but nevertheless deserves to be brought up. Did the mineral waters actually work? Did the patients who used them sincerely believe in their abilities? This in turn gives rise to further questions, not all of which can be answered. It is not the duty of the historian to diagnose illness, and with hundreds of years of distance, I could never hope to state whether patients experienced true healing. With that being said, the question should not be evaded altogether.

The early modern consensus assumed that mineral waters were a potentially effective remedy, but one which offered no categorical promises of restoring health. Though this lack of assurance might seem detrimental to the popularity of springs, it is no different from the use of most remedies. Modern medicine, though undoubtedly effective in its goal to extend life, does not offer a blanket guarantee in the treatment of all diseases. Plenty of medical procedures are lengthy, painful, and ultimately lead to few improvements. Patients still engage with these procedures with the knowledge that they might fail, because hope is a powerful factor in matters of health. I believe this sentiment to have been true in the eighteenth century. When faced with the reality of chronic pain, infertility, disability or even death, many patients were willing to try the remedies of mineral waters. If they saw no improvement in their condition, rather than blame the mineral spring, they were likely to frame it as an act of fate, an inevitability that the waters would never have been able to cure.

In addition, there is much to indicate that mineral waters did have some tangible effects on eighteenth-century bodies. Setting aside the mineral contents and the question of whether waters produced any effects beyond placebo, it is probable that for some conditions, a diet of uncontaminated water and the lighter food that patients would be made to eat at spas was genuinely beneficial. The rest afforded by a stay at the spas had the potential to heal damaged bones and muscles, without the waters being technically implicated. In a time

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waters, chiefly hypochondria and melancholia. On those latter conditions, see: Analysis of the waters of the Aveyron by Caucanas, (1802), AJ/16/6697, AN. “ce cadre est rempli, comme le sont ordinairement ceux du même genre, mais aujourd'hui pour les médecins des Eaux minérales; ou l'on trouve quelquefois un peu de prévention, maladie de l'esprit humain dont il est d'autant plus difficile de se guérir qu'on ne se doute même pas qu'on en soit atteint.”

<sup>37</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL.

before pain-relief medication, it should also be considered that any improvement in that regard might have been seen as beneficial, no matter how minute. So while it might be difficult to obtain precise data on the true remedial effects of early modern mineral waters, the patients and medical practitioners of the eighteenth century had discernible, and to an extent, sensible reasons to believe them to be efficient.

## A profile of mineral spring patients

The question of the eighteenth-century spa visitors has received scholarly attention. The English town of Bath, the spa town that has attracted the most interest from historians, became famous not merely for its remedial qualities and its miracle cures, but also for its attendance, elaborate code of conduct, political intrigue and intricate sociability.<sup>38</sup> When studying the complexities of the social relations that took place in Bath, the medical aspects of those waters appear almost secondary.<sup>39</sup> One could therefore wonder if similar dynamics took place in the French spas. By and large, this was not the case, even for the most famous resorts. Those who drank French mineral waters were primarily patients. When the rich and powerful did visit the spas, they were solely attempting to remedy what they perceived as an otherwise incurable disease.

In the seventeenth century, high-profile visits had helped to put some towns on the map. During the eighteenth century, when chronicles talked about the history a spring, they often mentioned the past visits of some illustrious character. The waters of Usat received the visit of the famed Cardinal de Richelieu, who had reportedly been healed by the waters.<sup>40</sup> A text on the waters of

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<sup>38</sup> On this, see: Annick Cossic's extensive work on many aspects of Bath and British spa sociability. Annick Cossic and H el ene Dachez, eds., *La sociabilit e en France et en Grande Bretagne au si cle des Lumi eres* (Le Manuscrit, 2013).; Annick Cossic, *Bath au XVIIIe si cle : les fastes d'une cit  palladienne* (Presses universitaires de Rennes, 2000).; Annick Cossic and Patrick Galliou, eds., *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries* (Newcastle: Cambridge Scholar Press, 2006). For an example of similar dynamics of sociability in Tunbridge Wells, see: Rachael Johnson, "Bell Causey at Tunbridge Wells: Master of Ceremonies, Matchmaker, or Pimp?" (*Thermalisme et Politique (XVIIe-XIXe si cle)*, 2021).

<sup>39</sup> This was never fully the case, as Bath was still a spa town where many travelled to be healed. Bath also had a dedicated hospital. See: Audrey Heywood, "A trial of the Bath waters : the treatment of lead poisoning," *Medical History*, n  10 (1990). Eighteenth-century physicians also wrote pamphlets discussing the medical applications of Bath's waters. See: George Cheyne, "An essay of the true nature and due method of treating the gout : written for the use of Richard Tennison, Esq. : together with an account of the nature and quality of Bath-waters, the manner of using them, and the diseases to which they are proper : as also, of the nature and cure of most chronical distempers : not publish'd before," (London : printed for G. Strahan, at the Golden Ball, over against the Royal Exchange in Cornhill, and sold by W. Mears, without Temple-Bar, and J. Leak, at the Bath, 1724).; Rice Charleton, "Three tracts on Bath water," (Bath: Printed by R. Cruttwell; for W. Taylor, in Church-Street, Kingdom Buildings, and sold by R. Baldwin, no 47, in Pater noster-Roz, London, 1774).

<sup>40</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A, dossier 16, ASRM.

Bouillaut aimed higher, and cited the rumour claiming that William the Conqueror himself had visited the waters in his time.<sup>41</sup> According to a 1754 treaty, the waters of Spa boasted attendance from King Henri III of France, Queen Marguerite de Valois, an English king, a Danish king, a Swedish queen, a Russian tsar, and a “quantity of Princes” which were not even worth listing by name.<sup>42</sup> When no such distinguished visit had occurred, some authors mentioned local people of renown. The waters of Saint Honoré for instance were regularly used by the local Count and Countess of Aunay.<sup>43</sup> While such elite visitors could later be flaunted for prestige, they sometimes caused issues for the towns that struggled to host their large entourage.<sup>44</sup> This was however a rare occurrence. Most mineral water users, be it at the spa or those who purchased bottled waters, were not part of high society.

The users of waters varied in age. The springs which boasted a capacity to cure rheumatism for example, tended to cater to an older demographic. Since fertility was one of the most common ills that claimed to be cured by the waters, young and middle-aged women were frequently found among the drinkers. Some waters were said to restore the beauty of young women. Children were also among the patients. The waters of Châtel-Guyon were said to be “suitable for children; they can be given to them with confidence at the age of five”.<sup>45</sup> The town of Bagnères-de-Luchon provided a long list of visitors, dating from 1811. This list detailed the different cures that had been performed by the waters, including the story of a thirteen-year-old girl who suffered from joint pain, caused by her exposure to persistent rain, as she was a shepherd.<sup>46</sup> As these examples suggest, mineral waters were prescribed to both men and women. Many of the high-profile visits to the spas were made by the women of the royal household. In addition, plenty of women of moderately high status travelled to the spring, sometimes alone, or with servants.<sup>47</sup>

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<sup>41</sup> Analysis of the waters of Bouillaut by Fleury l’Ainé, (1776), SRM 91B, dossier 33, ASRM.

<sup>42</sup> Jean Philippe de Limbourg, “Traité des Eaux Minérales de Spa,” (À Leide, De l’inpr. d’Elie Luzac, fils, 1754), vii. “plusieurs personnes très augustes, qui sont venuës chercher la santé dans les Eaux de Spa, parmi lesquelles elles ont l’honneur de compter Henri III Roi de France, Marguerite de Valois Reine de France, Charles I, Roi d’Angleterre, un Roi de Dannemarck, une Reine de Suede, le Czar Pierre le Grand, quantité de Princes, dont je supprimerai la liste pour ne parler que des dernières saisons”.

<sup>43</sup> Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM.

<sup>44</sup> See Chapter 2.

<sup>45</sup> Raulin, “Exposition succincte des principes et des propriétés des eaux minérales, qu’on distribue au bureau général de Paris.”, 18. “Ces eaux sont également propres pour les enfans ; on peut leur en donner avec confiance à l’âge de cinq ans, demi septier, ou huit onces : lorsqu’ils ont atteint huit ou neuf ans, ils peuvent en prendre une chopine ou une livre”.

<sup>46</sup> “Mémoire sur les différentes maladies soignées par les eaux de Bagnères de Luchon”, (1811), AJ/16/6697, AN.

<sup>47</sup> This was also true elsewhere in Europe. One of the hallmarks of British spa sociability was that it included many women, often unaccompanied. Annick Cossic, “Spa Sociability and the Reformation of the Nation: the Case of Hannah More in Georgian Bath (1792–1802)” (Thermalisme et Politique (XVIIe–XIXe siècle), 2021).

Travelling to the spa was expensive. Buying bottled waters was cheaper, but still represented a notable expense. This created an obvious barrier of access to mineral waters for a large portion of the public. It was however a time-honoured mission of most spa towns to be charitable, which manifested in the providing of cures for the poor who were thought to be deserving of such care.<sup>48</sup> This concerned many patients each year. A visitor of the waters of Usat recounted: “During my stay at the Baths, I was pleased to see all the Poor. There were more than forty.”<sup>49</sup> This charitable mission, although selective, did shape the attendance at the spa during the eighteenth century and beyond.<sup>50</sup> The report on the patients of Bagnères reported that 168 indigents had been treated during the 1811 season.<sup>51</sup> Along with the poor, soldiers were expected to be granted free amenities. The physician Laprade wrote about the waters of Montbrison, stating that the “dragons of Orléans” had stayed and taken the waters while they passed through the county.<sup>52</sup> If they had been injured during their service, soldiers could also be treated at a spa free of charge. The report on the waters of Bagnères mentioned that forty soldiers had been treated for the year 1811. These figures show that the poor and soldiers held a significant presence at the spas.<sup>53</sup>

Overall, the public of the eighteenth-century spa was of two kinds. There were those who could afford the lengthy travel and the costs involved with staying at the spring. This public was mostly comprised of the bourgeoisie, merchants, artisans, and men and women of low nobility. This first group was also more likely to be purchasing bottled water. The other category consisted of those who received the waters for free, aligned with the charitable mission expected of spa towns.

## Austere spas

The rare visits of high-ranking guests taking the waters, and the presence of the poor and the military goes against common assumptions of what historical spas looked like. The imagery of spa towns typically includes luxurious facilities, decadent architecture, and a chic cosmopolitan public. These images are

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<sup>48</sup> Olivier Faure, “Un thermalisme populaire dans la première moitié du XIXe siècle” (Thermalisme et Politique (XVIIe-XIXe siècle), 2021).

<sup>49</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A, dossier 16, ASRM. “Pendant mon séjour aux Bains, je me fis un plaisir de voir tous les Pauvres. Ils étoient plus de quarante”.

<sup>50</sup> The process of slowly removing the poor from spa towns only took place towards the end of the nineteenth century. See: Faure, “Short Un thermalisme populaire dans la première moitié du XIXe siècle.”

<sup>51</sup> “Mémoire sur les différentes maladies soignées par les eaux de Bagnères de Luchon”, (1811), AJ/16/6697, AN.

<sup>52</sup> In an analysis of the waters of Montbrison, the author mentioned that the “dragons of Orléans” recently stayed at the town to drink the waters. Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “dragons d’orléans”.

<sup>53</sup> “Mémoire sur les différentes maladies soignées par les eaux de Bagnères de Luchon”, (1811), AJ/16/6697, AN.

wrapped-up into a form of old-world nostalgia, which has been utilised by modern spa towns to capitalise on a sense of past grandeur to attract new publics.



Figure 1.3 The Grande Grille spring in modern-day Vichy. This water was the most popular of the Vichy springs in the eighteenth century, but its environment today retains little from the original amenities. Photo by the author.

This vision can lead to inaccuracies in interpreting eighteenth-century phenomena. The spa of the French Enlightenment was no place of luxury, nor did it represent a clear prefiguration of upcoming extravagance. This is an important distinction to make, because the humble state of the French spas reveals much about the kinds of practices that took place there, and the reasons that motivated those who visited them. A luxury is, by definition, something that is not strictly necessary. If patients were not enticed to visit the spas for the chance of receiving high quality service, it implies that they mostly visited them out of necessity.

The association between spas and wealth did not originate in France. In Italy, the late medieval practice of taking the waters was imbued with a pastoral ideal, and those who visited these locations did so in part for the charm of the towns, and there was an appreciation for the gentlemanly demeanour of the visitors.<sup>54</sup> In England, the association between water taking and high society started to take hold in the late seventeenth and early eighteenth century.<sup>55</sup> In the low countries, the town of Spa, although less focused on sociability and entertainment, still held a code of conduct and provided amenities aimed at the wealthy.<sup>56</sup> This was not the case in early modern France, and would not be for the entire eighteenth century.

French spas were, for the most part, small, not particularly rich, and the installations ranged from modest to barely existent. Roy Porter described how, in comparison to the charming early modern Italian spas, the French equivalent “remained rather sober and austere”.<sup>57</sup> Visiting the spa was not a pleasant affair, especially for wealthy visitors who were accustomed to luxury. Brockliss describes some of the impressions of elite guests in the late seventeenth-century French spas. He quotes for instance the poet Boileau who visited the waters of Bourbon in 1687, saying: “I will now look at the waters and the medicines that I will swallow as penances that are imposed on me”.<sup>58</sup> This opinion of the spas was found again and again.<sup>59</sup> As Brockliss summarised, “No one wanted to stay at a French spa if they could help it.”<sup>60</sup>

The descriptions of spa towns made by apologetic physicians and exasperated inspectors over the years confirm that the complaints of guests were not entirely unfounded. Patient facilities were often lacking. Baudry, in his description of the town of Bourbonne-les-Bains, described the modest installations that were available for visitors. He explained that a military hospital was in the process of being built, which should soon relieve pressure on the hosting capacity of the town. This suggested that when he wrote his treaty, the military and civilians were hosted in the same places, which likely was not to the taste of all guests. But Baudry argued that one should not envy the opulence of

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<sup>54</sup> Roy Porter, “The Medical History of Waters and Spas,” *Medical History* 34, no. 10 (1990), ix.

<sup>55</sup> Cossic, *Bath au XVIIIe siècle : les fastes d'une cité palladienne*.

<sup>56</sup> “Récit du voyage de sa majesté l'empereur Joseph II. dans les Pays-Bas l'année M. DCC. LXXXI.: avec plusieurs anecdotes,” (Chez P. J. Hanicq, Imprimeur & Libraire près la Baille de fer, 1781).

<sup>57</sup> Porter, “The Medical History of Waters and Spas.”, ix.

<sup>58</sup> Brockliss, “The Development of the Spa in Seventeenth-Century France.”, 44. “Boileau came to see his sojourn at the station not as a cure but a penance: “je m'en vais regarder dorenavant les eaux et les medecines que j'avalerais comme des penitences qui me sont imposees plutost que comme des remedes qui doivent produire ma sante.”

<sup>59</sup> See for example Voltaire's dramatic complaints regarding his stays at various spas in: Jean Balcou, “Deux philosophes aux eaux. De Voltaire à Diderot,” in *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*, ed. Annick Cossic and Patrick Galliou (Newcastle: Cambridge Scholar Press, 2006), 228.

<sup>60</sup> Brockliss, “The Development of the Spa in Seventeenth-Century France.”, 39.

other spas when coming to Bourbonne. The waters were made to restore health, not to help the visitors in succumbing to the appeal of “vain & superfluous things”.<sup>61</sup>

Even in relatively well-known spas like Vichy, the installations were much simpler than one might imagine. The intendant François Chomel described the baths as being little else than “muddy holes”, which he admitted were not to the liking of delicate people.<sup>62</sup> He also described the contraption which had been designated as ‘the shower of the poor’, which was a hole in the ground, located where the baths were emptied after being used. So, while the paying guests used some rather plain installations, the poor had to make do with used water.

In 1778, similarly underwhelming facilities were described at the town of Bagnères. A letter detailed the damage caused by the practice of digging too many bathtubs so that more people could use the spring at once. This, incidentally, explains why Chomel called his local tubs “muddy holes”. The baths were not always built out of stone or wood, sometimes they were simply dug in the ground and the water filled them naturally. But in Bagnères, the installations were apparently so unpleasant and dug so deep that they evoked “the horror of tombs”.<sup>63</sup> Notably, the author counted fifty-eight of these rustic bathtubs, indicating that there was a demand for large capacity, but there were not enough funds to build baths out of quality materials.

The hosting of patients varied according to the town. At the waters of Verdusan, a 1778 letter described the local inn and its relatively high capacity, being able to host eighty visitors along with their servants.<sup>64</sup> In smaller towns where no other lodging could be found, locals often hosted patients in their own homes. The arrangement allowed for the continued stay of guests, but while it was functional, it was not luxurious.

These bare-bones amenities did lead to some complaints, most of them coming from richer visitors. Their arguments, especially towards the end of the century, were moral in tone. Behind most grievances lay the practices of the free users of the waters. The sentiments towards soldiers in eighteenth-century France were complex, torn between an ideal of patriotism and the liabilities that off-duty soldiers represented. Towns frequented by soldiers could

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<sup>61</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, Description. “[Les villes superbes] fournissent plus abondamment & plus heureusement, sans doute, les choses vaines & superflues ; elles présentent d’une main les délices de la vie, & de l’autre l’attirail du luxe & de la vanité”.

<sup>62</sup> “Dossier thématique François Chomel”, (1678–1756), Archives Municipales de la Ville de Vichy, Vichy (subsequently abbreviated as AMV). “trous boueux”.

<sup>63</sup> Extrait des procès verbaux, (1778), SRM 113, dossier 10, ASRM. “cette manoeuvre a obligé de placer les baignoires si profondément dans la terre quelles présentent en y entrant l’horreur des tombeaux”.

<sup>64</sup> Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM.

be subjected to brawls and other incidents.<sup>65</sup> This meant that mixing military and civilian publics at the springs could be subject to some covert moral complaints.

Most of the moral outrage, however, came from the presence of the poor. A particularly illuminating case can be seen in the complaints made at the town of the Mont d'Or. The local physician Jaulhac denounced the immoral practices that took place at the spa. He described the largest bath as having “no single distinction of sex, or disease, the populace bathes, in a jumble every night until the morning”.<sup>66</sup> This was so common that he used the term “established usage”<sup>67</sup> when referring to the practice. This represented, in his opinion, an affront to both morality and medicine. He then went on to chronicle the constant cacophony and disturbances that emanated from the baths each night.

Behind these scandalised words, the water-taking habits of the poor can be gleaned. A group of people, men and women, took advantage of the mineral baths at night so that they would not have to pay entry fees. Though they would be given the waters for free during the day, the facilities intended for the poor could be truly abysmal. In addition, to receive treatments, the poor sometimes had to provide certificates of their inability to work. It is therefore unsurprising that some of them attempted to bypass these dehumanising systems, and simply entered the baths intended for the regular visitors once operations had ceased for the day.

The late-night spa activities allied self-administered water therapy – the people who visited the baths at night were also sick – and a form of intentional sociability. Those who partook in these night baths intended on continuing to do so. When Jaulhac attempted to have the baths enclosed and guarded, a decision met with approbation by “the honest folk” but which was decried by “the scoundrels”, the door was soon found broken down, and the baths covered in trash, as protest against the new measures.<sup>68</sup> The friction between the paying patients and the poor was to remain part of the reputation of the spas for the entirety of the period.<sup>69</sup>

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<sup>65</sup> Gersende Piernas, “Introduction à l’histoire des hôpitaux thermaux militaires en France (XVIIIe–XIXe siècles),” in *La santé des populations civiles et militaires: Nouvelles approches et nouvelles sources hospitalières, xviiie-xviiiè siècles*, ed. Élisabeth Belmas and Serenella Nonnis-Vigilante (Villeneuve d’Ascq: Presses universitaires du Septentrion, 2010). On the figure of the soldier in the eighteenth century, see: Jean Milot, “Les garnisons dans les petites villes du Nord à la fin de l’Ancien Régime,” *Revue du Nord* 279, 70 (1988); Lionel Dumarche, “La caserne en France au XVIIIe siècle : genèse d’un instrument du pouvoir,” *Revue Historique des Armées*, no. 1 (1984); André Corvisier, *L’armée française de la fin du XVIIe siècle au ministère de Choiseul*, vol. 2, *Le soldat*, (Paris: P.U.F., 1964).

<sup>66</sup> Correspondence from Jaulhac at the Mont d’Or to Lassone, “Plainte sur les abus qui se commettent aux bains du Mont d’Or”, (1788), SRM 90A, dossier 23, ASRM. “sans aucune distinction de sexe, ni de maladie le peuple se baigne, pêle mêle toutes les nuits jusqu’au jour”.

<sup>67</sup> Ibid, “usage établi”.

<sup>68</sup> Ibid, “les honnêtes gens applaudirent a ce changement”. “canaille”.

<sup>69</sup> Similar incidents are described for the first decades of the nineteenth century. See: Correspondence from the inspector Bertrand in Clermont Ferrand, (1808), AJ/16/6697, AN.

The eighteenth-century French spas were a far cry from the luxurious pastoral retreats that they would become during the *Belle-Époque*. This poses important stakes regarding the administration of mineral waters. Regulators were frequently contacted regarding the crumbling state of spa facilities, or incidents that took place between various attendees. The regulators' actions, the points they focused on and the changes they insisted on, can only be understood when accounting for the diversity of mineral water users. The austerity of the Enlightenment spa, as compared to its later incarnations, might also be one of the reasons for its neglect in scholarship.

## An incomplete historiography

My inquiry into the history of mineral waters is set during the eighteenth century, on the eve of the French Revolution, amid the Enlightenment, and within the traditional period associated with the 'chemical revolution'. Because of these intersections, my work relates to a considerable range of established literature. But although this period is a heavily studied time in French history, the question of mineral waters only has a modest presence in historiography. As suggested by the background outlined above, water usage speaks to important themes in the history of medicine, chemistry, as well as institutions, commerce and regulation, making this omission regrettable. I therefore aim to contribute to current scholarship by filling this unexpected gap, and by connecting the broad social world surrounding mineral waters to current understandings of eighteenth-century society.

### *A densely studied modern period*

Mineral waters have been construed as an object of historical significance in plenty of studies, but only rarely in the eighteenth century. Some monographs cover the history of water taking since antiquity, briefly mentioning the early modern period in the process.<sup>70</sup> However, most of the literature on mineral waters concerns the nineteenth and twentieth centuries. Texts focused on the nineteenth century have discussed numerous aspects of thermalism, including the early days of water-tourism, the links between spas and industrialisation, or the forming of social relations in spa towns.<sup>71</sup> These studies are principally

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<sup>70</sup> Thierry Lefebvre and Cécile Raynal, *Du thermalisme à la médecine thermale. Aux sources du vrai « made in france »* (Le Square, 2015).; Jazé-Charvolin, "Les stations thermales : de l'abandon à la renaissance. Une brève histoire du thermalisme en France depuis l'Antiquité."; Dominique Jarassé, ed., *Deux mille ans de thermalisme : économie, patrimoine, rites et pratiques*, vol. 1 (Aurillac: Presses Universitaires de Clermont Ferrand, 1996).

<sup>71</sup> 'Thermalism' (anglicised spelling of the French word 'thermalisme') refers to the practices of using 'thermal waters' for therapeutic purposes. The term is most often used to refer to the spa practices of the nineteenth and twentieth century. Though the word 'thermal' technically means 'warm', thermalism encompasses a wider array of water-healing practices. The word 'thermalisme' is sometimes translated to hydrotherapy, but this translation does not account for the large social and cultural subtext of the original term. I have therefore chosen to use the word

set in Europe and the United States.<sup>72</sup> Scholarship on twentieth century spas typically discusses themes of sociability, cosmopolitanism, and architecture, to name but a few.<sup>73</sup> In addition to these thematic investigations, many modern-era studies focus on a single spa, its history and connections to the wider

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thermalism as a more accurate translation. See: John Scheid et al., eds., *Le Thermalisme, Approches historiques et archéologiques d'un phénomène culturel et médical* (Paris: CNRS Éditions, 2015), 7–11.

On the nineteenth-century practice of thermalism, see: Jeremy Agnew, *Healing waters: a history of Victorian spas* (McFarland & Company, 2019).; Janes M. Adams, *Healing with Water: English Spas and the Water Cure, 1840–1960* (Manchester: Manchester University Press, 2015).; Inmaculada Almahano y Encarnación Postigo, ed., *Turismo y salud: traducción, interpretación y comunicación intercultural en el sector turístico europeo* (Granada: Comares, 2013).; Serge Paquier, *L'eau à Genève et dans la région Rhône-Alpes (XIX–XXe siècles)*, Histoire de l'innovation et entreprise, (l'Harmattan, 2007).; Jérôme Penez, *Histoire du thermalisme en France au XIXe siècle, Eau, médecine et loisirs* (Economica, 2004).; Cossic and Galliou, *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*.; Penez, “Les réseaux d’investissement dans le thermalisme au XIXe siècle en France.”; Arnaud Baubérot, “Chapter III: Les vicissitudes de l’hydrothérapie en France,” in *Histoire du naturisme: Le mythe du retour à la nature*, ed. Arnaud Baubérot (Rennes: Presses universitaires de Rennes, 2004).; Jacques Poisson, “Le voyage aux eaux. Histoire de la desserte ferroviaire des stations thermales,” *Revue d'histoire des chemins de fer* 31 (2004).; Marie-Ange Bugnot, “Le prototourisme médical : le thermalisme sous le Second empire,” in *Patrimoine et traditions du thermalisme*, ed. André Authier and Pierre Duvernois (Toulouse: Privat, 1997).; Authier, Duvernois, and Lefébure, *Patrimoine et traditions du thermalisme*, 1.; Olivier Faure, “Les petites stations thermales en France au xixe siècle : un autre thermalisme ?,” in *2000 ans de thermalisme : économie, patrimoine, rites et pratiques*, ed. Dominique Jarrassé (Clermont Ferrand: Presses Universitaires Blaise-Pascal, 1999).; Dominique Jarrassé, *Les thermes romantiques: bains et villégiatures en France de 1800 à 1850* (Clermont Ferrand: Presses Universitaires Blaise-Pascal, 1999).

<sup>72</sup> Susan Cayleff, *Wash and Be Healed: The Water-Cure Movement and Women's Health, Health, Society, and Policy*, (Temple University Press, 2010).; Loring Bullard, *Healing Waters: Missouri's Historic Mineral Springs and Spas* (Columbia, London: University of Missouri Press, 2004).; Janet Valenza, *Taking the Waters in Texas: Springs, Spas, and Fountains of Youth* (Austin: University of Texas Press, 2000).; Anthony V. Millikan Benedetto and Larry E., “Mineral water and spas in the United States,” *Clin Dermatol* 14, no. 6 (Nov–Dec 1996).

<sup>73</sup> Scheid et al., *Le Thermalisme, Approches historiques et archéologiques d'un phénomène culturel et médical*.; Marie-Eve Férol, “Luxure, calme et volupté dans les villes d’eaux françaises à l’âge d’or du thermalisme (Belle Époque et Années Folles),” *Via Tourism Review* 11–12 (2017).; Carole Carribon, “Villes d’eaux, villes de loisirs. L’exemple des stations thermales françaises de la fin du XIXe siècle aux années trente,” *Histoire urbaine* 41, no. 3 (2014).; George Weisz, “Le thermalisme en France au XXe siècle,” *Med Sci* 18, no. 1 (2002).; D. Cantor, “The contradictions of specialization: rheumatism and the decline of the spa in inter-war Britain,” *Medical history*, n° 10, “The medical history of waters and spas” (1990).

world of thermalism.<sup>74</sup> Historians of science and medicine have also written about the therapeutic practices of water taking in those periods.<sup>75</sup>

There are several current research projects that take spas and their history as a main object of study.<sup>76</sup> The first, titled “The European Spa as a Transnational Public Space and Social Metaphor”, concerns the history of spas, its cultures and its chief institutions in the nineteenth and twentieth centuries.<sup>77</sup> The second, set in France, focuses on the Pyrenees, and on the immaterial culture of thermalism in that region.<sup>78</sup> A third one, titled “The Water Cultures of Italy, 1500–1900”, studies water in general, but includes scientific and medical approaches on early modern water consumption as part of its core research areas.<sup>79</sup>

The modern period has undoubtedly been thoroughly researched when it comes to the history of spas. When the history of thermalism is brought up in media or public history campaigns, it likewise tends to put forward the recent

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<sup>74</sup> Steve Hagimont, “Un essor touristique et thermal contrarié au XIXe siècle : Ax-les-Thermes.,” *Archives ariégeoises* 10 (2018).; Steve Hagimont, “Plaisirs mondains et affections populaires. Le sort des malades indigents dans les stations thermales au XIXe siècle.,” *Revue de Comminges et des Pyrénées centrales, Société des Études du Comminges* 133 (2017).; Thierry Lefebvre and Cécile Raynal, *La source Miraton à Châtel-Guyon* (Nîmes: Lacour-Ollé, 2017).; Marc Prival, *De la source à la fontaine et à la maison : histoire de l'eau potable dans le Puy-de-Dôme* (Editions des monts d'Auvergne, 2012).; Alphonse Chevallier, *Les Eaux de Chaudes-Aigues* (Paris: Res Universis, 1991).; Jérôme Penez, *Dans la fièvre thermale : la Société des eaux minérales de Châtel-Guyon, 1878–1914* (Clermont-Ferrand: Institut d'études du Massif Central, 1994).; Pascal Chambriard, *Aux sources de Vichy, naissance et développement d'un bassin thermal (XIXe-XXe siècles)* (Bleu Autour, 2004).

<sup>75</sup> Adams, *Healing with Water: English Spas and the Water Cure, 1840–1960*.; Hamlin, *A Science of Impurity, water analysis in nineteenth century Britain*.; Jean-Pierre Goubert, “L'eau et l'expertise sanitaire dans la France du XIXe siècle : le rôle de l'Académie de médecine et des congrès internationaux d'hygiène,” *Sciences sociales et santé* 3, no. 2 (1985).

<sup>76</sup> At the time of writing, in 2022.

<sup>77</sup> Led by Christian U. Noack (Seven total participants), “The European Spa as a Transnational Public Space and Social Metaphor (2019–2022)” is part of the HERA (Humanities in the European Research Area) funding initiative of the European Union devoted to the topic Public Spaces: Culture and Integration in Europe. “Within this framework, our project sets out to re-think the spa as a core concept and object of European debate. It investigates how the European spa, with its characteristic institutions such as the Kurpark, sanatorium, grand hotel and casino, developed into a transnational public space and functioned as a stage for the negotiation of political, social and cultural issues of European relevance.” See: Project page online.

<sup>78</sup> This project is led by Nicolas Meynen and managed by Steve Hagimont. Extract from the project description: “TCVPyr, programme de recherche européen (FEDER) pour un inventaire du patrimoine bâti et du patrimoine culturel immatériel de la villégiature et du thermalisme dans le massif pyrénéen français (2017–2020).” “Ce projet a pour objectif de valoriser le patrimoine culturel matériel et immatériel de la villégiature et du thermalisme dans la “zone massif” des Pyrénées françaises.” See: Project page online.

<sup>79</sup> Led by David Gentilcore and funded by the European Research Council, this project “aims to create a new holistic approach to the study of human interactions with water over time.” The project involves ten researchers, and is based at the Ca' Foscari. See" Project page online.

history and cultural patrimony of the spas.<sup>80</sup> This focus is not without reason. Much of the bathing establishments that are still active today gained fame and international recognition in the nineteenth and twentieth centuries. The infrastructure that remains today almost never dates from periods prior to 1800. Industrialisation also transformed the practices of bottling mineral waters, thereby eclipsing previous markets that were bound by the slower manufacturing processes of the early modernity.

*Early modern thermalism in scholarship: a disconnect between general history and history of science*

As highlighted above, the early modern French spas differed significantly from those of neighbouring countries. Though not incommensurably different, the French case thus requires dedicated research in order to highlight its idiosyncrasies.<sup>81</sup> This is also a way in which I believe the scholarship to be missing an important piece. Research has been conducted on the culture of early modern spas, and on the scientific conceptions of mineral waters in European areas, for the likes of Germany, Italy, England, Portugal, Spain, or Sweden.<sup>82</sup> However, France has been partly overlooked.

Eighteenth-century French mineral waters were classed as remedies. Because of this, much of the scholarship that treats the subject tends to stem from an interest in early modern science and medicine. Yet there are exceptions to this. Occasionally, research papers centred on the history of general water consumption have mentioned mineral waters.<sup>83</sup> In other cases, it is the regulation

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<sup>80</sup> Two examples from paper press and radio: Aurélie Luneau, *Aux sources du thermalisme : l'histoire d'une médecine d'avenir ?*, podcast audio, La marche des sciences 2015.; Arnault Chagnon, "Les origines du thermalisme," *L'internaute* 2005.

<sup>81</sup> Though the early modern period has been more neglected by scholarship than the modern period, there are some studies that discuss the place of spas in the French seventeenth century. See: Brockliss, "The Development of the Spa in Seventeenth-Century France."; Jean-Paul Dubé, "L'intérêt d'un médecin de province du XVII<sup>e</sup> siècle pour les eaux minérales et les monstres," *Canadian Bulletin of Medical History* 15, no. 2 (1998).

<sup>82</sup> On Spain: Folch G. Jou and Santamaria M. Aenaiz, *Los analisis de aguas en la Espana de la Ilustracion. Brève estudio analítico-histórico-crítico de la bibliografía española* (Madrid: Universidad Complutense, Facultad de Farmacia, 1983). On Germany: Ute Lotz-Heumann, *The German Spa in the Long Eighteenth Century, A Cultural History* (Routledge, 2021). On Sweden: Elisabeth Mansén, *Ett paradís på jorden: om den svenska kurortskulturen 1680–1880* (Stockholm: Atlantis, 2001). On Italy: David Gentilcore, "From 'Vilest Beverage' to 'Universal Medicine': Drinking Water in Printed Regimens and Health Guides, 1450–1750," *Social History of Medicine* 33. On Portugal: José Pedro Sousa-Dias, "Mineral waters, spas and therapeutics in seventeenth and eighteenth century Portugal," *Portuguese Journal of Social Science* 16 (2017). On England: Noel G. Coley, "Physicians and the chemical analysis of mineral waters in eighteenth-century England," *Medical history* 26 (1982).

<sup>83</sup> Chaplin's article on water drinking integrates mineral waters to a wider system on the promotion of water as a healthy drink. Joyce E. Chaplin, "Why Drink Water? Diet, Materialisms, and British Imperialism," *Osiris* 35 (2020). Other books on the history of drinks rarely mention mineral waters. See for example: Susanne Schmid and Barbara Schmidt-Haberkamp, eds., *Drink in the Eighteenth and Nineteenth Centuries* (Routledge, 2014.); Thomas Edward

and commercial distribution of mineral waters that have attracted scholarly discussion.<sup>84</sup>

Among this thinly spread scholarship, one current research project brings much needed active debate on the history of early modern waters. Spanning from the seventeenth to the nineteenth century, the seminar series *Thermalisme et Politique* (2021) and its subsequent publications have brought different perspectives on mineral waters into focus. It combines perspectives of social history and history of science and medicine, together with the history of arts, literature and music.<sup>85</sup>

Often though, there is an apparent disconnect between the scholarship on mineral waters that originates from general and social history, and the scholarship stemming from the history of science. One particularly interesting paper, which highlights this tendency, is the 1982 article by Pascale Cosma-Muller on the links between the science and commerce of mineral waters in late eighteenth-century France.<sup>86</sup> Cosma-Muller's knowledge of institutional history shines in this article. She describes the motivations of the regulatory agencies, and the ways in which they used scientific discourse to establish authority on the market of mineral waters. These claims match very closely with some of the chapters of the present thesis. However, despite her knowledge of the institutional forces at play, Cosma-Muller was not as familiar with the history of science, which shows in her assessment of the state of mineral water analysis. My intention here is not to point out a flaw in a forty-year-old paper with otherwise rather ground-breaking intuitions. Rather, I believe that it puts emphasis on the necessity of having a solid understanding of eighteenth-century chemistry when studying the mineral water market. If one is not familiar with this history, one can be misled into assuming that chemical analysis originated in the 1770s, and that this early, "qualitative chemistry", with its outdated belief in Phlogiston, was unscientific, and perhaps not even worth a second look.<sup>87</sup> Based on such assumptions, one would miss out on the crucial role that water analysts played in the popularisation of mineral waters.

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Brennan, *Public Drinking and Popular Culture in Eighteenth-Century Paris* (Princeton Legacy Library, 1988).

<sup>84</sup> Alexandre Lunel, "Les premiers médecins du roi, le développement des stations thermales et la réglementation des eaux minérales en France (xvie-xviiiè siècles)," in *Le thermalisme: Approches historiques et archéologiques d'un phénomène culturel et médical*, ed. John Scheid, et al. (Paris: CNRS Éditions, 2015); Olivier Caudron, "Le bureau de distribution des eaux minérales de La Rochelle (1773–1790)," *Écrits d'Ouest* 19 (2011); Yves Oger, *Les bureaux de distribution des eaux minérales aux XVIIe et XVIIIe siècles* (multigr., 1999); A similar contribution concerning British history: Sylvia McIntyre, "The mineral water trade in the eighteenth Century," *The Journal of Transport History* 2, no. 1 (1973).

<sup>85</sup> Séminaire Thermalisme et Politique (XVIIe-XIXe siècle), led by Samuel Cuisinier-Delorme, Sophie Vasset and François Zanetti. (January 15<sup>th</sup>, 2021–June 7<sup>th</sup>, 2021).

<sup>86</sup> Pascale Cosma-Muller, "Entre Science Et Commerce: Les Eaux Minérales En France à La Fin De L'Ancien Régime," *Historical Reflections / Réflexions Historiques* 9, no. 1/2 (1982).

<sup>87</sup> *Ibid*, 250.

Historians of science who have the critical tools to avoid the pitfalls of progressivism have rarely studied mineral waters themselves. Several such works mention mineral waters as an interesting object of scientific study, without adding further detail.<sup>88</sup> Since mineral waters were a natural remedy and not a composite, they were not part of the traditional *Materia Medica*, and have subsequently rarely been studied by historians of pharmacy. More surprisingly though, they have received little attention from historians of medicine.<sup>89</sup>

The history of chemistry is therefore one of the few areas of scholarship that has studied mineral waters.<sup>90</sup> But even within this field, there are some limitations. The scholarship in the history of chemistry tends to focus on the central years of the ‘chemical revolution’, the 1780s and 90s. The mass of literature around those years gives the field a definitive late eighteenth-century inclination. When it comes to French chemistry, this inclination is strengthened by the studies on scientific activity during the French revolution, and the renewal in scientific institutions that it brought about.<sup>91</sup>

The prevalence of literature on both revolutions means that, to an extent, objects of study that share this timeline but had little bearing on the unfolding of either, can fall between the cracks and garner little attention from academic research. I would conjecture that this has been the case for mineral waters. Despite an obvious link to the ‘chemical revolution’, which was in part concerned with the synthesis of water, this subfield of chemistry had little to do with the craft of mineral water analysis.<sup>92</sup>

This brief literature review highlights the difficulties in capturing mineral waters as an object of study. For one, it shows that a substantial fraction of the works on the subject stem from older scholarship and are conducted more in articles than dedicated monographs. In addition, there is a disciplinary division

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<sup>88</sup> Simon gives the example of mineral waters as boundary-crossing objects, placed at the interface between chemistry, medicine and pharmacy. Jonathan Simon, *Chemistry, Pharmacy and Revolution in France, 1777–1809* (Aldershot, Burlington: Ashgate Publishing Company, 2005), 110. Kim also mentions mineral waters as being an important object of study for chemists. Mi Gyung Kim, *Affinity, that Elusive Dream: A Genealogy of the Chemical Revolution* (Boston: MIT Press, 2003), 154–155.

<sup>89</sup> Two notable exceptions are: Joël Coste, “Médecine et thermalisme à l’époque moderne : suivisme des pratiques et plasticité doctrinale dans les recueils de consilia et consultations français (milieu xvii siècle-début xix siècle),” *CNRS Éditions* (2015).; Porter, “The Medical History of Waters and Spas.”

<sup>90</sup> Michael Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750,” *Bulletin of the History of Medicine* 91, no. 2 (2017).; Matthew Eddy, “The Sparkling Nectar of Spas; or, Mineral Water as a Medically Commodifiable Material in the Province, 1770–1805,” in *Materials and expertise in early modern Europe, between market and laboratory*, ed. Ursula Klein and C. Emma Spary (University of Chicago Press, 2010).; Harley, “A sword in a madman’s hand : professional opposition to popular consumption in the waters literature of southern England and the midlands, 1570–1870.”

<sup>91</sup> Jean Luc Chappéy, *Des naturalistes en Révolution. Les procès-verbaux de la Société d’histoire naturelle de Paris (1790–1798)* (Cths Sciences, 2010).

<sup>92</sup> On water and the chemical revolution, see: Hasok Chang, *Is water H2O? Evidence, Realism and Pluralism*, Boston Studies in the Philosophy and History of Science, (Dordrecht: Springer, 2012).

at play. Scholarship outside of the history of science omits crucial medical and chemical factors, which extensively influenced and shaped the market of mineral waters. But historians of medicine and chemistry, when they have studied eighteenth-century mineral waters, have tended to stay very close to the science and have rarely attempted to connect their findings to the economic, political, and social aspects of mineral waters. Finding a way of uniting these perspectives is the novel approach pursued in this thesis.

## Methodology and theoretical approaches

### ‘Enlightening’ as an analytical term

Over the course of my study, I will argue that throughout the eighteenth century, mineral waters became ‘enlightened’, the result of being shaped by three different forces: market, regulation, and science. Each of these forces was embodied by a network of individuals who brought their respective knowledge, interests, and ambitions to mineral waters. The actors who enacted these forces often overlapped, collaborated, and conflicted, further revealing themselves in such interactions.<sup>93</sup> The three forces can be outlined as follows:

-Market. The market of mineral waters became a prevalent income source for a vast network of spa town workers and bottled water distributors. Market actors actively transformed the waters by assigning them a monetary value, placing them in a wide-reaching supply chain, and by increasing the public’s access to water consumption. Through the economic forces of the market, mineral waters were transformed from local resource to commodity.

-Regulation. Embodied at first by the First physician of the king and later by dedicated institutions, successive regulatory bodies attempted to legislate the market of mineral waters. Justified by the public health risk of misusing remedies, legislation claimed to protect the public, particularly the ill and the poor. By centrally establishing rules and enforcement mechanisms, the regulators, through their successes and failures, shaped the definition of mineral waters, and who could have access to them.

-Science. Mineral waters were scientifically examined by a large network of *savants*.<sup>94</sup> This network was predominantly composed of medical

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<sup>93</sup> This division in three analytical angles is comparable to the approach used in Darnton’s examination of eighteenth-century forbidden books, which comprises of a study of their production, market, contents and regulation. The combination of these different angles allows for a crossing of perspectives which avoids the pitfalls of following a single set of actors, allowing him to later comment on broad questions of the period, despite the narrow scope of the initial object. Robert Darnton, *The forbidden best-sellers of pre-revolutionary France* (New York: Norton, 1996).

<sup>94</sup> There can be disagreement regarding the use of the word ‘science’ in an eighteenth-century context. I am opting for its use here for two reasons. First, the scientific activities regarding mineral waters were varied and encompassed multiple fields of knowledge, like chemistry, medicine, physics, and the earth sciences. The term science can therefore account for this

practitioners and chemists, who took great interest in understanding the waters' composition and effects. The prolific enquiries into the history, geology, chemistry, and medicine of mineral waters shifted the conceptions of waters from natural remedy to chemical product, suitable for methods of analysis.<sup>95</sup> The chemical analysis of mineral waters became standardised, to the point that it could be solicited by regulators and market actors to further their own goals.

The result of these intertwining forces is what I have elected to call the enlightening of mineral waters. The *Oxford Languages Dictionary* defines enlightening as: to “give (someone) greater knowledge and understanding about a subject or situation”, or to “give (someone) spiritual knowledge or insight.”, or simply to “shed light on (an object).”<sup>96</sup> This definition is not at odds with my use of the term. Enlightening water in part meant gaining knowledge, insight, and a greater understanding of their effects. But this meaning must be supplemented by the term enlightening as an actor's category.

Throughout the documents used in my study, the word ‘Enlightenment’, or ‘*Lumières*’ is used repeatedly, and its meaning can be sorted into three rough categories.<sup>97</sup> It was often used to compliment a person's intelligence. The analyst Dufau, for instance, praised the collection of “experiments and remarks”, as well as “observations and judicious reflexions” found in a memoir, which together were testimony to the “Lumieres” of their author.<sup>98</sup> Two *savants* used

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diversity. And second, the term was regularly used by actors when referring to their work on the investigation of mineral waters. I will therefore speak throughout this thesis of ‘mineral water science’ and ‘scientific enquiries’. I will however not use the term ‘scientist’, which would indeed be anachronistic. When referring to actors who engaged with scientific investigation, I will use the term *savant*.

<sup>95</sup> The waters went from being viewed as a component of a broader environment to, in some cases, be viewed as a simple chemical remedy. I am however not arguing that this was a process of secularisation. In the early eighteenth century, the majority believed that mineral waters could not work outside of the place in which they sprung, or at least not well, because they would be physically altered by transportation, and because local knowledge on mineral waters was necessary for their use. That being said, by all accounts, the waters were already secularised by the beginning of the eighteenth century, and their effects were largely believed to be entirely within the realm of medicine. For more details on this, see chapter 6.

<sup>96</sup> “Enlighten”, in *Oxford University Press* [online]. (Accessed August 2<sup>nd</sup> 2021). Available at: <https://www.lexico.com/definition/enlighten>.

<sup>97</sup> The term ‘*Les Lumières*’ with a capital L directly translates to ‘The Enlightenment’. The term ‘*lumières*’ was also often used by itself. Applying one's ‘*lumières*’ would translate directly to ‘bringing lights’, which is better expressed by the word ‘enlightening’.

<sup>98</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM. “J'omets Mrs une multitude d'autres expériences et de remarques, d'observations et de réflexions judicieuses contenues au memoire de Mr Dufau qui font honneur à ses Lumieres et dont on ne sauroit trop louer le zele;”. The chemists Venel and Bergman were routinely celebrated for their own ‘lights’, for example in: Joseph Priestley, “Manière d'imprégner l'eau d'air fixe, et de lui communiquer les propriétés de l'eau de Pymont, et de toutes les eaux minérales qui sont connues sous el nom d'acidules ou Aëriennes,” (1772), 10. “C'étois à M. Venel, (dont les talents supérieurs pour la Physique & pour la Chimie, font regretter tous les jours l'espece d'inaction dans laquelle il semble être tombé,) qu'il étoit réservé de porter la lumiere dans cette importante matiere.”; Antoine François de Fourcroy and Jean-Jacques de Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général,” (A Paris,

the term in self-deprecation, lamenting their own lack of lights.<sup>99</sup> The term could also be used ironically. A satirical play written to ridicule a regulatory institution referred to prominent physician Vicq d'Azyr as “a sun of lights”, as a way of mocking the regulators’ disproportionate admiration for their beloved Perpetual Secretary.<sup>100</sup>

Another way to use the term ‘lights’ was to refer to an institution or a group of individuals. In one instance, an analyst referred to the lights of the regulatory institution. On this occasion, his use of the term had little to do with knowledge. Rather, applying lights referred to “the execution of the measures that it must take, to outlaw from the kingdom, the horrid charlatanism”.<sup>101</sup> These lights had more to do with legislation than with knowledge. This example was not isolated. It was a common metaphor to claim to fight obscurantism using the lights of knowledge, and those of the law.

Finally, the metonymy of light was most often used to designate new knowledge in general. The apothecary Machy referred to the extensive and respectable “lights” of medicine.<sup>102</sup> In a similar image, Limbourg described the process by which analysts could add their own “lights” to those of one’s predecessors, which was a sure way of reaching “more extended & more certain knowledge.”<sup>103</sup> The regulators also used the term in their documents, for

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Chez Cuchet, Libraire, rue & hôtel Serpente, 1788), 239. “Bergman, aidé de toutes les lumières de la pratique des expériences, proposa de nouveau l'ancien procédé, d'évaporer les eaux jusqu'à siccité.”

<sup>99</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. “après ces differents procedés ne comptant pas assés sur mes propres Lumieres pour ne pas profiter de celles des autres...”; Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM. “Animé du zèle de correspondre a la tâche que vous m'avez imposé, j'ai surmonté les difficultés inévitables que l'on rencontre en province, lorsqu'on veut s'occuper de la chymie. Obligé de faire venir de la capitale les vaisseaux et les substances, mon travail est devenu plus long et plus pénible. j'ai fait ce que j'ai cru devoir faire, ou plutot j'ai suivi la route que mes foibles lumières m'ont indiqué.”

<sup>100</sup> Achille-François-Thomas Levacher de La Feutrie, “Lassone ou La Séance de la Société Royale de Médecine, Comédie en trois actes et en vers,” (Paris, 1779), 5. “C'est un puits de science, un soleil de lumieres: Oui, Vicq vaut à lui seul dix Facultés entieres.” More on this satirical play can be read in Chapter 3.

<sup>101</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM. “mon zele s'etendra non seulement sur ce qui regarde les eaux minérales, mais encore sur l'execution des mesures qu'elle doit prendre, pour proscrire du royaume, l'affreux charlatanisme : c'est un grand travail sans doute, qu'elle a entrepris, mais je ne la crois pas au dessus de ses lumières et de son credit”.

<sup>102</sup> Jacques François de Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami,” (1756), 43.

<sup>103</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, Discours préliminaire, ii. “en ajoutant aux lumières de ceux qui nous ont précédés les siennes propres, on parvient enfin à des connoissances plus étenduës & plus certaines.” Similarly, the analyst Segray used the image of lights in two ways in the same sentence, first referring to the errors of the ancients which should have “enlightened the modern chemists”, and the resulting “difference in light” that learning from mistakes could make. Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM. “si les chimistes modernes éclairés par les erreurs des anciens ne l'en avaient

example when referring to the creation of a large-scale correspondence network as a “communication of lights”.<sup>104</sup>

The three ways of using the derivatives of the term *Lumières* show that the actor’s category had an inherent complexity. The concept of enlightening was mostly used in a positive way, one that suggested progress, and the overcoming of prior bias – though the example of the play shows that the image of lights could also be used to mock and deride. But even this general optimism was not without nuance. Enlightening could mean bringing new knowledge, but it could also imply an awareness of possible errors. A person’s lights came from education, experience, but also from a willingness to exchange knowledge with others. When applied to institutions and groups, the lights also contained a repressive undertone. The chemists were enlightened, because they rejected obscure and ancient knowledge, just as the regulators used their lights to repress charlatans. Enlightening therefore also meant removing the particular, the local, and putting waters, through a careful and sometimes relentless process of fact-finding, into a clear, transparent system of knowledge, which could yield reliable truths.<sup>105</sup>

The term enlightening has not been chosen in spite of this lack of clear-cut meaning, but rather because of it. For the present purposes, the work of Antoine Lilti on the Enlightenment offers a productive definition. He defines the Enlightenment as an unprecedentedly “polyphonous intellectual movement” and works to highlight its inherent diversity of voices.<sup>106</sup> “We must give up seeing the Enlightenment as a homogeneous intellectual current that put forth

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tirée par des découvertes au dessus de tout éloges qu'elle diffère de travail, qu'elle diffère de lumière ;”.

<sup>104</sup> “Observations sur l’établissement d’une Société de Médecine”, (ca. 1776), SRM 114A–B, dossier 4, ASRM. “communication de lumières”. Later during the revolution, the new regulators noted the need to analyse many mineral springs once again, because of the “new lights acquired in chemistry”. Administration des eaux minérales en période révolutionnaire, (An VII), dossier 332, 2, Archives de la faculté de médecine, Bibliothèque Interuniversitaire de Paris, pôle Pharmacie, Paris (subsequently abbreviated as BIU). “L’École de santé de Paris sera autorisée par le Ministre, à reconnaître avec soin, et d’après les nouvelles lumières acquises en chimie, la nature et les vertus des différentes eaux minérales, d’en recommencer l’analyse, et de les classer d’après leurs propriétés.”

<sup>105</sup> On the uses of scientific methods as tools of domination, see: Caroline Oudin-Bastide, “L’esprit d’ingénieur : pensée calculatoire et éthique économique,” *Revue Française de Socio-Économie* 1, no. 1 (2008).; François Vatin, “L’esprit d’ingénieur : pensée calculatoire et éthique économique,” *Revue Française de Socio-Économie* 1, no. 1 (2008). On broader examinations of links between the Enlightenment and systems of oppression, see: Daniel Carey and Lymm Festa, *The Postcolonial Enlightenment: Eighteenth-Century Colonialism and Postcolonial Theory* (Oxford University Press, 2009).; Damien Tricoire, *Enlightened Colonialism, Civilization Narratives and Imperial Politics in the Age of Reason* (Springer, 2017).

<sup>106</sup> Antoine Lilti, *L’Héritage des Lumières, Ambivalences de la modernité* (Paris: EHESS-Gallimard-Seuil, 2019), 29. “Les Lumières ne sont ni une doctrine philosophique, ni un ensemble cohérent d’idées et de valeurs, ni même un programme réformateur, mais un mouvement intellectuel polyphonique et profondément réflexif, dont les tensions et les failles sont autant d’enjeux qui accompagnent l’entrée dans le monde moderne”.

the programme of modernity”, argues Lilti in a recent article.<sup>107</sup> Within this polyphony of voices, patterns can certainly be discerned, but they should never be framed normatively. Not one set of beliefs, ideas or traits was shared by all who engaged with the Enlightenment.

My study focuses on actors who took part in what can be called the practical Enlightenment, referring to knowledge-producing movements outside of the arts, philosophy or literature.<sup>108</sup> Within these social worlds, a diversity-embracing definition of the Enlightenment is all the more valuable. Enlightening waters was an active process, with differing meanings from one actor to the next. To a water seller, the ideal enlightened water was marketable, free from counterfeit, and appropriately priced. To the physician of the king, enlightened waters were valuable remedies that had been rigorously analysed by trustworthy *savants* and distributed according to current rules. The different social groups representing the market, regulation and science of mineral waters all simultaneously attempted to further the enlightening process.<sup>109</sup> Their differences in ambition resulted in both contradictory and resonating processes, which in turn altered the knowledge and practices of mineral waters.

## Theoretical concepts

In order to interpret the processes that have contributed to the enlightening of mineral waters, I will rely on three key concepts: ‘decentredness’, ‘soft standardisation’ and the ‘esoteric circle’.

I use the term decentredness to describe both the location and physicality of the mineral springs and the scattered network of market actors and *savants* who handled them. Although I make the explicit choice not to speak of waters in terms of agency, I am interested in how the dispersed and flowing nature of the waters challenged power structures.<sup>110</sup> The concept of decentredness

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<sup>107</sup> Antoine Lilti, “In the Shadow of the Public: Enlightenment and the Pitfalls of Modernity,” *International Journal for History, Culture and Modernity* 8, no. 3–4 (2020), 273.

<sup>108</sup> This conceptualisation of a practical Enlightenment has been successfully applied in other studies, notably Paola Bertucci’s use of the “artisanal enlightenment” in her study of eighteenth-century artisan’s and their institutions. Paola Bertucci, *Artisanal Enlightenment, Science and the Mechanical Arts in Old Regime France* (New Haven: Yale University Press, 2017). Additionally, this approach is comparable to the conceptualisation of the Enlightenment in: Hjalmar Fors, *The Limits of Matter: Chemistry, Mining, and Enlightenment* (Chicago: University of Chicago Press, 2015).

<sup>109</sup> This approach is also described in: Lilti, *L’Héritage des Lumières, Ambivalences de la modernité.*, chapitre V, 167–196, 167. “Le découpage en groupes sociaux, définis par un statut juridique ou par une position économique, a laissé la place à une conception plus souple de la société d’Ancien Régime, plus attentive aux pratiques, aux interactions, aux échanges et aux réseaux, aux formes et aux catégories de l’expérience.”

<sup>110</sup> Though highly productive in many research contexts, the frameworks of Actor Network Theory, particularly its later instances which take objects as ‘actants’, are not suitable regarding the present research questions. On ANT, see: Michel Callon, “Éléments pour une sociologie de la traduction, La domestication des coquilles Saint-Jacques et des marins-pêcheurs dans la baie de Saint-Brieuc,” *L’année sociologique* 36, no. 3 (1986).; Bruno Latour, *Reassembling the*

epitomises this view. The term is meant in opposition to the notion of centralisation. Early modern France was a space of constant attempts at increased centralisation, emanating from governmental structures.<sup>111</sup> Mineral waters repeatedly tested this centralising force. The springs often ran against property lines and borders. Attempts at channelling them sometimes led to unforeseen changes in the water's quality. This decentredness extended to the social and scientific worlds working with mineral waters.<sup>112</sup> Though there were centralising institutions within the field, neither the network of water analysts nor the

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*Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); Bruno Latour, *Nous n'avons jamais été modernes, Essai d'anthropologie symétrique* (Paris: La Découverte, 1997). For a more recent discussion of ANT's applications, see: Annemarie Mol, "Actor-Network Theory: sensitive terms and enduring tensions," *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 50 (2010). For a framework outlining human to non-human relations and agency, outside of ANT, see: Philippe Descola, *Par-delà nature et culture* (Paris: Gallimard, 2005).

<sup>111</sup> The centralisation of the French state in the eighteenth century is related, but not entirely synonymous, to the concept of absolutism. The monarchy favoured an increasingly centralised hierarchy of power, which rested on a complex pyramidal network of agents throughout the kingdom who represented the central power in the regions. The concept of centralisation is also highly linked to colonial spaces, and has taken a particular meaning when used in those contexts. Presently, I refer to the concept as describing the enactment of power within the French metropole. On absolutism, see: Jean-Christian Petitfils, "De la monarchie absolue à la monarchie impossible," *Revue Des Deux Mondes* (2016); Arlette Jouanna, *Le pouvoir absolu, Naissance de l'imaginaire politique de la royauté* (Paris: Gallimard, 2013); Roland Mousnier, "Les Concepts d'« ordres » d'« états », de « fidélité » et de « monarchie Absolue » En France de La Fin Du XV<sup>e</sup> Siècle à La Fin Du XVIII<sup>e</sup> Siècle," *Revue Historique des Armées* 247, 502, no. 2 (1972); On centralisation within metropolises: Michel Biard, Jean-Numa Ducange, and Jean-Yves Frégné, *Centralisation et fédéralisme - Les modèles et leur circulation dans l'espace européen francophone, germanophone et italophone* (Rouen: Presses Universitaires de Rouen, 2018); Julian Swann, "'Le roi demande, les états consente': Royal Council, Provincial Estates and Parlements in Eighteenth-Century Burgundy," in *The Eighteenth-Century Composite State*, ed. Hayton D.W., Kelly J., and Bergin J. (London: Palgrave Macmillan, 2010); Eugene White, N., "From privatized to government-administered tax collection: tax farming in eighteenth-century France," *The Economic History Review* 57, no. 4 (2005); David A. Bell, "The 'Public Sphere,' the State, and the World of Law in Eighteenth-Century France," *French Historical Studies* 17, no. 4 (1992); Françoise Hildesheimer, "Centralisation, pouvoir local et diplomatique: les ordonnances des intendants," *Bibliothèque de l'École Des Chartes* 136, no. 1 (1978).

<sup>112</sup> Other studies have taken a similar approach in examining knowledge production in the "province", meaning outside of Paris. See: Mary Jo Nye, *Science in the Provinces: Scientific Communities and Provincial Leadership in France, 1860–1930* (Berkeley, Los Angeles, London: University of California Press, 1986); Daniel Roche, *Le siècle des Lumières en province. Académies et académiciens provinciaux, 1680–1789* (Paris, The Hague: Mouton, 1978). Decentred approaches often discuss the concepts of the vernacular, particularly in medicine. See: Matthew Ramsey, *Professional and Popular Medicine in France, 1770–1830* (Cambridge: Cambridge University Press, 2002). Other studies have highlighted the 'provincial' knowledge production in other fields, such as chemistry. See: Patrice Bret, "The letter, the dictionary and the laboratory: translating chemistry and mineralogy in eighteenth-century France," *Annals of Science* 73, no. 2 (2014); Pierre Labrude, "Les premiers chimistes lorrains. La chimie en Lorraine du XVII<sup>e</sup> au XIX<sup>e</sup> siècles," *Revue d'histoire de la pharmacie* 96, n°361 (2009); Homer E. Le Grand, "Chemistry in a Provincial Context: The Montpellier Société Royale Des Sciences in the Eighteenth Century," *Ambix* 29, no. 2 (1984).

market had a stable centre. These entities were hazy, inconsistently defined and actively resisting centralised power, by exhausting the regulators' resources for problem resolution.

Next, I apply the theoretical notion of soft standardisation. In this case, I draw a parallel with Ken Alder's conception of standardisation in, "Making Things the Same", in which he describes the processes of coercion and cooperation through which eighteenth-century manufacturers reached reliably similar weapon components.<sup>113</sup> My own case is comparable to this process in many ways. Mineral water analysts gradually adopted a standardised method that reflected a compromise between willing scientific exchange and imposed scientific authority. However, because of the unique qualities of each water, and in the face of constant innovation within the field, a firm standard was never fully set, hence, a soft standardisation. The notion of 'softness' will be used elsewhere in the thesis, as a counter to concepts of 'hard' science or knowledge. This softness came from a combination of social intricacies as well as the inherent complexity of the waters.

The final theoretical frame applied throughout my thesis is the concept of the esoteric circle. My use of this concept proceeds from a Fleckian approach to knowledge construction, and on a broader level, the foundational claims of Science Studies (also referred to as STS). The idea underpinning Science Studies is that science does not advance in a straight and predictable line, nor do scientific theories prevail simply because of their inherent superiority to others.<sup>114</sup> This simple principle has been developed into a now relatively mature historiography.<sup>115</sup> It is worth noting however, that these concepts have not

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<sup>113</sup> Alder highlights several points of direct relevance to my study. He discusses the chaotic state of measuring units, pointing out that for the first time in the eighteenth century, the state attempted to remedy the situation (508). In addition, he stresses the effects of what he calls "high mistrust environments" (523), which lead to the creation of gauges and standards. Finally, Alder argues that standards are a product of knowledge, education, morality, and social conflict (537). This model of standardisation is productive to the present case. Ken Alder, "Making Things the Same: Representation, Tolerance and the End of the Ancien Regime in France," *Social Studies of Science* 28, no. 4 (1998).

<sup>114</sup> This simple idea motivated the early works in the field, perhaps most notably in Kuhn's work on paradigm theory, as well as early contributions to the sociology of sciences. See: Thomas Kuhn, *The Structure of Scientific Revolutions* (University of Chicago Press, 1962). Robert K. Merton, *The Sociology of Science: Theoretical and Empirical Investigations* (Chicago: University of Chicago Press, 1973).

<sup>115</sup> For overviews and discussions of the field, see: Ulrike Felt et al., eds., *The Handbook of Science and Technology Studies, Fourth Edition* (Cambridge, London: MIT Press, 2016).; Harry Collins and Trevor J Pinch, *The Golem at Large, What You Should Know about Technology* (Cambridge: Cambridge University Press, 2014).; Peter Dear and Jasanoff Sheila, "Dismantling Boundaries in Science and Technology Studies," *Isis* 101, no. 4 (2010).; Nancy D. Campbell, "Reconstructing Science and Technology Studies: Views from Feminist Standpoint Theory," *Frontiers: A Journal of Women Studies* 30, no. 1 (2009).; Lorraine Daston, "Science Studies and the History of Science," *Critical Inquiry* 35, no. 4 (2009).; S. Cozzens and T. Gieryn, eds., *Theories of Science in Society* (Bloomington: Indiana University Press, 1990).; Trevor J Pinch and Wiebe E. Bijker, "The social construction of facts and artefacts: or

always transferred well onto other fields.<sup>116</sup> Though my thesis does not attempt to reinvent Science Studies scholarship, I want to put forward a few of the field's principles that will be applied here. In addition to the non-linearity of the evolution of science, I have embraced the model of the social construction of knowledge.<sup>117</sup> I have chosen however to distance my approach from Science Studies' emphasis on controversy. I support the fundamental idea that friction is an effective way of uncovering social dynamics. But my case, though it includes a fair share of controversial moments, cannot be fully encompassed by a sole focus on conflict.

Plenty of scholars have participated to the field of Science Studies, and among their contributions, I find an intuitive and productive simplicity to Fleckian vocabulary, hence my choice of concept, the esoteric circle.<sup>118</sup> An esoteric circle, according to Fleck, is a group of actors in the sciences who share a language and a "thought style".<sup>119</sup> Because of this shared vernacular, they are able to work autonomously from other fields of knowledge, and participating to the research questions of the field necessitate an adoption of the thought style. That which is outside of the esoteric circle is referred to as exoteric circle. Knowledge, according to Fleck, is constructed in interactions and constant negotiations between the esoteric and exoteric circles. My study adopts this principle.

## Methodology

Any investigation over a large geographical area, particularly when it also spans across a lengthy period, requires a special kind of methodology. In this case, the study design presents two risks. On one hand, a study of every spa town of the eighteenth century would potentially drown any potential conclusions in the detail and specificities of each location. On the other hand, centring only on the broad strokes would ignore the inherent diversity of the subject matter, thereby risking inaccuracies. The method which I have selected

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how the sociology of science and the sociology of technology might benefit each other," *Social Studies of Science* 14, no. 3 (1984).

<sup>116</sup> See the above-cited example of Cosma-Muller's article: Cosma-Muller, "Entre Science Et Commerce: Les Eaux Minérales En France à La Fin De L'Ancien Régime." This is also discussed by Alder in: Alder, "Making Things the Same: Representation, Tolerance and the End of the Ancien Regime in France."

<sup>117</sup> For an outline of the methods of the construction of knowledge, see: Michael Lynch, "Social Constructivism in Science and Technology Studies," *Human Studies* 39, no. 1 (2016).; Arnold Thackray, ed., *Constructing Knowledge in the History of Science*, vol. 10, Osiris (Chicago: The University of Chicago Press, 1995).; Isabelle Stengers, *L'invention des sciences modernes* (Flammarion, 1995).

<sup>118</sup> Ludwik Fleck, *Genèse et développement d'un fait scientifique*, trans. Nathalie Jas (Paris: Champs Sciences, 2008), 184, 196, 204, 210.

<sup>119</sup> Ibid, 22. On the Fleckian "thought style" or *Denkstil*, see: B. E. Babich, "From Fleck's 'Denkstil' to Kuhn's Paradigm: Conceptual Schemes and Incommensurability," *International Studies in the Philosophy of Science* 29, no. 1 (2003).

has been aimed at limiting these two extreme cases, by conserving the richness of the study object while nevertheless finding ways of identifying patterns.

In order to obtain quantitative information regarding early modern mineral waters, I have elected to create a dedicated database. My thesis relies heavily on primary source material, which is both diverse and extensive in volume. This large assortment of texts is linked by three prevailing characteristics: the documents are written in French, they originate from the long eighteenth century, and they pertain, in some capacity, to mineral waters. Despite its diversity, this material does present one repeated type of document: the water analysis report. Although not identical in structure or contents, these reports follow a loose pattern, which I have been able to categorise and insert into a database.<sup>120</sup> I will briefly outline some of the intentions behind the database's design, its main function, as well as some of its limitations.

The database contains ninety-three entries, each corresponding to a single water analysis. For example, entry n°36 concerns the analysis of the waters of Vals by the physician Laprade, who wrote his report in ca. 1775. The reports range from a single page to dozens and at times hundreds of pages of text. When a single text describes several analyses, they have been split into different entries. In all, the reports concern seventy-two different springs, mostly situated in France, although a few of the waters in question are in neighbouring countries. The reports span from 1718 to 1809.<sup>121</sup> Sixty-nine entries come from manuscript sources, the remaining twenty-four are printed works.<sup>122</sup>

The primary aim of the database is to provide an understanding of the evolution of chemical analysis, as well as some background information on the analysts themselves and their motivation. The database therefore addresses both the context of the reports and their contents. An important feature of the database is that it presents an image of what chemical analysis looked like in practice, by purposefully not considering factors such as fame, influence, or notoriety of the included authors. While some reports were written by widely influential authors, others have likely been read only by those who were directly concerned with the analysis' results.

A common difficulty of databasing endeavours is to evaluate their representativeness.<sup>123</sup> This question is of course difficult to answer. With a sample of under one hundred analyses, some statistical aberrations are bound to happen. Unfortunately, analysis reports simply do not exist in the kind of numbers needed to reach a higher level of statistical significance. I have scoured inventories for potential entries and included every water analysis I came across,

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<sup>120</sup> I have created this database using the software Airtable.

<sup>121</sup> The corpus does include one analysis made in 1671, but it is not representative of the rest of the date range.

<sup>122</sup> See bibliography section.

<sup>123</sup> To the typical methodological disclaimers that come with quantitative approaches of the early modern period, I must add that since I designed the database and made the entries by myself, with no third-party checks. Some errors can and likely have entered the base, despite my best efforts.

but many printed works have likely escaped my notice, as I have primarily focused on searching for manuscript documents. In addition, most of the analyses that I encountered were sent to scientific institutions or recounted by fellow analysts, meaning that their authors had to have some connection to a broader network of *savants*.<sup>124</sup> Finally, it should be said that plenty of reports might simply have been lost to time, as is the case with all archive-based research.

An inherent issue of quantitative work is that it can amplify patterns, as it is in its nature to show repetition. Although I believe that the standardisation of water analysis is strongly supported, a database is likely to bring about such a conclusion. In order to lessen the effects of circular proof, I have designed the database to do as little interpretative work as possible and have subsequently remained flexible regarding data-entry, adding categories whenever necessary.<sup>125</sup>

Despite some limitations, I argue that given the number of entries, strong claims can be made regarding the general method of analysis, especially concerning the latter half of the period. But when it comes to the first half of the eighteenth century, the conclusions are more likely to evolve and be amended with further research.

In order to complement the findings from the database, I have also utilised an archival methodology which highlights the local and the unique characteristics of individual situations. Much of this methodology has to do with the choice of archival material, which will be outlined in the following section. I have however used one main methodological model in investigating these archives. This model comes from Arlette Farge's *Vivre dans la rue à Paris au XVIII<sup>e</sup> siècle*.<sup>126</sup> Farge's book is intensely focused on primary material, which consists in an extensive collection of documents edited into themes, which

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<sup>124</sup> Given the difficulty associated with performing a chemical analysis, I find it unlikely that there were a myriad of truly isolated analysts. That being said, if some *savants* analysed waters and never communicated their results with either colleagues or scientific institutions, they have been omitted from my quantitative study.

<sup>125</sup> Eighteen categories have been included in the design of the database. They are: *Name of the spring*, the last *Name of the author(s)*, their *Disciplinary affiliation* (principally medicine, chemistry, pharmacy or surgery), the *Date*, or best estimate of when the analysis was conducted. The following seven categories concern steps of the analysis designed as Boolean values. These steps are: *Description of the environment*, *Physical measurements* (i.e.: temperature or weight measurements), *Sensory analysis*, *Reagents analysis*, *Dry analysis*, *Air analysis*, and finally, a category which turned out to be almost never necessary, *Synthesis*. Following these yes/no entries, a category was added to list the *Sensory vocabulary* used. This category was further processed in later stages, in order to obtain a complete list of each word used as well as a count for each of them. The next category is a secondary table of all the *Reagents* used, allowing for the retrieval of a list of the reagents mentioned. The next column, *Dry analysis*, was also processed into more subcategories after the entry. Likewise, the *Stated reasons* have also been processed using finer divisions after data-entry. The final two categories indicate *Additional research* included in the text, and the *Archival reference* of the report.

<sup>126</sup> The title translates to "Living on the streets in eighteenth-century Paris". Arlette Farge, *Vivre dans la rue à Paris au XVIII<sup>e</sup> siècle* (Paris: Gallimard, 1992).

together highlight the life of the Parisian poor, beyond elite-centred accounts of poverty. Farge's work demonstrates a particular attention to the shaping of social relations by power structures, but does so from a multitude of personal accounts, effectively writing history from below.<sup>127</sup> This approach has also been utilised in my own work. Whenever possible, I have highlighted themes and patterns stemming directly from the archival documents, rather than established narratives. Likewise, Farge's attention to human stories, personal opinions and individual oddities is echoed in my own work.

## Primary material and thesis outline

### Archival material

Given the relative historiographical sparsity on early modern mineral waters, my work relies heavily on primary source material.<sup>128</sup> There are, broadly speaking, two possible archive strategies for thematic research of this kind. The focus can be placed on a particular spa town, its records and history, to exemplify wider trends in the practices surrounding mineral waters. The alternative possibility is to find an institution that gathered material from a large variety of actors spread over various locations. I have elected to use the latter method, while keeping elements of the former as a way of dispersing the overly centralised narrative often present in regulating institutions.

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<sup>127</sup> The term "histoire d'en bas" (history from below) was originally coined by Febvre, and further developed and redefined by later scholarship. See: Lucien Febvre, "Albert Mathiez : un tempérament, une éducation," *Annales* 18 (1932).; Edward P. Thompson, "History from Below," *Times Literary Supplement* 3345 (1966).; Edward P. Thompson, *The Making of the English Working Class* (London: Penguin, 2013).; Carlo Ginzburg, *The Cheese and the Worms, the Cosmos of a Sixteenth-century Miller* [Il formaggio e i vermi: Il cosmo di un mugnaio del '500], trans. Anne C. Tedeschi and John Tedeschi (Baltimore: The Johns Hopkins University Press, 2013). This scholarship, as utilised by Farge, has also been enriched by sociological perspectives, as well as Foucauldian approaches. See: Pierre Bourdieu, *Méditations pascaliennes* (Paris: Seuil, 2003).; Michel Foucault, *Histoire de la folie à l'âge classique* (Saint Amand: Gallimard, 1995).; Arlette Farge and Michel Foucault, *Le désordre des familles* (Gallimard, 2014).

<sup>128</sup> With rare exceptions, the primary material used throughout the thesis was originally written in French, making translations an important point to address. All translations from French to English have been made by me. I have, on rare occasions, altered punctuation when it significantly hindered comprehension by adding or removing a comma. Otherwise, I strove to keep the translation as close to the original French as possible. I replicated the use of capital letters and ampersands. Typically, eighteenth-century French had terms like 'King' or 'France' capitalised. When I have left such words uncapitalised, it was to match the original document. I have also kept stricken through words in the quoted passages (i.e.: "she ~~have~~ held"). I have also kept the individuals and place names as they were spelled in the original document (i.e: some documents spelled La Mothe as Lamothe, or Arnaud as Arnault). I have however not reproduced spelling errors. I have also kept the shortened name of the Société de Médecine *Société* in the original French, since I use that name throughout the thesis in untranslated French too.

Consequently, the documents gathered from the Société Royale de Médecine are at the forefront of my investigation. The *Société* (or SRM as it is sometimes referred to in the literature), was the medical institution in charge of administrating mineral waters between 1776 and 1793. It kept orderly records of its activities, including the minutes of its meetings and the bulk of its correspondence. It also held the archives of its short-lived predecessor, the Commission Royale de Médecine, or *Commission*. After the termination of the *Société*, all records were left in the possession of its former secretary Vicq d’Azyr. They were eventually passed on to the Académie de Médecine upon its creation in 1820.<sup>129</sup> To this day, the Academy still holds those documents, according to their original classification. These records provide a comprehensive access to the intent of both *Commission* and *Société*, their laws and daily decisions, as well as accounts of their interactions with the network of market actors throughout the kingdom.

Within the archives of the *Société*, I have selected all documents related to its creation for special attention, as well as legislative drafts and accounts of conflicts with other institutions. I then gathered all documents related to chemical analysis, in addition to a large selection of letters documenting the exchanges between the *Société* and various spa towns and other market actors.<sup>130</sup>

In order to contextualise some of the events surrounding the creation of the *Société*, I have consulted the manuscripts available at the Library of Pharmacy at the Université Paris Descartes.<sup>131</sup> These manuscripts originate from the Faculty of Medicine of Paris and provide a different account of the events related by the *Société*, partly due to the conflict between the two institutions. The Faculty’s archives provide additional information on other parts of this study, as the Faculty authored several scientific texts on mineral waters.

Because of the *Société*’s abrupt revolutionary demise, I have decided to seek material on the administration of mineral waters during the French Revolution and early empire to discern whether dynamics present at the *Société* endured as political regimes shifted. Documents on these later periods all

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<sup>129</sup> The Academy of Medicine is located in Paris, and has not ceased operation since its 1820 creation. It is a separate institution from the Académie des Sciences. George Weisz, *The medical Mandarins. The French Academy of Medicine in the nineteenth and early twentieth century* (Oxford: Oxford University Press, 1995).; Rafael Mandressi, “Félix Vicq d’Azyr: l’anatomie, l’État, la médecine,” *Bibliothèque Interuniversitaire de Médecine* (2005).

<sup>130</sup> The series SRM 88–204 holds all archives from the Société Royale de Médecine (ASRM). A large portion of these documents were opened during research for the present thesis, but the main series of use were the section SRM 88–95 concerning the mineral waters, as well as the documents emanating from the Commission pour l’examen des eaux minérales et des remèdes particuliers (SRM 111–113 and SRM 115A), which were transferred to the *Société* upon its creation. I have also investigated all documents concerning the elaboration of the *Société* itself, as well as its legislation drafts (SRM 114A–B). For a full overview of references, see the bibliography section, Archival Collections.

<sup>131</sup> The documents used from the Bibliothèque Interuniversitaire de Paris (BIU), pôle Pharmacie, were not thematically organised. I consulted manuscripts coming from multiple parts of the Fond Ancien, including specific folders as well as the registers of the Faculty.

originate from the French National Archives. The section AJ/16, which broadly concerns matters of medicine, remedies and the medical profession, contains archives related to mineral waters. The section F/14/1309, coming from the *École des Ponts et Chaussées*, also contains a section on waters which has been utilised here. Finally, two other series from the pre-revolutionary period have been consulted at the National Archives. First are the documents from the Paris notary archives (MC/ET), which contain various leases, certificates, and other administrative documents. The second is the large volume of documents from the O series, of the *Maison du Roi*. This series contains microfilm versions of all legal documents produced by the monarchy, such as the Letters patent that I have used throughout the thesis.

To offset the Parisian nature of this archival corpus, I have sought out documents in regional and municipal archives.<sup>132</sup> The most important source of documents of this nature came from the *Académie des Sciences, Belles Lettres, et Arts* in Lyon.<sup>133</sup> These documents provide a realistic indication of how much work was dedicated to chemistry and mineral waters in a less specialised institution. They also provide a closer look at the map of mineral waters on a regional level, from the perspective of a town that did not have its own mineral spring. In the city of Lyon, I have also consulted the municipal archives to obtain records on the administration of the waters by the city hall.

To get a similarly local lens but from the perspective of a spa town, I have searched for material at the Municipal Archives of Vichy.<sup>134</sup> These documents span across the whole eighteenth century, thus painting a richer picture of spa town activity during the Enlightenment.

Finally, I have supplemented the above-mentioned documents – largely manuscripts – with a significant number of books and treatises on mineral waters that were put to press during the eighteenth century. Some of these printed works were consulted at the Othmer Library of the Science History Institute in Philadelphia.<sup>135</sup> Many prints are also available at the Hagströmer library in Stockholm. In addition to these physical locations, many early modern sources are available online, and I have therefore been able to include an

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<sup>132</sup> For this purpose, I have attempted to search the regional archives of the Haute Loire to find traces of the bureau of distribution of mineral waters that existed there, but to no avail. These bureaux unfortunately appear to have left few traces in municipal and regional archives.

<sup>133</sup> These archives naturally do not have a dedicated section on mineral waters, so I instead opened in priority the documents related to the physicians and chemists who worked with waters, namely Laprade, Lanoix, Gavinet, Willermoz and Tourette. Some of the archives of the Academy, particularly the minutes of its meetings, are for inscrutable reasons located at the *Bibliothèque Municipale de Lyon* in the *Fond Ancien*.

<sup>134</sup> In this case, the documents I used were primarily administrative in nature, related to the town's administration of the waters as well as documents related to the action of the *intendants* (see: HH1, HH2, BB6, II1, and files on Fouet, Chomel and Giraud).

<sup>135</sup> The Donald F. and Mildred Topp Othmer Library of the Science History Institute in Philadelphia houses a large collection of historical printed works on chemistry. The Institute keeps roughly one hundred printed books concerning mineral waters between 1670 and 1800, in France and England. Many printed works cited throughout the thesis were consulted there.

abundance of prints from online repositories such as Gallica and Google Books.<sup>136</sup>

## Chapter list

The thesis is subdivided into eleven chapters, each addressing a set of interactions around mineral waters involving different groups of actors. The contents of each chapter can be summarised in the following outline.

Chapter two explores the market of mineral waters. It first details how this commerce shaped the spa town of Vichy, before taking a higher vantage point, studying the circulation of waters throughout the French kingdom. It then provides an estimation of the size and logistical characteristics of the market of bottled waters, ending with a study of price evolutions towards the end of the century.

Chapter three centres on regulatory institutions, namely the First physician, the Commission Royale de Médecine and the Société de médecine. The chapter recounts the history of these successive regulatory bodies, their ambitions, and controversies. It takes particular care in detailing the lengthy conflict between the *Société* and the Paris Faculty of medicine. It then explores the rules that these institutes attempted to impose on the market of mineral waters, and the driving principles underpinning their legislative efforts.

Chapter four builds on the previous chapter, by taking a central aspect of the regulatory efforts, namely the establishment of chemistry as the expert science on mineral waters, and recounts how this principle affected the world of mineral waters throughout the century. It begins with an exploration of chemistry in the early eighteenth century, and a survey of the plans of wide-scale chemical analysis mandated by the state over the years. It then highlights the place of chemistry in regulatory institutions and showcases the practical ways in which a ‘chemical standard’ was enacted onto the market by the *Société*.

Chapter five switches perspective from the regulators to the waters themselves, describing the ways in which early mineral waters resisted and challenged the legal systems outlined beforehand. It emphasises how the Parisian regulators could not be as unified as initially promised, and how regional idiosyncrasies and resistance to centralisation meant that mineral waters remained a decentred commodity throughout the century. The chapter ends with an exploration of the revolutionary period and shows the effects of the end of centralised monarchy on the administration of mineral waters.

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<sup>136</sup> The list of historical sources used here is admittedly very paper-based. Since most spa towns of the eighteenth century have either fallen out of use or, on the contrary, become hugely popular in later periods, there remains little of the eighteenth-century spa facilities. The same can be said of the materiality of the commerce of mineral waters. Very few bottles, stamps or seals from the time have survived, at least for the French case, meaning that the bulk of the present work is based on textual interpretations.

Chapter six changes perspectives once more, by taking the point of view of the mineral water analysts. It begins with a prosopographical sketch of their backgrounds and affiliations. The chapter then examines the stated reasons which drove them to perform water analyses, before presenting a picture of the analysts' network, the people they worked with and the references they cited. It finishes by providing an initial glimpse into the contents of their reports, highlighting the complementarity of chemical and medical discourse in their writings.

Chapter seven delves into a specific aspect of the analytical work on mineral waters: the sensory analysis. It begins by showing the lasting importance of the senses in the difficult task of defining mineral waters. It then presents a historiographical debate regarding the place of the sensory in chemistry, and refutes the alleged poverty of the language used to describe the senses by closely investigating the lexical field of the sensory, namely sight, taste, smell and touch, in chemical analysis.

Chapter eight looks at the remaining steps of the analytical endeavour. It first discusses the difficulties in performing chemical analysis on mineral waters, before examining each individual step of the procedure as it was conducted in the eighteenth century. The chapter provides special depth on the role of the reagents and the variants on dry analysis. It concludes by describing the rising importance of quantitative methods towards the end of the century, and by discussing the standardisation of the analytical procedure.

Chapter nine rests on the findings of all previous chapters and highlights the consequences of the enlightening process of mineral waters. It starts by discussing scepticisms regarding the analytical method, and explores the hypothesis stating that such doubts came from a disconnect between the effects and the composition of mineral waters. The chapter then follows the consequences of this scepticism, as it split the consumption of mineral waters into two distinctive branches. First, the 'rational' branch is explored, characterised by an embracing of artificial mineral waters. The second branch, explored thereafter, embraced the shortcomings of analysis, and was embodied by the continued debate regarding the possibility that mineral waters might be universal panaceas.

Chapter ten, the epilogue, briefly outlines later developments of the dynamics studied in the thesis. Based entirely in historiography rather than empirical material, it primarily centres on the place of mineral waters in the pharmacopeia during the nineteenth, twentieth and twenty-first centuries. The epilogue tentatively presents the waters in a pendular movement between the worlds of orthodox and alternative medicine throughout the modern period, an uncertainty of classification that endures to the present day.

The thesis concludes with a summary of its main findings. It categorises them in two sections, beginning with the conclusions that propose a reevaluation of the longer history of thermalism. The second and final section connects the findings of the thesis to broader themes of historiography, and shows ways

in which my study mirrors, reinforces and challenges select narratives of Enlightenment-era knowledge and societies.

## Chapter 2. The mineral water market

For centuries, it had been accepted that in order to use mineral waters, traveling to the spring was necessary. While this practice never disappeared and in fact endures to the present day, an alternative form of water taking grew significantly in popularity during the eighteenth century: the consumption of bottled mineral waters. This new practice dramatically expanded the overall economy of waters. Instead of a resource that could only be found in distinct localities, mineral waters had instead become a widely available commodity. This availability implied the existence of robust logistics, a complex pricing grid, and a system that patients trusted.

The economics of eighteenth-century mineral waters provide the stakes for any discussion of the scientific and legislative apparatus which was deployed over the market. The presence of transported waters throughout the French Kingdom was systematically raised as a reason for closer regulation. At the same time, the water sellers depended on the legitimacy they gained from regulators and scientific appraisals of their waters. Understanding the market dynamic is therefore crucial for understanding the early modern history of mineral waters, which is why the market will be at the centre of attention in this chapter.

The commodification of mineral waters should be viewed in the light of wider trends regarding the commercialisation of eighteenth-century societies.<sup>137</sup> The waters were not the only medical product to undergo this kind of transformation. The market of remedies was generally growing more complex, particularly with the influx of ingredients from the colonies.<sup>138</sup> But while this overall trend towards larger and more far-reaching markets is helpful in understanding the rising interest of the state in regulating these systems, it fails to explain the pressures that acted upon local actors. Understanding what went into the price of a bottle, why some springs became more popular than others, or the logistics of transport – all these phenomena require a finer comb.

In this chapter, I will approach the market of mineral waters from two different viewpoints. The first, a local perspective, highlights the influence of in-

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<sup>137</sup> See: Amalia D. Kessler, *A Revolution in Commerce, The parisian merchant court and the rise of commercial society in eighteenth-century France* (New Haven, London: Yale University Press, 2007).

<sup>138</sup> Olivier Lafont, “L’introduction du Quinquina dans la médecine Européenne : un choc culturel au XVIIe siècle,” in *Materia Medica, Savoirs et Usages des Médicaments aux Époques Médiévales et Modernes*, ed. Philip Rieder and François Zanetti (Genève: Librairie Droz, 2018).

person relations and individual struggles.<sup>139</sup> Despite the expanding size of the market, its scale still allowed for local issues to be directly brought to regulators. These issues in turn influenced the elaboration of legislation. The second perspective, a country-wide scale, follows the movement of the bottles throughout the French kingdom, and gives a sense of the extensive reach of the market, while providing important data on the kinds of waters that were transported, the roads they travelled, and their final destinations.

The first instances of water transportation arose from a practical issue. In the opinion of most early modern medical professionals, mineral waters were best consumed right after they emerged from the earth, under the supervision of a competent, local physician, who would be well-acquainted with their effects. But since the French waters were only taken by people who were sick, some patients were bound to be too ill to travel. Even for those who could afford to charter a carriage for eight days of one-way travel to a spring, their condition was sometimes too dire to take the rattling of the road. Carrying the waters directly to the bed of those patients was therefore seen as an acceptable compromise.

After some time, more and more patients took interest in the convenience of transported waters. An important argument in defence of the bottles was that albeit expensive, they were considerably cheaper than a lengthy stay at a spring. For spa town owners, this created an incentive to facilitate the bottling of their waters towards this newly formed demographic. The physicians who were in charge of evaluating the safety of these practices came to the conclusion that mineral waters in bottles were still better than no remedy at all. The market was thus enabled by the physicians' approval, first in a few select towns, but expanding decade by decade until, by the late eighteenth century, almost all moderately populated towns could boast their own bureau of distribution of mineral waters.

I will begin this exploration of the mineral water market with a case study focused on the spa town of Vichy. The history, organisation and struggles of the town to live from its mineral waters establish local stakes for the wider market of waters. I will then widen the scope to examine the network of bottled waters in the larger French kingdom, presenting a map of the origins of transported waters for the period. This will provide an estimate of the overall size of the market and give valuable information on the modes of transportation. This data will then be used to confront the complex question of prices. I will argue that transportation was the principal bottleneck in the pricing of mineral waters throughout the Enlightenment period.

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<sup>139</sup> While situating the market of French mineral waters in the context of an emerging trade of remedies at a wider scale (European or even global) would be a highly valuable contribution to current scholarship, no comparative study can be conducted before a baseline on the operation of the French mineral water market is established.

## Vichy: a town dependent on its waters

Before looking at the market of mineral waters from a vantage point encompassing a larger view of the French kingdom, it is important to first understand its stakes at the local level. Most mineral waters were referred to by the name of the town they originated from. At any given vendor, there could be a large range of waters on offer, sometimes amounting to dozens of different kinds. Because of this, it can be easy to forget that behind each of these names, there was a town, and often a community which lived in part from the profit that it made selling their waters. In order to ground the economic analysis of this chapter, I want to first describe the township of Vichy, and how it was shaped by the commerce of its famous mineral waters during the eighteenth century.

Vichy never was a large town. It was first created as a Roman settlement during the first century AD, and it continued existing throughout the medieval period as a village. By the eighteenth century, the town still had a limited number of full-time residents: according to the census of 1758, Vichy counted a total of 180 “feux” (literally “fires”, here meaning “homes”), many of them occupied by widows.<sup>140</sup> Despite its limited size, however, ever since its foundation the history of Vichy had been deeply entangled with that of its waters. Its Roman name, *Aquae Calidae*, translated simply to “Hot waters”. Vichy’s involvement with mineral waters defined the town for much of its history.<sup>141</sup> In the late nineteenth century, Vichy became known as a high society mountain getaway, frequented by the cosmopolitan crowd of the *Belle Époque* spas. As discussed in the introduction, no such luxury existed anywhere in France in the eighteenth century, and Vichy was no exception. The spa-related accommodations were basic, and the administration of the waters certainly did not bring the city fortunes. Despite this, by the 1770s, the Vichy bottles were already an expected staple in any well-stocked bureau of distribution of mineral waters. Early modern Vichy was already and decidedly a spa town.

The inhabitants of Vichy were aware of their dependence on the mineral springs of their town. They sent a letter in the later decades of the eighteenth century to the Chancellor of France, lamenting the closure of their Thursday market. Though it had once brought much activity to the town, a raise in import taxes in the region had forced the sellers to abandon it. The letter used a

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<sup>140</sup> Délibération des habitants, État et réparations à faire aux bains, (1758), Série HH2, AMV.

<sup>141</sup> The town of Vichy today is mostly known for having been the capital of the nazi-collaborating government of France during the second world war (often called the “Vichy Regime”). Notably, the choice of Vichy to become the temporary capital was not completely unrelated to its history as a spa town. In the nineteenth and early twentieth centuries, Vichy was a famous and luxurious spa resort with the capacity to host large seasonal crowds. These facilities were what made the relocation of the French government possible. At the time of writing, the city is part of a shared UNESCO application called “Great Spas of Europe” that hopes to bring visibility to the history of thermalism. Interestingly, in Sweden, the term “Vichyvatten” (Vichy-water), has become shorthand to designate certain types of carbonated waters, much like the waters of Spa have also become the short-hand term for all water treatments and towns specialising in thermalism.

notable argument in order to make its point, stating: “this desertion has so markedly harmed the town of Vichy, that without the mineral waters which it enjoys, it would be entirely depopulated”.<sup>142</sup> Though this was clearly a rhetorical device, the fact that the locals were willing to claim that the waters were the sole thread that held the town together makes the town a worthy case for understanding the period’s market of mineral waters.

The waters of Vichy were sold in major cities including Paris and Lyon, as well as in plenty of smaller towns. The city also attracted a large crowd of patients looking for a cure on site. A hospital had to be built in order to house the poor who came to Vichy for treatment. So while the city was not rich, the liquidities brought in by the mineral water trade, both via the spa and the bottling business, were enough to be its prime source of revenue. This makes Vichy’s situation representative of other French spas, the likes of Bourbon-Larchambault, Balaruc, Bagnères, Vals, or even the Mont d’Or for the end of the investigated period, which were all townships of similar size and revenue bracket. All being small communities, none of them could afford luxurious installations. They nevertheless had the reputation and the endurance to be viewed as the household names of the French mineral water trade. In turn, this brought them a modest but relatively steady income.

### *The water season*

A peculiarity of the practices of mineral water cures was their seasonality. Travelling to a spa town could be a lengthy journey. Paris and Vichy are 314 kilometres apart in a straight line. When including the bends in the roads, particularly when approaching Vichy, which was nestled in the volcanic mountains of the Massif Central, the entire trip would take days. When Madame de Sévigné travelled from Paris to Vichy in 1676, it took her eight days to reach her destination.<sup>143</sup> Such a trip could hardly be undertaken during the winter, or even in the late autumn. The cold, the poor state of the roads, and the potential risk of snow and ice meant that no one visited spa towns in the winter. Inclement weather conditions were also dangerous for the transport of the waters themselves. If a carriage bearing a fortune’s worth of water were to encounter a frost during the night, the bottles would all be at risk of breaking from the ice. The bottled water commerce consequently had to obey the rhythms of seasonal transport.

The habit of using waters in the warmer months was more or less universally established across all spa towns. The water season lasted between the end of the spring to the mid-autumn. A 1718 report described it as lasting from the Feast of Saint John the Baptist (June 24<sup>th</sup>) until the middle of September.<sup>144</sup>

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<sup>142</sup> Rétablissement du marché, (XVIII<sup>e</sup> siècle), Série HH1, n°72, AMV. “cette desertion a fait un tord si marqué a la ville de Vichy, que sans les eaux minerales dont elle jouit elle seroit entierelement depeulée.”

<sup>143</sup> Brockliss, “The Development of the Spa in Seventeenth-Century France.”, 26.

<sup>144</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

The author explained that if the situation absolutely required it, the waters could be taken out of the season, but in that case, they would need to be lightly warmed before consumption. Later in the eighteenth century, the dates expanded slightly on both ends of the season. The first of May became the well accepted date of the beginning of the water season, and the beginning of November marked its end.<sup>145</sup>

These dates put some restrictions on the profitability of selling waters. All vendors had to work around an uneven distribution of revenue throughout the year. This seasonality could lead to issues if for whatever reason part of the season was compromised. If the town suffered from early cold weather, they could have to stop their exports early. In other cases, an unreliable transporter could cause long delays, which shrunk the already short window of time during which the town hoped to make its profits for the rest of the year.<sup>146</sup>

Within the water season, it seems that most spa towns had their high and low months. The spa was not busy from the first of May all the way to the last day of opening. Typically, the summer was the height of attendance for spa visits.<sup>147</sup> The rest of the season was mostly comprised of locals, who worried less about treacherous rains, and who were most likely familiar with the local weather patterns and the state of the roads.

### *Managing the facilities and visitors*

There were two main ways of taking the waters, either internally, by drinking, or externally, by contact between skin and water. This latter exposure could be done either via bathing in the water directly, by the means of a shower, or by bathing in the water's vapours. In addition to this, the water was sometimes modified, by mixing mineral water with ordinary water, or by heating it up.

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<sup>145</sup> "Projet d'un règlement pour les eaux minérales du Royaume", 89e assemblée, (24<sup>th</sup> March 1777), SRM 112, dossier 17, ASRM. "art 1. Les intendants doivent se rendre aux fontaines à partir du premier mai ce qui correspond au début de la saison."; Raulin, "Copie d'un projet d'arrêt du Conseil portant règlement concernant les Eaux minérales, tant de France, qu'étrangères", (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. "les medecins intendants, les inspecteurs les chirurgiens des eaux minérales, établis par la Com Rle de medecine, se rendront aux fontaines dans les saisons des eaux, qui ne commenceront qu'au 1er may et finiront au commencement de novembre. il sera deffenses de faire usage des eaux à leur source avant ou après ces époques".

<sup>146</sup> Arnaud explained that his profits were limited because it was not currently the water season. Correspondence from Arnaud to the *Commission*, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM.

<sup>147</sup> One physician justified not living next to the spa he was supposed to be taking care of, by stating: "I reside there the month of august, the most essential time, and the only month when one bathes in the muds, before and after this time few people frequent these places". He added that outside of this window of time, only the locals visited the spring, and to them: "a physician is the most useless man". Correspondence from Merle to the *Commission* on the waters of Barbotan, 81e assemblée, (9<sup>th</sup> September 1776), SRM 112, dossier 9, ASRM. "C'est mal à propos que les Seigneurs de barbotan exposent que les malades sont sans secours, puisque j'y réside le mois d'aoust, tems le plus essentiel, et le seul mois ou on se plonge dans les boües, avant et après ce tems peu de monde frequente ces lieux, et ce sont les personnes des environs qui viennent prendre les bains et pour lors un medecin est l'homme le plus inutile".

Mixing the water also made the baths less potent, which was required for treating some conditions. Bathing had to take place at the spring, but the baths could look a little different from town to town. Sometimes, the *baigneurs* and *baigneuses* (the men and women who helped the patients with their baths) carried buckets of the water from the spring into a bathtub, and sometimes the tubs were filled by the spring directly. The waters could also be mixed with earths and clays to make mud baths.<sup>148</sup>

Vichy counted six mineral springs of varying characteristics. Some were warm and flat, others cold and fizzy, some halfway in between. The fountains all had established therapeutic practices and were recommended to different kinds of patients. They were named the Grand Puits Carré, the Fontaine Chomel, the Grande Grille, the Gros and Petit Boulet, and the Célestins. Water from this latter spring can still be purchased in bottles today. This diversity of springs meant that Vichy could offer a range of drinking and bathing practices.

The first set of rules regarding the administration of Vichy's waters came in 1745. One of the changes brought about by this text was the decision to limit access to the springs. Visitors had been up to that point free to help themselves to the various waters. The use of the baths had to be paid, but the waters themselves were free for the first half of the century. The expressed reason for putting a price on the springs was the large number of poor people who were "extremely disgusting because of misery, & many sorts of diseases", causing some of the wealthier visitors to be put off and apparently never drinking the waters.<sup>149</sup> This allusion suggested that the waters of Vichy were popular, with the crowds skewing poorer. Since the wealthier patients were more likely to pay for services, the town had a clear financial incentive to enforce stricter rules regarding the taking of the waters.

The 1745 rules did not contain much detail regarding how the town should be run. Its primary focus was to grant authority to the intendant of the waters to regulate their distribution.<sup>150</sup> While this intendant was still required to hand out waters for free "to the Inhabitants of the town of Vichy, as well as all the

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<sup>148</sup> An analysis of the waters of the Pyrenees in 1778 mentioned that the spring in question had naturally occurring 'muds' were in fact a disgusting swamp in the middle of a marsh without any facilities making them accessible. So the term mud was occasionally a very literal description, rather far from the kaolin and clay preparations of modern spas. Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM. "il est douloureux que la source de ces eaux soit ainsi abandonnée elles meriteroit l'attention du Gouvernement d'autant mieux que les Marais dans lesquels elle se repend, pourroient etre aisement desechés, il vienroit propre a etre cultivé et l'on retireroit un grand avantage de la source qui founiroit a plusieurs baignoires et a une boisson plus utile."

<sup>149</sup> "Règlement fait par M. Chicoyneau, premier médecin du roi", (1745), SRM 93B, dossier 24, pièces 1–11, ASRM. "Mais la liberté que tout le monde a eue jusqu'ici d'y puiser indifféremment, les plus riches comme les plus pauvres, dont la plupart sont extrêmement dégoûtans par la misere, & toute sorte de maladies, les uns dans des vaisseaux de verres, les autres dans de la terre ou du bois, & causent par-là une répugance, qui fait que plusieurs s'en retournent sans boire."

<sup>150</sup> Ibid.

Poor indistinctly, of whichever part of the Kingdom they come from”, they could no longer help themselves, and staff had to be placed at each spring in order to maintain order.<sup>151</sup> It was said that this staff ought to bar people from throwing detritus in the fountains, which was apparently a regular issue, and to make sure that no one got hurt in the process of retrieving the waters. This ruling seems to have been enforced for the remainder of the century. In fact, a situation took place in 1779, in which a Marquise came to Vichy, but took counsel from her own doctors instead of the local physicians. These private doctors made recommendations to her and her servant, Teste, who had injured his knee shortly before. Due to some misunderstanding, the servant was denied access to the spring, which led to an affair which ended up in court, and left behind a fifty pages folder of various hearings and discussions on the extent of the authority of the intendant.<sup>152</sup> Clearly, the 1745 rules were of importance to the city, even if they were not always closely followed.

These rulings were intended to bring a wealthier crowd to the waters. But the prospect of bringing in money came at a cost, as the town needed to invest in accommodation and facilities appropriate to receive more demanding guests. This was an expensive order. Talks of updating old installations and of replacing wood planks and bathtubs that were falling apart, occupied many pages in the municipal discussions.<sup>153</sup>

In the 1780s, the town undertook renovations in order to improve the state of the showers, as only one was functioning in the entire town.<sup>154</sup> Mineral water showers, though they were a common fixture of spa towns, looked nothing like modern showers. They rarely included any kind of plumbing. Instead, most showers consisted of a bucket suspended high in the air, with a hole at the bottom. Canvas or a robe would be put around the person sitting underneath, so as to not expose them naked to the sight of others. Then, the bather of the appropriate gender would walk up and down a ladder, refilling the bucket, so that the patient would constantly be under a thick stream of fast-falling water. By most accounts, this was not a particularly pleasant experience. The water was luke-warm, and the heavy stream fell hard on the skin. Some showers had ways of adjusting the height of the bucket, so that it could be tailored to the needs of the patient. One physician described that the shower in his spa was only mounted three feet in the air, which was not enough. The

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<sup>151</sup> Ibid, “Sera tenu ledit sieur Chapus, Intendant des eaux minérales & médecinales de Vichy, de tenir la main à l’exécution du présent règlement, de faire distribuer les eaux gratis aux Habitans de ladite ville de Vichy, de même qu’à tous les Pauvres indifféremment, de quelques endroit du Royaume qu’ils viennent audit lieu de Vichy”.

<sup>152</sup> Affaire d’Antoine Teste, homme de chambre de la marquise de Brante, (1779), SRM 93B, dossier 24, pièces 1–11, ASRM.

<sup>153</sup> Délibération des habitants, État et réparations à faire aux bains, (1758), Série HH2, AMV.

<sup>154</sup> Correspondence between Giraud and the *Société*, (1779–1788), SRM 93B, dossier 24, pièces 22–34, ASRM.

shock of the fall was an intended part of the therapy, and if the water fell from a low height, the shower was not thought to be very efficient.<sup>155</sup>

By 1788, plans were underway to construct a series of shower cabinets, with a height of seven feet, roughly two meters, at the highest. Discussions also took place to decide whether the height could be adjusted, given that seven feet was too high for certain applications. The renovation also planned for an adjustable debit of water. This meant that instead of the simple bucket with a hole at the bottom which had been used thus far, the showers should include proper taps. They would still have to be refilled by hand though, as the expenses of plumbing were far too high.<sup>156</sup>

According to the Vichy habit, the waters used in the showers were always cut with common water, but there again, new regulations would ensure that this had to be done a day before, and measured precisely, so as to keep the effects of the waters up to standard.<sup>157</sup> Those same documents also lamented the lack of public baths in Vichy, as there were only private, individual baths, which had to be paid for. The drinking of mineral waters was also subject to precise practices. There were typically set quantities of water that each patient had to drink per day. The waters were sometimes cut with wine or milk, but some physicians recommended against this. The daily prescriptions were particular to the spring. Some were prescribed in quantities of a few ounces per day, others, could be consumed in higher volumes. In Vichy, the usual dosage was between one and two pints a day.<sup>158</sup>

The people who came to Vichy belonged to different groups, and stayed in different kinds of facilities. Some stayed at the bath's inn. A list of its residents is available for the year 1792. The majority of people on this register were bourgeois, and travelled in various group sizes. The register stated for example:

On April 26<sup>th</sup> 1792

has arrived at my house Mrs le chanteau Madame rillet de planta from Paris

on the same day m. Bessier confectionner in Paris

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<sup>155</sup> Correspondence from Jaulhac to Lassone, concerning the baths of the Mont d'Or, (1784), SRM 90A, dossier 23, pièce 17, ASRM. "on y avait donné jusqu'a présent la douche dans les bains avec des seaux de bois suspendus a un [illisible] a la hauteur de trois pieds tandis qu'on élever l'eau a volonté avec une pompe et du graduer la chute et le volume avec différents ajustoires selon le besoin."

<sup>156</sup> Report by Delaporte on the baths in Vichy, (1788), SRM 93B, dossier 24, pièce 35, ASRM.

<sup>157</sup> The practice of diluting waters was commonplace in Vichy. Décoret, *Une page sur Vichy et ses environs*, les hospices et leurs fondateurs, deuxième partie, (1755–1895), AMV.

<sup>158</sup> The prescription for the waters of Pougues, Bussang or Saint Myon was between two and four pounds a day, which was a significant amount of water to consume. For Vichy, the dose was one to two pints. Raulin, "Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris.", 13. "La dose est d'une pinte jusqu'à deux."

[...]

On the 21<sup>st</sup> of May, Mr duclos surgeon, in paris, with his wife two children, one servant.

On the 23<sup>rd</sup> of May, Mr Seneze of clermont ferrand, with his servant.<sup>159</sup>

The professions of visitors varied, and were mostly mentioned for the men. There were however several women travelling alone, and a lot of people referred to only by name and city of residence. A few couples made the trip together too. Interestingly, a lot of visitors came from Paris, hinting at Vichy's good relations with the capital.

The paying guests could decide to stay for how long they wished, usually according to the recommendations of a physician. For those who came to Vichy via the hospital, the poor and the indigent, the dates were not as flexible. There were intervals of two, and after 1758 three weeks, during which those patients could stay at the hospital. They were then rotated with the next group of indigents.<sup>160</sup>

Occasionally, Vichy would host guests of high nobility. Those instances were of exceptional importance to the city, as they were then used for decades as a form of endorsement of the waters. But they also implied complex logistical challenges, since such people rarely travelled alone, and they were less accustomed to modest hosting standards. One of these visits took place in 1786, when Marie Adélaïde (1732–1800) and Victoire Louise Marie Thérèse de France (1733–1799), daughters of King Louis XV (r. 1715–1774), came to Vichy to take the waters.<sup>161</sup> All services in the town were used to their highest possible capacity. The syndic had to make “exceptional spendings”, as virtually every house in Vichy had to be requisitioned in order to host the large entourage of the princesses.<sup>162</sup> But these high-profile visits, although very costly for the town, also came with clear benefits. For one, it appears that the visitors made a large donation to the hospital. They also requested, and helped fund the construction of better baths, which would in turn serve other guests. This visit was also not the matter of mere days. In total, the princesses stayed

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<sup>159</sup> Jacques-François CHOMEL, (1792), Série II 1, AMV. “Du 26 avril 1792 est arrivée chez moi Mad le chanteau Madame rillet de planta[?] de paris du meme jour m. Bessier confisseur de paris [...]

Du 21 maÿ Mr, duclos chirurgien, de paris, avec son epouze deux enfants, une domestique.

Du 23 maÿ, Mr Seneze de clermont ferrand, avec sa domestique.”

<sup>160</sup> Décoret, *Une page sur Vichy et ses environs*, les hospices et leurs fondateurs, deuxième partie, (1755–1895), AMV.

<sup>161</sup> Remboursements et venue de Victoire, Louise, Marie-Thérèse (Mesdames de France - Filles de Louis XV), (1786), Série BB 6 - CC 9, AMV.

<sup>162</sup> Ibid, Services extraordinaires suite à la visite de “Mesdames aux eaux de Vichy”.; Création d'une nouvelle fontaine, (1780), Série DD11, 1781–1786, n°41, AMV. “l'Evaluation de ces produits a été faite pendant le séjour des Princesses dont la suite a occupé toutes les maisons.”

in Vichy for over a month, which meant that they were very familiar with the town, its intendants, and all the various springs. This again, meant nothing but excellent publicity for Vichy, and one of the reasons for the town's good relations with the capital.

*The intendants: local administrators and ambassadors of the waters*

The main goal of the above-mentioned 1745 ruling was to cement the intendants as essential actors in Vichy. They were responsible for all things medical in the town. This encompassed the control over the administration of waters, the prescriptions, which waters had to be given to which patients, and care for both the bourgeois staying at the inn and the poor at the hospital. The town went through several intendants throughout the eighteenth century. All of them were, by necessity, physicians. The activity of these intendants highlights the close relationship between Vichy and Paris.

The first ever intendant in Vichy was Claude Fouet (1645–1715). He was a Vichy native who obtained his doctorate in medicine at the Faculty of Paris. His father was the director of the royal house of baths, and an apothecary, making his son's career path not completely unexpected. Fouet was nominated in 1684 under Louis XIV as intendant. In the same document, the king also separated the administration of the waters of Vichy from those of the Bourbonnais, the Velay and the Auvergne. With the rise in popularity of the springs, they could no longer be governed all together under the same administration, hence why Fouet received this special title.

Instead of earning a fixed salary for his position, Fouet received a house in Vichy, the Maison de l'Intendant (or House of the Intendant), as well as an allowance based on the export of the waters. This amounted to 12d on each bottle (of a pint and a half) which was drawn and exported outside of the city. This meant that the intendant whose primary task it was to oversee the waters in the town, was also incentivised to promote the export of the waters, as early as 1684.<sup>163</sup>

Fouet's successor, François Chomel (1678–1756), also embodied the connections between Vichy and the capital. Although he studied medicine in Montpellier and not in Paris, Chomel's father was the Ordinary physician at court, and his brother held a position at the Academy of Sciences. When Chomel was nominated to the post of intendant in 1716, he started living seasonally, spending his winters in Paris, and coming to Vichy in May for the start of the water season. Chomel did much to develop both the facilities in Vichy and the export of the waters. Under his jurisdiction, the price of the exported waters was raised, in order to fund the hospital's renovations. He made many complaints about the indecency that went on in Vichy, due to a lack of separate facilities for men and women for example. He also tried to remedy the unpleasant nature of some of the treatments, and advised the

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<sup>163</sup> Dossier thématique Claude Fouet, (1645–1715), AMV.

visitors, prescribing a variety of apothecary treatments to be taken alongside their cures, such as bloodletting.<sup>164</sup> He retired from his job in 1739 to move back to Paris indefinitely.<sup>165</sup>

Following Chomel, the position became a little less stable, as a few intendants only stayed on the post for a short time. For some decades, there was little clarity regarding which of the intendant or his assistant, actually did the work of intendency. The next notable name was Antoine Giraud (1739–1794), who was the assistant to the intendant Emmanuel Tardy for most of the second half of the eighteenth century.<sup>166</sup> In effect, he was acting as intendant, as Tardy delegated most tasks to him. Giraud, like Chomel, spent much of his time in Paris.<sup>167</sup> He was the first intendant to work under the authority of the *Société de Médecine*, when it started its operations in 1778.<sup>168</sup> This was a change, as the intendants had thus far only worked under the authority of the First physician of the king who had been the head of the administration of mineral waters since 1605, but this change did not appear to cause many issues for Giraud. His real problems came with the revolution, when Vichy suffered from a drastic decline in attendance. Debates took place, suggesting that perhaps the waters of Vichy should be declared as state property, and should no longer belong to the town. This did not come to pass, but soon after these discussions, the intendant, who happened to be in Paris, was executed under suspicions of royalist sympathies.<sup>169</sup>

The role of the intendant was largely defined by the individual who held the title. Because many of them had ties to Paris, the Academy and the royal court, the position gained a certain amount of prestige. It also required a lot of work. One event that took place in 1781 in Vichy highlighted this latter role. Giraud, the intendant at the time, was standing on the main town square, conversing with a Marquis who had come to complain about some leaves that had fallen in one of the fountains. Already trying to appease the noble man, the intendant was interrupted by another visitor, Guibert, who came barging in, and started yelling at Giraud.

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<sup>164</sup> Dossier thématique François Chomel, (1678–1756), AMV.

<sup>165</sup> Chomel is named in the Paris notary registers, alongside his wife, as putting a lease on a shop he owned. See: Minutes et répertoires du notaire Pierre Le Boeuf de Le Bret, 22 octobre 1749–décembre 1771 (étude LXXVII), Transport, (21<sup>st</sup> May 1751), MC/ET/LXXVII/236, AN.; Minutes et répertoires du notaire René Baron, 2 avril 1740–25 octobre 1762 (étude XXXV), Bail, boutique, Paris, rue Trainee, Bail, (7<sup>th</sup> October 1751), MC/ET/XXXV/668, AN.

<sup>166</sup> “Nomination par Jean Senac, conseiller ordinaire du roi en ses conseils d’État et privé, premier médecin de Sa Majesté, surintendant des eaux, bains, fontaines minérales et médicinales du royaume, de Giraud, comme intendant des eaux minérales de Vichy et d’Haute-Rive, comme adjoint et survivancier d’Emmanuel Tardy”, (1766), SRM 93B, dossier 24 pièce 17, ASRM.

<sup>167</sup> One letter referenced Giraud as being absent during a deliberation and subsequently asking for its verdict. Price of the waters, (1788), SRM 93B, dossier 24, ASRM.

<sup>168</sup> Giraud appears numerous times in the *Société’s* folder dedicated to correspondence with Vichy and its residents. Vichy, (1778–1788), SRM 93B, dossier 24, ASRM. See chapter 3 for further details on the *Société de Médecine*.

<sup>169</sup> Dossier thématique Robert Antoine Giraud, (1735–1794), AMV.

Mr de Guibert arrived with the air of fury and with no further preliminary covered me in all possible invectives; among other things, he told me that I was a beast, an ignorant, incapable of fulfilling the functions of the position I hold and that he would file a complaint, the whole thing accompanied with the designations that are only used in the guard and in bad places.<sup>170</sup>

After this scolding, Giraud (who is the one recounting the event in a letter), kept his response “moderate” and got to the root of the problem. The man was upset that one of the physicians working in Vichy had been unkind to his wife, regarding the health of their five-year-old daughter. The physician had apparently told her that the little girl’s illness had been worsened by an over-prescription of medicine. As this was an indirect attack on the parents, the mother in question had been very hurt by the bluntness of the comments, thus prompting the outburst of the father against the physician. Despite attempting to make himself appear as the reasonable person in the conflict (he even claimed everyone “applauded” his great poise during the incident), Giraud did ask for some advice on how to best handle such situations. Although he supported the honesty of his colleague’s diagnosis, he admitted that the couple had reason to be upset at the bluntness.

This case, although anecdotal, shows a rare glimpse into the everyday life at the spring. The people who visited them were after all sick, and often worried about their own health, or that of the people they came with. And this led to tense situations at times, and it fell on the responsibility of the intendant to resolve such issues. The reputation of the town depended on the intendant’s lightness of touch in such situation, which is likely why Giraud felt the need to seek guidance in his letter.

The intendant of Vichy was a powerful position, because it combined a wide array of prerogatives. The intendant oversaw relations with the First physician, had a say in the construction of new installations, made decisions regarding the export of waters, but he was also a physician. And because of this medical status, the intendants of Vichy maintained contact with other medical institutions, and contributed to increased knowledge of new diseases and the study of epidemics from their vantage point at the spa. Several intendants of Vichy wrote memoirs about the illnesses they saw at the hospital. In one case, Giraud wrote to the Société de Médecine asking for advice on how to deal with an outbreak of scrofula, which was afflicting many patients in Vichy.<sup>171</sup>

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<sup>170</sup> Correspondence from Giraud to the *Société*, (1779–1788), SRM 93B, dossier 24, pièces 22–34, ASRM. “avant que j’ai pu répondre, Mr. de Guibert est arrivé avec l’air de la fureur et sans autre préliminaire m’a accablé de toutes les invectives possibles ; entre autres choses, il m’a dit que j’étois une bête, un ignorant, incapable de remplir les fonctions de la place que j’occupois et qu’il en porterois des plaintes le tout accompagné des epithetes dont on ne se sert que dans les corps de gardes et dans les mauvais lieux.” “quoique vivement affecté de pareils propos, ma réponse a été modérée et j’ai la satisfaction d’être applaudi par toutes les personnes qui sont icy”.

<sup>171</sup> It may also have been Tardy who wrote the report. Giraud was the assistant intendant for much of his time in Vichy, and Tardy was the main intendant, but in actuality, Giraud did the vast majority of the work in Vichy, hence why I suspect that he was also in charge of keeping

Giraud also wrote to discuss a common disease which afflicted the orphans at the hospital, asking whether it was known to be contagious, since “the authors” – meaning ancient medical authors – were inconclusive on the subject.<sup>172</sup>

The communication between the intendant and the Parisian institution reveals a tendency that will be studied in further chapters discussing the *Société de Médecine* and its overall role in promoting scientific exchange and the circulation of knowledge about mineral waters. But from the point of view of Vichy, this *Société* was mostly a resource, a group of colleagues which could be contacted when the spa town was facing difficulties in treating certain diseases. The rest of the time, the intendant likely kept records of the various diseases that brought people to Vichy, without necessarily seeking counsel from other physicians. There are a few examples of such registers, in which the people who visited were named, and their symptoms described. The intendant wrote down which type of treatment they had received and its effects.<sup>173</sup> This was considered good practice in other spas, as empirical data allowed for a better knowledge of the action of the waters. The keeping of such records was the true advantage of visiting Vichy. As Tardy argued in a 1755 pamphlet, the intendants had a knowledge of their local waters that no outside physician could ever hope to surpass.<sup>174</sup>

#### *Handling controversy: the conflict with the intendant of Châteldon*

Vichy was not the only spa town of its region. Indeed, it was only toward the end of the seventeenth century that its intendency had been separated from that of neighbouring spas. In the 1770s and 80s, the vichysois found themselves in conflict with the intendant of the nearby waters of Châteldon. The conflict between the Vichy intendants and Jean-Baptiste Debrest, intendant at Châteldon, can be traced through a series of letter to the *Société*. Its unfolding reveals another aspect of the role of the intendants, and showcases the importance of keeping the reputation of the waters intact.

The source of the conflict was the presentation of a book by Debrest to the *Société* in 1778. This book discussed his waters of Châteldon, as well as some of the Vichy waters like the spring of Hauterive.<sup>175</sup> Among other things, this book contained a call to end the many frauds and abuses that took place in

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contact with the *Société*. Report by Caille on “Mémoires sur les scrofules endémiques dans l’hôpital de Vichy”, (31<sup>st</sup> May 1778), SRM 93B, dossier 24, pièces 18–19, ASRM.

<sup>172</sup> Robert-Antoine Giraud de Prelle, intendant des eaux minérales de Vichy, SRM 93B, dossier 24, pièces 17–35, ASRM.

<sup>173</sup> Observations on the effects of the waters of Vichy, (ca. 1777), SRM 93B, dossier 24, pièce 20, ASRM.

<sup>174</sup> Tardy, “Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.”, 45.

<sup>175</sup> Correspondence from Debrest to the *Société*, (1778–1779), SRM 93B, dossier 24, pièces 12–16, ASRM.

Vichy.<sup>176</sup> He blamed this on the “distracted” authority exerted on Vichy by the First physician in recent years.<sup>177</sup> After having described the extent of the malpractice that took place in Vichy, he pleaded for his waters of Châteldon, which were in his mind very useful, far too unknown, and not plagued by the poor management of its careless neighbours.

No one would be surprised to hear that the administrators of Vichy were not thrilled about the existence of such a memoir. But the ensuing conflict, which continued for the following two years, is quite revealing of some of the actual insecurities that a place like Vichy could hold regarding its spa. The intendant initially tried to have the book revoked, possibly with the assistance of Arnaud, the distributor of mineral waters in Paris who made a lot of his profit from the sale of Vichy water. Giraud, the intendant of Vichy, wrote directly to the First physician, Joseph Raulin (1708–1784), who initially sided with him, believing that Debrest was simply trying to hurt the reputation of the Vichy waters for his own profit.<sup>178</sup> Debrest defended himself to the First physician, explaining that his intention was simply to fight the prevailing charlatanism that took place in Vichy.<sup>179</sup> In response, Giraud wrote once again to the First physician. He complained about the damage that Debrest was trying to inflict on the reputation of the Vichy waters, all while reassuring his reader that he was not going to dwell for too long on the many faults of Mr Debrest, as this would be seen as to be “scandalous and irrelevant”.<sup>180</sup>

Debrest found an ally in the physician Aufauvre, who was based in Vichy but was seldom allowed to practice his trade because of the monopoly of the intendant on the distribution of the waters. Aufauvre defended Debrest in a letter in which he decried the greed of the Vichy intendant, which led him to deny many people proper medical care.<sup>181</sup> It even appears as though Debrest and Aufauvre took advantage of the mounting controversy surrounding the

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<sup>176</sup> Jean Baptiste Debrest, “Traité des eaux minérales de Chateldon, de celles de Vichy et Haute-Rive en Bourbonnois, avec le détail de leurs propriétés Médicinales & leur analyse,” (Chez la veuve Faure et chez Didot, à Moulins & à Paris, 1778).

<sup>177</sup> Ibid. Debrest mentioned that the superintendency over mineral waters had temporarily been separated from the First physician's prerogatives, leading to a “distracted” (“distraite”) administration of the waters.

<sup>178</sup> Correspondence from Debrest to the *Société*, (1778–1779), SRM 93B, dossier 24, pièces 12–16, ASRM. “le sr arnaud [...] étoit parvenir à intimider mr raulin”. “je n'ai rien dit qui ne soit vrai, et loin de blamer m raulin, on doit au contraire lui savoir gré, d'avoir préféré l'intérêt public, à son avantage personnel, puisque lors de l'approbation de mon traité, l'inspection et la police des eaux minérales du royaume, appartenoient à la commission royale de medecine, qui retiroit, dit-on, un gros bénéfice du bureau des eaux minérales, établi à paris, chez le sr arnaud.”

<sup>179</sup> Ibid, “je travaillerai avec toute l'ardeur dont je suis capable, pour arrêter les progrès du charlatanisme, mais il faut pour les provinces une déclaration du roi, pour nous autoriser, à nous opposer à la vente des remèdes empiriques qui se distribuent dans les bureaux établis à cet effet.”

<sup>180</sup> Correspondence from Giraud to the *Société*, (1779–1788), SRM 93B, dossier 24, ASRM. “Je ne vais pas parler de tous les défauts de M Debrest, ça serait scandaleux et peu à propos.”

<sup>181</sup> Correspondence from Aufauvre to the *Société*, (1779), SRM 93B, dossier 24, ASRM.

marquise's servant, as mentioned above, and were responsible for involving police in the question.<sup>182</sup>

The outcome of the conflict was more nuanced than could be expected. Debrest said that he received a lot of threats and intimidations attempts from several people in Giraud's network.<sup>183</sup> But in writing to the First physician, he used an argument which seemed to strike a chord, with both his reader and the Vichy intendants. He said that the fraudulent practices he had been describing were already acknowledged by Tardy, in his 1755 pamphlet on the subject.<sup>184</sup> According to Debrest, Tardy, in conjunction with his assistant Giraud and the Paris distributor "have it in their interest to maintain the deception, in which the public has always been".<sup>185</sup> This led the First physician to re-allow the publishing of Debrest's book. In addition, a few letters from Giraud in 1780 show that Debrest's points, although painful, had been heard by the Vichy residents. Stricter hours had been placed regarding the visits to the baths and showers, which Giraud found inconvenient, but acceptable. He also referenced Debrest's complaints when discussing the construction of new baths, showing that the rival intendant's plea had had an impact. In a sense, Vichy was so dependent on its waters for its economic survival, that it had to take attacks very seriously. Failing to silence the vocal critic, the vichyssois decided to accommodate him, at least to a certain extent.

#### *Exporting the waters: a crucial stream of revenue*

The waters of Vichy were exported to other cities throughout the eighteenth century; the earliest evidence of such transports dating to 1686.<sup>186</sup> This was a regular subject of discussion for the municipality. On many occasions, some started to lobby for a raise in the price of the exported waters in order to finance various projects. Almost always though, these projects were related to the waters, the hospital, or the bathing installations.<sup>187</sup> The price of the bottle

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<sup>182</sup> Correspondence from the intendant in Moulins to his subdelegate, (1779), SRM 93B, dossier 24, ASRM.

<sup>183</sup> Correspondence from Debrest to the *Société*, (1779), SRM 93B, dossier 24, ASRM. "sottises grossières".

<sup>184</sup> Debrest's accusations were not entirely unfounded. A pamphlet written by Tardy, the Vichy intendant, did in fact acknowledge the existence of numerous issues, particularly regarding the export of waters. Tardy, "Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.", 17–23.

<sup>185</sup> Correspondence from Debrest to the *Société*, (1778–1779), SRM 93B, dossier 24, pièces 12–16, ASRM. "le sr arnaud, sollicité par les sr tardy et giraud medecins, qui ont tous trois le même intérêt à entretenir l'erreur, dans laquelle le public a toujours été sur la vertu des eaux de vichy, étoit parvenu à intimider mr raulin".

<sup>186</sup> Claude Fouet, "Nouveau système des bains et eaux minérales de Vichy, fondé sur plusieurs belles expériences, & sur la doctrine de l'acide & de l'alcaly," (A Paris, chez Robert Pepie, rue S Jacques, 1686), 193.

<sup>187</sup> The Vichy inhabitants promise to pay 2, 760<sup>fr</sup> a year in order to finance the renovation of the facilities, which they intend to finance by raising the price of exported waters to 2<sup>fr</sup>. Construction de nouveaux bâtiments, (1788), SRM 93B, dossier 24, pièces 43–44, ASRM.; Délibération des habitants, État et réparations à faire aux bains, (1758), Série HH2, AMV.

was the primary source of income both for the intendant, who was obliged to use part of this income in order to maintain the installations, and the hospital.<sup>188</sup> Discussions around the price of the waters were common because the waters of Vichy were fairly affordable when compared to other springs in the kingdom, so there was space to raise prices. But the price of waters was also regulated nationally, and at several points, the intendant was asked by other municipal authorities to intercede with the First Physician in order to ask for a raise in price to be approved.

For some time, the waters of Vichy were sold in a dedicated bureau in Paris, which stored only Vichy waters.<sup>189</sup> Until he needed to win his support in the fight with Debrest, Giraud had even forbid Arnaud, the general distributor of waters in Paris, from selling Vichy waters in his bureau. Citing the right of the intendants of Vichy to have their own depositary of waters in Paris, he effectively tried to create a monopoly. He soon had to waver this attempt however, and granted Arnaud the right to sell his waters.<sup>190</sup>

Overall, the Vichy intendants were successful in promoting the export of their waters, which were sold in many French bureaus by the end of the eighteenth century. The vichyssois argued that this was due in part to the waters' stability. While most fizzy waters lost their gas in transport, Vichy's hot spring apparently produced waters resilient to shaking, meaning that they kept their aeration all the way to their destination, making them a particularly good candidate for transportation.<sup>191</sup> Thanks to this desirable characteristic and the work done by the town and its intendants, the Vichy waters had become, by the onset of the revolution, a household name, known by most buyers as high-quality remedies.

This case study on Vichy shows that, when it came to the eighteenth century, the revenues coming from mineral waters were not insignificant, but they were still just sufficient to finance the ongoing activities in the town and the upkeep of the spa facilities. Many similarly sized towns earned equal or lower revenues from their own springs. Few of them enjoyed such close relations

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<sup>188</sup> M. Gaston Charonnet, "Procès dit du "sou par bouteille", rapport à M. le Maire de Vichy, président de la commission administrative des hospices", (1939), AMV. "L'Intendant, dont les charges sont modifiées, voit ajouter à son propre prélèvement de douze deniers par bouteille de trois chopines un prélèvement supplémentaire de deux sols, soit vingt-quatre deniers ; au total 36 deniers, mais il devient tenu d'en reverser à l'Hôpital la moitié, soit 18 deniers. Son bénéfice n'est donc que de 6 deniers."

<sup>189</sup> Décoret, *Une page sur Vichy et ses environs, les hospices et leurs fondateurs*, deuxième partie, (1755–1895), AMV. As of 1771, Tardy is allowed to sell the waters of Vichy in Paris, charging 26<sup>s</sup> for a box of fifty-four one-pint bottles.

<sup>190</sup> Correspondence from Giraud to the *Commission*, 106e assemblée, (1<sup>st</sup> June 1778), SRM 113, dossier 16, ASRM. "au moyen de la présente déclaration, je renonce expressément au droit exclusif que je me suis attribué et je me desiste de toutes prétentions tendantes à interdire au directeur général des Eaux minérales de Paris, nommé par la Commission Royale de médecine, la vente et distribution des eaux minérales de Vichy".

<sup>191</sup> Construction de nouveaux bâtiments pour les bains, (1788), SRM 93B, dossier 24, pièces 43–44, ASRM. "Cette assertion qui peut être vraie à l'égard d'un grand nombre d'Eaux minérales, ne l'est pas à l'égard de celles de Vichy et particulièrement des Thermales."

with the Parisian regulators and distributor of mineral waters, with the exception of the springs situated very close to the capital. Apart from the special treatment this entailed, Vichy remains a representative example of a successful spa town in eighteenth-century France. In that sense, its daily activities, struggles and concerns, were rather comparable to those of a town like Bagnères-de-Luchon for example.<sup>192</sup> And despite its overall moderate revenue, there were no French springs in the eighteenth century with drastically more financial success or prestige than Vichy. While it was nowhere near reaching the level of luxury of foreign spas, it was essentially the best that France had to offer. That being said, because the scale from poorer spas to richer ones was fairly narrow, the struggles of Vichy are still representative of less successful towns too. Smaller spa towns differed from Vichy in so far as they sometimes had almost no facilities, and that their intendants were even more absent than those of Vichy. Despite these differences, the problems they encountered were in the end often the same.

## The expanding market of bottled waters

For a commerce of bottled mineral waters to exist, a number of conditions had to be met. First, there had to be both supply and demand.<sup>193</sup> On the supply side, there had to be a spa owner, be they an individual or a collective, willing to export their waters to be bottled, and to make the necessary arrangements with suppliers and transporters. In addition, the water itself had to flow in a large enough debit to fill the bottles. On the side of demand, an active market necessitated interest from the public, created either through active communication, hearsay, or – since this market concerned a medical product – by the prescriptions of physicians. In order to link suppliers and buyers, there had to be a system of transportation, which did not render the waters completely unaffordable. If transporting a water from the Pyrenees to Paris increased its

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<sup>192</sup> Many similar problems to those of Vichy can be seen in the documents related to other spa towns. See, among others: Eaux de Bagnères-de-Luchon, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM.; Dossier Carrère, chargé par la SRM de faire l'analyse des eaux minérales de Bagnères de Luchon, (1784), SRM 93B, dossier 37, pièces 2–24, ASRM.; Copie d'un projet d'arrêt du Conseil portant règlement concernant les eaux minérales tant françaises qu'étrangères, proposé par Raulin, 89e assemblée (24<sup>th</sup> March 1777), SRM 112, dossier 17, ASRM.; Rapports sur les dégradations de certains établissements de bains, 100e assemblée, (5<sup>th</sup> January 1778), SRM 113, dossier 10, ASRM.

<sup>193</sup> One caveat that should be mentioned here is that the following discussion will focus largely on the supply side of the market. A view of the consumer perspective, tracing the factors influencing demand and drinking practices, would represent a fascinating study. They are unfortunately some archival limitations to performing a wide-scale study of the consumer side of the eighteenth-century water market. Sources are available for select individuals, but not for the majority of spa goers, and bottle drinkers, hence the choice to focus primarily on the suppliers in the later parts of this chapter.

price a hundredfold, it would become little else than a novelty item for the ultra-wealthy, and not a regular consumer product.

But the simple laws of supply and demand would not be quite sufficient to explain this specialised market. Mineral waters were a medical product, and the value of remedial effects is often difficult to correlate to monetary sums. If a water did manage to cure a person's seemingly unshakable illness, they could be seen as invaluable. In actuality, their actual price made them more comparable to low-level luxury items. This raises important questions regarding pricing, which will be addressed in the following section.

Because of the difficulties in assigning an exact value to mineral waters, a number of layers of trust had to be built and sustained in order to maintain clientele. Trust is an important part of all markets. Sellers of wine, jewellery, spices or grain all had to find their place in a complex supply chain, and they all had to gain the trust of buyers in order to make profits. Mineral waters presented two important challenges regarding trust. First, they were an incredibly easy product to fake. While making fake gemstones was certainly possible, it was not within reach of any fraudster to make a convincing false emerald.<sup>194</sup> A fake mineral could, however, be made by virtually anyone. All a fraudster had to do was take common water and enhance it with some salt or plant in order to give it a more convincingly 'mineral' appearance. Worse yet, these fabrications were difficult to separate from the authentic product. A physician in Bordeaux described mineral waters as "a merchandise on which it is uniquely easy to fool the public, and even people of the art".<sup>195</sup> Second, mineral waters were medical products. To have been tricked into buying cheap wine at a premium price was certainly an inconvenience, but it was not life-threatening. A fake remedy could on the other hand have disastrous results. These two reasons made maintaining a solid balance of trust an essential tenant of this market.

Consumers of mineral waters needed to act in faith twice. First, they had to have confidence in the remedial qualities of the waters themselves, especially when no prior reputation accompanied them. Second, they had to believe that the sellers were unlikely to defraud them, and that every person in the supply chain had been equally trustworthy. This is where the two branches of the mineral water market really differed. A person travelling to the spring only needed to have trust in the mineral waters themselves, as a potent remedy that could cure the ill. This trust was established through a few different means, including the endorsement of other patients, the recommendations of trusted

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<sup>194</sup> Marjolijn Bol, "Coloring Topazes, Crystals and Moonstones: The making and meaning of factitious gems, 300–1500," in *F for Fakes: Hoaxes, Counterfeits and Deception in Early Modern Science*, ed. Marco Beretta and Maria Conforti (Sagamore Beach: Science History Publications, 2014).

<sup>195</sup> Eaux minérales de Bordeaux, 3e assemblée, (5<sup>th</sup> October 1772), SRM 111A, dossier 2, ASRM. "une marchandise sur laquelle il est singulièrement facile de tromper le public, et même les gens de l'art".

physicians, and the communication efforts made by the spa owners. But once convinced of the efficiency of the waters, the visitors had no reason to fear for the quality of the waters at the spa, since they could see it spring from the ground with their own eyes. If the person chose to instead have the water shipped to them, they had to place trust in the personnel at the town, and in all those who were involved in the shipping process. Moreover, they had to believe that the product they received at the end of the distribution chain was still effective. Even if the shipping process operated entirely fairly, there was no blanket guarantee that the water had not naturally deteriorated in transport. In order to grow, the market of waters had to overcome the instability of the waters, and the scepticism of both buyers and physicians.

*The early days of mineral water transportation: local arrangements and short distances*

The bottling of waters initially only concerned a number of spas which enjoyed a solid reputation, the likes of Forges, Vichy or Bourbon-Lachambault. But as time went on, not all transported waters had to be associated with these household names. The bottling technology presented an opportunity for lesser-known springs to join the market without having to attract a significant in-person clientele. This was possible because, while deciding to visit a spa town depended much on its reputation, the market of bottled waters was much more dependent on regulation, and on the ability for regulators to check the quality of the waters throughout their journey, notably using the new tools provided by chemistry. This meant that although difficult, savvy spring-owners could compete with the more famous waters, if they complied with regulation, and this was especially true on a local scale.

It is difficult to date the exact beginning of this practice. It is very likely that some form of transport already took place in the late medieval era, but finding out when this became more prevalent, and to what extent people were ordering waters from springs in the early modern period, is subject to speculation. The literature on the subject remains indecisive.<sup>196</sup> It is clear, at least, that by the end of the seventeenth century, the practice of transporting waters was common enough to be seen as an issue by regulating authorities. The English chemist Boyle testified to this, writing in 1684 about the “many Persons” who carried waters instead of visiting the springs, sometimes across “a great distance, or even to another country.”<sup>197</sup> In any case, it is clear that transported

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<sup>196</sup> Brockliss, “The Development of the Spa in Seventeenth-Century France,” 44. “nothing has been said so far about the consumption of bottled mineral water during the Grand Siecle”.

<sup>197</sup> Robert Boyle, “Short memoirs for the natural experimental history of mineral waters : addressed by way of letter to a friend,” (London: Printed for Samual Smith, 1684), 77. “many Persons, that drink Mineral Waters, cannot well, either for want of strength or conveniency, repair immediately to the Spring First, but are oblig'd to drink them in their Beds or their Lodgings, and perhaps to have them transport|ed to a great distance, or even to another country.”

waters existed in the seventeenth century, but it was only in the eighteenth century that the practice became systematised.

The surge of interest in bottled mineral waters can be viewed in the writings of worried physicians of the late seventeenth and early eighteenth century. Writing in 1686 and 1697 about the waters of Vichy and Forge respectively, two physicians independently of each other cautioned the public against the risks of drinking transported waters. In 1718, Esquirou, a water analyst at Vic-sur-Cère offered concrete recommendations regarding water transportation. He first addressed the practice of transporting the waters from the spring itself, which was located in the mountains, to the nearby town:

If the strength [of the patients] allows it they must go to the spring [*fontaine*], our waters lose a part of their volatile salt in transport: besides, the good company that one usually finds there, and the exercise that must be done in order to get there contribute in no small way in helping [the waters] to pass well.<sup>198</sup>

In this case, it is apparent that transport could be a small-scale affair, like transporting a glass of water from the spring to the bed of patients who were unable or unwilling to hike up the mountain. But transportation could also be done across wider distances. For those cases, Esquirou gave further recommendations. He first urged the buyers to be mindful of the integrity of the transporters, proposing that it was preferable to travel to Vic-sur-Cère and ask for the bottles there; authentic waters were distributed in glass or sandstone bottles, and should be properly sealed with wax. The transporter also had to go all the way to the mineral spring, rather than filling the bottles at any fountain in Vic-sur-Cère. Esquirou advised against the use of barrels, which could contaminate the waters with oils and salts leftover from previous cargo. He also added that “we” would be happy to provide a certificate of authenticity of the waters, probably referring to himself and the other administrators at the spring.<sup>199</sup>

Several individual springs had these kinds of ad hoc regulations and arrangements.<sup>200</sup> The most common buyers of bottled waters were past visitors who wanted to experience the remedial aspects of the waters without having to make the trip a second time. In this case, their trust in the remedial power of the spring was already established, as well as the relationship with some of the staff. There is much evidence to indicate that exports in the early

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<sup>198</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “Si les forces le permettent il faut se rendre a la fontaine, nos eaux perdent par le transport une partie de leur sel volatil : d'ailleurs la bonne compagnie qu'on y trouve pour l'ordinaire, et l'exercice qu'il faut faire pour y aller ne contribuent pas peu a les faire passer.”

<sup>199</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

<sup>200</sup> See another example: Correspondence from Chifoliau to the *Société*, (1783), SRM 92B, dossier 36, ASRM. “Cy devant chaque Buveur payait au propriétaire ou fermier de la fontaine 6<sup>e</sup> par mois pour lui apporter les eaux en ville.”

eighteenth century were predominantly local, as wealthy customers in nearby towns were willing to pay transporters to fetch water for them.

Such local transports were not sufficient to support a large expansion of the market. They required interpersonal connections, trust, as well as a keen knowledge of local custom, measuring systems, certificates, and prices. Eventually a new system emerged, one that could be scaled to match the growing demand. This new system was based on a new kind of institution: the specialised bureau of distribution of mineral waters.

*The bureaus of distribution of mineral waters: a kingdom-wide phenomenon*

A bureau of distribution of waters, as its name suggests, was a shop specialising in the sale of mineral waters. These bureaus were typically located in cities and towns and staffed by a married couple, with the husband often trained as an apothecary. This was not universal as confectioners and other kinds of non-medical professionals were also found among bureau tenants. There were also cases of unmarried women tending to bureaus. Antoinette Lacroix de Montauban, for example, kept a bureau for over two decades, and was said to have inherited her knowledge of mineral waters from her mother.<sup>201</sup> In other cases, a widow would keep the tenancy of the bureau after her husband passed away. Widowed tenants could renew the permits necessitated for the continued activity of the bureau, and were allowed to sign with their own names.<sup>202</sup>

The date for the creation of the first ever bureau of distribution is contested. Hannaway claimed that the first bureau was that of Jacques Alleaume and Jean Delage, which opened in Paris in 1733.<sup>203</sup> Oger, for his part, argued that the first bureau was founded in 1682, also in Paris.<sup>204</sup> In my own work, I have found the outline of a project, drawn in 1686, for “a bureau where all the waters are counter-marked and stamped”.<sup>205</sup> This finding would corroborate Oger’s claim that such bureaus existed already in the seventeenth century.

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<sup>201</sup> Memoir for Antoinette Lacroix de Montauban, 109e assemblée, (7<sup>th</sup> September 1778), SRM 113, dossier 19, ASRM.

<sup>202</sup> See for example the widow Delpon, who took over sole ownership of the bureau upon the passing of her husband: Correspondence from Delpon to the *Société*, (1787), SRM 90A, dossier 2, ASRM. “je profiterai de votre décision, Monsieur, pour empêcher la vente d’aucunes eaux ailleurs que dans le Bureau qui m’est confié par la Société Royale. La douane de valeur n’a aucun titre nouveau pour accroître le fardeau de ses droits exorbitants sur de misérables eaux naturelles et médicinales : sur des bouteilles qui payent peut-être pour la trentième fois à leurs trentième passage. je ferai refuser aux sources d’accroissement qu’on me demande.”

<sup>203</sup> Hannaway mentions a bureau held by Jacques Alleaume et Jean Delage. Caroline C. Hannaway, “Medicine, Public Welfare and the State in Eighteenth Century France: The Société Royale de Médecine of Paris (1776–1793)” (Ph.D Johns Hopkins University, 1974), 228. Alleaume or his descendant was confirmed to be indeed in possession of the Paris bureau some years later. See Procès-verbal des commissaires envoyés chez Alleaume et Barrau, distributeurs des eaux minérales à Paris, (1772–1773), SRM 94, dossier 6, pièces 1–16, ASRM.

<sup>204</sup> Oger, *Les bureaux de distribution des eaux minérales aux XVIIe et XVIIIe siècles*.

<sup>205</sup> Projet pour éviter les falsifications, (1686), O/1/30, fol. 350, AN. “a M de la Reynie 29 octobre, Mr Daquin premier chirurgien medecin du Roy après avoir fait connoistre que beaucoup de gens qui se mestent de vendre des eaux minerales a Paris en donnent de falsifiées

Regardless of when the first one was inaugurated, it is clear that the number of bureaus expanded quickly in the course of the eighteenth century, also beyond Paris. Oger estimates that a total of forty-two bureaus existed for some period of time between 1682 and 1790. They were typically situated in small and medium sized towns. In 1773, there were twelve fully fledged bureaus, in the cities of Paris, Lyon, Toulouse, Montpellier, Nîmes, Marseille, Limoges, Plombières et Remiremont, Dijon, le Puy en Velay, Mâcon, and Bordeaux. In addition, there were slightly simpler versions of these bureaus in a further seventeen towns: Perpignan, Grenoble, Besançon, la Rochelle, Brioude, Valenciennes, Rodez, Metz, Strasbourg, Nantes, Carcassonne, Rennes, Brest, Lorient, Quimper, Montélimar, and Valence.<sup>206</sup> Some of these towns were small in population, which testifies to the popularity of bottled waters, and the widespread nature of the demand.

Figure 2.1 gives an idea of the repartition of the bureaus within the French kingdom, by showing the position of each active bureau in the year 1773.<sup>207</sup> The concentration of bureaus in Brittany is noteworthy, given that the region did not have many mineral springs of its own. There is also a clear void around Paris. It should be noted, however, that the map only shows bureaus open in 1773. More bureaus opened as early as 1774, as the popularity of mineral waters continued to grow.

The administration of mineral waters became more involved and documented towards the end of the century, for reasons that will be discussed in the following chapter. It should be noted at this stage that the extensive detail available on the 1770s and 1780s bureaus is not at all replicated for the prior decades. For the 1700–1770 period, only a sample of archives are available, meaning that the following discussion of the bureaus has to be based on the dynamics of the end of the century.

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et trompent le public a proposé a sa Maté d'establir un bureau ou toutes les eaux soient contre-marquées et cachettéex et. demande que tous les privileges accordez par sa Ma<sup>té</sup> et par luy mesme aux particuliers qui en distribuent soient revoquez suivant les memoires et projet de lettres patentes que je vous ennoye, sa Maté veut que vous examiniez le tout et que vous me fassiez scavoir vostre avix pour luy en rendre compte. Je suis/."

<sup>206</sup> The bureau of Fontainebleau was created in the same assembly which listed the existing bureaus, hence why it was not yet counted in the fully established bureaus of that year and does not appear on the map. Raulin, "Memoire contenant les Établissements fait par la Commission Royale de Médecine en ce qui concerne les Eaux minérales du Royaume", 37<sup>e</sup> assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM.

<sup>207</sup> See further detail about the legend and map creation in Appendix n°[9].



Figure 2.1 Map of the bureaux of distribution of mineral waters in France (1773). Map by author.

Many bureaux were created in the course of the eighteenth century, and continued operations into the 1770s, during which new regulations forced them to communicate with central institutions, making the bureau's activity easier to track. This was the case for the Lyon bureau, which received its permit in 1753.<sup>208</sup> The permit was granted to Pariot, a confectioner, yet in practice it was his wife who ran the water distribution. It appears that Pariot kept his job at the bakery in spite of his permit, explaining that the sale of mineral waters was not profitable enough. Evidently, he did not like having to spend money, since he got into trouble with the authorities later for systematically failing to pay his dues, but he seemingly always managed to avoid punishment.

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<sup>208</sup> Eaux, Bonnes fontaines, bouches d'arrosage, bouches d'incendies, installation, (1746), 743 Wp 065, Archives Municipales de Lyon, Lyon, (Subsequently abbreviated as AML); Dossier Lyon, (1773–1788), SRM 90A, dossier 2, pièces 1–26, ASRM.

Interestingly, it was said that he had the “fraudulent foresight” of organising a separation of goods between him and his wife with a notary, so that she could not be pursued for his outstanding debt.<sup>209</sup> Pariot in fact died before the debt could ever be collected, while his wife, thanks to her late husband’s “fore-sight”, escaped all retributions.

This case highlights the complex, even “fraudulent”, network of actors operating the trade of mineral waters. From the perception of those involved, it was a difficult trade with tight margins, which required a certain amount of resourcefulness and an ability to bend the rules in one’s favour. The sellers often worked in teams, either with their spouses or families, in order to divide the workload and make ends meet.

The profits made by individual bureaux can be glanced at periodically thanks to the fiscal information they sent to the regulatory agencies. The bureau of the very small town of Rodez for example made a net benefit of 627<sup>l</sup> in the year,<sup>210</sup> which once all transportation costs and other expenses were accounted for, left a measly 162<sup>l</sup> of profit for the bureau tenant.<sup>211</sup> This annual revenue was similar to that of a low paid worker. The bureau of Carcassonne in 1776 made an even lower profit of 74<sup>l</sup> in a half year, after taxes and expenses.<sup>212</sup> This bureau did a little better the following year however, with a benefit of 278<sup>l</sup>.<sup>213</sup> In the slightly bigger town of Nantes, the profit was also a little higher, at 685<sup>l</sup> for the year 1775.<sup>214</sup> These very low profit margins make

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<sup>209</sup> Minutes of the *Commission*, report on the lack of payment by Pariot, 86e assemblée, (20<sup>th</sup> January 1777), SRM 112, dossier 14, ASRM. “j’ai entretenu depuis ce tems la des correspondances avec m. le lieutenant de police de Lyon d’après plusieurs délibérations de votre compagnie pour faire effectuer ce payement. la bonne volonté du magistrat a toujours été traversée par des chicanes du Sr Pariot qui ne s’occupoit alors qu’à faire des fraudes dans le commerce des eaux minérales et à nuire au bureau de Lyon. il eut la prevoynance frauduleuse de faire une separation de biens avec ceux de sa femme, et se rendit par la en apparence insolvable la Com. Rle.”

<sup>210</sup> Throughout the thesis, I will be using the notation 3<sup>l</sup> 3j 3d in order to refer to 3 *livres*, 3 *sols* and 3 *deniers*. Those symbols were used in accounting documents, but the names of each subdivision were also sometimes typed in full. For the sake of uniformity, and clarity (in order to differentiate *livres* the currency from *livres* the weight), I will be using the symbols throughout. See Appendix n°[10] for further detail on all units used. On eighteenth-century units, see: Franck Jedrzejewski, *Histoire universelle de la mesure* (Paris: Ellipses, 2002).; John J. McCusker, “Les équivalents métriques des poids et mesures du commerce colonial aux XVIIe et XVIIIe siècles,” *Revue française d’histoire d’outre-mer* 61, n°224, no. 3 (1974).

<sup>211</sup> “Du produit de différentes especes deaux minerales vendues par le sieur garrigou entrepreneur de la distribution desdites eaux a rodez Rouergue”, (1776–1777), SRM 113, dossier 5, ASRM.

<sup>212</sup> “Etat du produit des differentes especes d’Eaux Minerales Vendues par le Sr Philippe Moulis entrepreneur de la distribution des dites Eaux au Bureau de Carcasonne”, (1<sup>st</sup> January 1776–30<sup>th</sup> June 1776), SRM 113, dossier 5, ASRM. “Benefice net distraction faite des fraix.....74”2s”.

<sup>213</sup> Ibid, “Benefice net distraction faite des fraix cy... 278”11s.”

<sup>214</sup> “Etat du produit des differentes especes d’Eaux Minerales Vendues par Lafiton md Apothicairaire entrepreneur de la distribution des dites Eaux à Nantes en Bretagne”, (1<sup>st</sup> July 1775–31<sup>st</sup> December 1775), SRM 113, dossier 5, ASRM. “Benefice net six cent quatre vingt cinq livres six sols sis deniers.”

it not unlikely that some of the tenants had other activities alongside the bureau. Like Pariot who left the mineral water bureau for his wife to manage, other bureau tenants most likely had similar dual arrangements in order to earn a living.

The purpose of a bureau of this kind and the reason why they persisted was to simplify the trade for the buyers. By buying bottles at the bureau, all of the complexities of transport, the need to be updated on the evolutions of import taxes or the regional variation in pint sizes were removed. With the system of the bureaus, it fell on the tenant to find reliable transporters and make sure that they brought good quality waters, in a good enough variety. The number of bureaus shows that a significant portion of water consumers were willing to pay for the convenience. The possibility of hearing some advice on the waters that would be best suited to them was also likely an advantage. Bureau tenants were not supposed to give medical advice, as this was the privilege of physicians. But apothecaries often broke that rule, and the water sellers, who were often apothecaries themselves, sometimes prescribed waters, a practice which was decried by physicians but convenient to buyers.<sup>215</sup> These bureaus endured by gaining the trust of their customers, which was done by conforming to regulation, but also by skirting around them from time to time in the interest of their buyers.

*Putting bottles on mules, carriages, and boats: solving a logistical puzzle*

The large number of bureaus, located in a variety of towns, indicates that the waters sold in them had to be affordable. A major factor in the price of any merchandise was obviously the cost of transport itself. Transport was either made on land, or via waterways. Ground transport was made using horse-drawn carriages, or else mules, when the roads were too narrow. The eighteenth century, and especially the reign of Louis XV, saw an improvement in the quality of the roads, in part due to the institution of the *Corvée des Chemins*.<sup>216</sup> This had many consequences for the transportation of people and goods, but one of them was that the circulation of mineral waters on the French territory became much more feasible, and more profitable thanks to the larger quantities that could be carried at once. Research suggests that thanks to the

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<sup>215</sup> The medical literature on mineral waters was also likely to empower patients to purchase mineral waters themselves, without consultation with a physician. See for example the book by Buchan which recommended the waters of Balaruc in a number of cases: Guillaume Buchan, “Médecine domestique ou traité complet des moyens de se conserver en santé, de guérir et de prévenir les maladies, par le régime et les remèdes simples,” (A Paris, Chez Froullé, Libraire, Pont Notre-Dame, vis-à-vis le Quai de Gesvres, 1792), 54. “Art III. Des chancres non vénériens, Cause; la mal-propreté. Remesdes; la propreté, Eaux de Balaruc”.

<sup>216</sup> Anne Conchon, *La corvée des grands chemins au XVIIIe siècle* (Presses Universitaires de Rennes, 2016); Denis Woronoff, ed., *La circulation des marchandises dans la France de l’Ancien Régime* (Paris: Comité pour l’Histoire Économique et Financière de la France/LGDJ, 1998); Guy Arbellot, “La grande mutation des routes de France au XVIIIe siècle,” *Annales, Économie, Société, Civilisation* 28, no. 3 (1973).

better conditions of the roads, the *rouliers*, the people who conducted the carriages, were able to go from 3,000 to 5,000 pounds in load, with no further reinforcement of the cart.<sup>217</sup> This would have significantly helped the transportation of waters, which were heavy due to the weight of the water and the bottles that encased it.

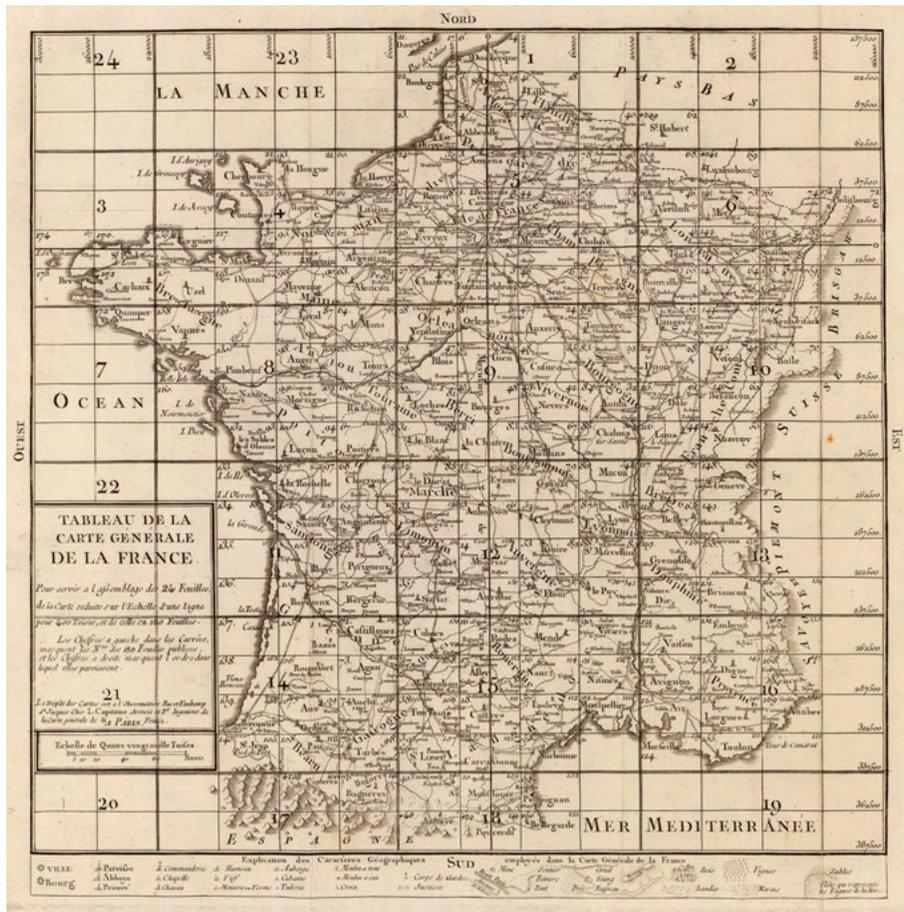


Figure 2.2 Cassini’s map of France (1797). The map indicates the main roads and canals that were available for the transportation of goods in the late eighteenth century. Cassini de Thury, Public domain, via Wikimedia Commons.

<sup>217</sup> Sandrine Robert and Nicolas Verdier, “La route en train de se faire,” *Les Nouvelles de l’archéologie* 115 (2009).; J. Letacounoux, “Les transports en France au XVIIIe siècle,” *Revue d’histoire moderne et contemporaine* 11, no. 2 (1908)., 109.

Ground transportation was severely hindered during the winter months. This was not a decisive obstacle for the waters, however, since other limiting factors restricted the sale to the warmer months. Another factor of imbalance was the distribution of roads on the territory, as France was, and still is, organised with Paris as the central node. Already in the eighteenth century, there were plenty of fast, well-tread roads, transportation services, and dedicated tradesmen who brought goods in and out of the capital. Transporting goods from Geneva to Bordeaux was a different matter.<sup>218</sup> This means that the Parisian bureau of distribution had access to a much larger network of transporters, and to faster travel times than other towns (see Figure 2.2).

In some cases, the waters were also carried by boat.<sup>219</sup> Waterways saw large transformations during the early modern period. Antoine Beyer, in his paper tracing the most important milestones of the history of navigable ways in France, describes the seventeenth and eighteenth centuries as a time of the “junction policy”.<sup>220</sup> These junctions were canals that linked major rivers, allowing for a much broader network of uninterrupted waterways, which could be used to transport both goods and people.<sup>221</sup> Many ambitious attempts to reform them took place during the eighteenth century, in an bid to create more fluid circulation on the territory by making it partially free from local privilege, and constant tolls. It was however extremely difficult to revoke these centuries-old privileges.<sup>222</sup> For mineral waters, the waterways were a mean of transport which alleviated the issue of weight. While a regular carriage could transport bottles of waters in the dozens, a boat could take hundreds. In an example from 1776, a boatwoman from Trier was carrying 800 jugs of waters on her barge, which she transported and sold in France’s eastern cities.<sup>223</sup> This allowed for very cheap transport, especially when it was done by the boatmen and women themselves. However, the lack of unification of the waterways and the resulting heavy taxation did place significant restrictions on this kind

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<sup>218</sup> Jean-Pierre Poussou, “Sur le rôle des transports terrestres dans l’économie du Sud-Ouest au XVIII<sup>e</sup> siècle,” *Annales du Midi : revue archéologique, historique et philologique de la France méridionale* 90, n°138–139 (1978).

<sup>219</sup> This was the case particularly in Metz and in Vichy. Metz, 74<sup>e</sup> assemblée, (1<sup>st</sup> April 1776), SRM 112, dossier 3, ASRM.; Tardy, “Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.”, 21.

<sup>220</sup> Antoine Beyer, “Les grands jalons de l’histoire des voies navigables françaises,” *Pour mémoire, revue des ministères de l’environnement, de l’énergie et de la mer* 17 (2016), 6. See map on page 6, “La politique des jonctions”.

<sup>221</sup> The ambitious realisation of the Canal du Midi was one of these junctions. Made between 1666 and 1681, it connected Sète and the Mediterranean to Toulouse, which itself was connected to the Atlantic Ocean through the Garonne river. René Gast, *Le Canal du Midi et les voies navigables de l’Atlantique à la Méditerranée* (Rennes: Éditions Ouest-France, 2000).

<sup>222</sup> On the management of navigation in the French eighteenth century, see: Éric Szulman, *La navigation intérieure sous l’Ancien Régime* (Rennes: Presses Universitaires de Rennes, 2014).

<sup>223</sup> “Plainte écrite au sujet de ceux qui ne suivent pas les ordres du roi et font acheminer des eaux minérales sans autorisation”, 72<sup>e</sup> assemblée, (26<sup>th</sup> February 1776), SRM 112, dossier 1, ASRM. “La nommée Lautrebourg Batteliere de treves ayant conduit sur ses batteaux la quantité de huit cent cruchons d’Eaux mineralles en cette ville”.

of transportation. In addition, many mineral waters came from the south-west of France, and this region was not well connected to the north, via the waterways, mostly because of the mountainous regions of central France. Consequently, transportation by boat was done when possible, but for many springs, it was not an option.

*Avoiding breakages and alterations: the question of containers*

The waters themselves were carried in different kinds of containers. Early in the eighteenth century, they were sometimes transported in barrels.<sup>224</sup> The advantage of a barrel was that it was light, and relatively solid. It was believed however to alter the properties of the waters. In order to ensure the all-important trust in the transported water, most towns had to comply with the suggestion of physicians, which was to carry the waters in bottles.<sup>225</sup> The bottles could be made out of sandstone, in which case they could carry several pints worth of water.<sup>226</sup> Another choice was to use a Dame Jeanne, a rounded glass bottles with a narrow neck, commonly wrapped in wicker, able to store roughly forty pints worth of liquid, making them quite heavy. Once they reached the bureau, their contents were decanted into smaller bottles for sale. Although this was convenient for transportation, because the Dame Jeanne could be reused, and the glass did not contaminate the water, the rebottling at the bureau meant that fizzy waters lost a lot of their gas upon arrival. For the most delicate of waters, the transport had to be made directly in consumer-ready glass bottles. When gas was involved, the bottles usually received a double seal, with both wax and tar, to make sure that no air could escape. These individual bottles ensured that the patients drank waters that were in many ways similar to the ones at the spring, but this way of transport was also more expensive, and had a higher propensity for breakage.

Bottles breaking was in fact a common problem, which could cause spikes in prices, or shortages of a particular water at a bureau.<sup>227</sup> Breakage could occur because of a few different reasons. A lot of the transported waters were fizzy, and therefore capable of bursting bottles when shaken.<sup>228</sup> Since shaking was inevitable on the long road to the bureau, some bottles were often lost to

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<sup>224</sup> Tardy, "Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.", 24.

<sup>225</sup> Glass was considered the best possible material for the bottles, because it did not interact with their contents. It was the same reason that made glass the ideal material for chemical instruments.

<sup>226</sup> The waters of Merlange were carried to Paris in such bottles. The sandstone bottles contained 4 pints each, and were taken twenty-four at a time in a trip. Eaux de Merlange, 29e assemblée (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM.

<sup>227</sup> "Tableau des eaux minérales distribuées à Paris", 11e assemblée, (11th December 1772), SRM 111A, dossier 9, ASRM. "On a augmenté dans ce tableau le prix [illisible] des eaux arrivées à Paris de 6 sols par pinte pour tenir lieu de déchet resultant de la casse de la casse des bouteilles dans le transport."

<sup>228</sup> Eighteenth-century glass was not as solid as the glass bottles of our time. It was therefore recommended to leave a gap when filling the bottle, in order to minimise stress on the glass.

the trip. Differences in temperature could also result in bottles bursting. The waters of Sultzmatt for example, were known to expand when heated, and to cause breakages that way.<sup>229</sup> Ice was of course also an enemy of glass, and an unexpected frost had the potential to ruin an entire batch of waters.

In addition to the issue of breakage, the water itself could sometimes not survive the trip. Spa intendants often complained about their waters losing in quality when transported and urged people to come take them fresh from the spring instead. While their credibility was somewhat diminished by an obvious conflict of interest, it should be said that this was in fact a scientific consensus. Eighteenth-century chemists, apothecaries and physicians, all agreed that mineral waters were an unstable product, which often ‘turned’ when transported.<sup>230</sup> There are dozens of examples in which analysts of mineral waters expressed this opinion. But the analysts were not the only ones who were aware of this. The bureau tenants, who had a strong incentive to keep as much of their stock in good quality as possible, knew that they sometimes received water that was already past due. One local seller explained for example that the Balaruc bottles that he received were “almost all corrupted”.<sup>231</sup> This consensus was well-summarised by the physician Cantwell, who claimed in his work on the waters of Passy: “Everyone convenes that the Waters lose something, or suffer some alteration in transport”.<sup>232</sup> This was not an exaggerated statement, since physicians, chemists, sellers and inspectors all seem to have agreed on this point.<sup>233</sup> It also means that most physicians who prescribed patients transported mineral waters were aware of their slightly ‘altered’ quality. By extension, a portion of the public was also likely aware of this fact, and still chose to drink transported waters, likely because the alternative was not available to them.

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<sup>229</sup> M. J. A. Méglin, “Analyse des eaux minérales de Sultzmatt en Haute Alsace,” (de l’imprimerie Jean Henri Heitz, Impri. de l’Univ., 1779), 10.

<sup>230</sup> Massie noted that the waters could be conserved for a long time, but that a few bottles occasionally went bad and took the smell of hatched egg. He specified that this property was not due to any malpractice in transport. Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

<sup>231</sup> “Du produit des différentes espèces d’eaux minérales vendues par moy antoine garrigou entrepreneur de la distribution des eaux à Rodez”, (1<sup>st</sup> July 1775–1<sup>st</sup> January 1776), 95<sup>e</sup> assemblée, (1<sup>st</sup> September 1777), SRM 113, dossier 5, ASRM. “Balaruc, presque toutes gattees”.

<sup>232</sup> Andrew Cantwell, “Analyse des nouvelles eaux de Passy,” (A Paris, Chez Delaguette, Libraire & Imprimeur, rue S. Jacques, à l’Olivier, 1755), 1. “Plusieurs personnes ont déjà fait l’analyse des Eaux Minérales ; mais c’étoit probablement sur les lieux. Tout le monde convient que les Eaux perdent quelque chose, ou souffrent quelque altération dans le transport, & c’est cette réflexion qui m’a donné envie d’en faire l’analyse dans cette Capitale, où j’ai souvent occasion de les ordonner.”

<sup>233</sup> I am insisting a little on this particular point because the idea that the chemists of the eighteenth century ignored the instability of waters has been made rather strongly by Christopher Hamlin, in a book which admittedly centres on nineteenth-century mineral waters. When describing the eighteenth century, Hamlin claims that because chemists were unaware of the instability of mineral waters, their analyses were necessarily flawed, and inconsistent results were incomprehensible to them, which is inaccurate. Hamlin, *A Science of Impurity, water analysis in nineteenth century Britain*, 23.

The last issue worth a mention was the much famed and much decried “infidelity” of the transporters.<sup>234</sup> Obviously, there was no way of controlling every aspect of what transporters did with the waters they took. A certificate obtained from the intendant at the spring could not hinder transporters from selling the genuine waters to buyers on the road, and refilling the bottles with fake mineral waters that were then given to the bureau. A common complaint was that transporters took the waters at the wrong place, possibly to avoid having to pay a tax on the filling of their bottles. They were accused by various town physicians to fill their bottles in any local fountain, or in the river instead of the official spring.<sup>235</sup> With these complaints however, it is hard to discern truth from fabrication. The physicians often complained in angry pamphlets about the infidelity of servants, who only tried to extort their employers by working out ignominious deals with equally untrustworthy transporters.<sup>236</sup> This was likely a largely exaggerated, if not outright fictional problem, or possibly a fear-mongering tactic meant to dissuade people from buying transported waters in favour of coming to the spring.<sup>237</sup>

#### *The consequential size of the mineral water market*

It is difficult to give an exact figure regarding the size of the mineral water market. The large number of bureaux gives an indication, but precise figures on the annual sale of waters are unfortunately hard to obtain. Only occasional indications can give a suggestion of the kinds of volumes involved. An example is the bureau of Dijon, which in 1773 paid 200<sup>l</sup> a year for its permit, indicating its modest size. A surviving inventory produced in the same year by the

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<sup>234</sup> See for example: Raulin, “Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangères”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. “art 19eme, pour Eviter les fraudes et les infidelités qui pourroient se commettre dans le puisage et l'envoi des Eaux, les medecins Intendants, et en leur absence les autres officiers veilleront à ce que les vües de Sa Majeste soient exactement remplies”.

<sup>235</sup> Jaulhac explained that some transporters filled their bottles at the river instead of the fountain, which hurt the reputation of the mineral waters. Correspondence from Jaulhac to Lassone, (1788), SRM 90 A, dossier 4, ASRM.

<sup>236</sup> See an example of this rhetoric in: Raulin, “Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangères”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. “Le Roy Etans informé des désordres qui se commettent aux différentes fontaines minérales du Royaume du dépérissement de la plupart de ces fontaines, du service peu exact, irrégulier, peu fidele et malentendu qui sy fait par les medecins chirurgiens et apotocaires établis auprès des Eaux, et par les domestiques qu'on y attache au service des malades; du charlatanisme qui s'y exerce; du peu déxactitude qui regne dans certains bureaux établis par la commission royale en différentes villes du royaume, des fraudes qui se commettent dans le commerce et la distribution des Eaux minérales autans de france qu'Etrangères, malgré la disposition de la déclaration du 25 avril 1772 et l'arrêt du conseil du 1er avril 1774 et au grand préjudice du public;”.

<sup>237</sup> Tardy's often cited pamphlet on the subject is full of these kinds of accusations. Tardy, “Dissertation sur le transport des eaux de Vichy, avec la manière de se conduire avec succès dans leur usage.”, 5 –25.

bureau tenant, the physician Dechaux, lists the seven kinds of waters he stocked (see Figure 2.3).

Dechaux included three columns in his document, listing how many bottles he had bought, how many he sold, and how many remained in stock. His best-selling water came from the foreign spring of Sedlitz, of which he had sold 397 bottles. Along with the waters of Seydschutz, German waters were very popular on the French market. His second best-selling water and largest order originated from the spring of Balaruc, with 335 bottles sold. It appears that all sales listed had been done in the past year, as otherwise he would have likely been made to get rid of the out-of-date stock. In total, he had sold 1,149 bottles in the past season, or since taking over from the previous owner, which gives an indication of the volume of water sales in a small town.<sup>238</sup> Assuming that each patient had to buy three bottles in order to be cured of their illness, this meant that throughout the year, the Dijon bureau tenant saw 383 buyers, barely more than one each day.

Etat Des eaux.

Achats	Vendus	reste a vendre
Balaruc 735	335	400
Salz 349	69	280
Cransac 160	42	118
Lamotte 167	72	85
Plombieres 290	31	256
St. Priest 960	200	760
Sedlitz 567	397	170

Figure 2.3 “State of the waters” in the Dijon bureau (1773). The three categories state which bottles were: “purchased” - “sold” - “remaining to be sold”. (SRM 111A, dossier 20, ASRM). © Bibliothèque de l’Académie nationale de Médecine (Paris)

<sup>238</sup> Engagement de Dechaux, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM.

In the bureau of Valenciennes, which was one of the smaller bureaux, a comparable estimation of the stock also exists for the period 1773–1775. Valenciennes, a small town situated right on the border to the Flanders, was closer to Brussels than to Paris, which explains why its best seller was the nearby water of Spa. The bureau only sold two other kinds of waters, those of Selz and Vichy. Over two years, the tenant sold 2,315 bottles, 1,542 of which were from Spa, making its annual sales comparable to those of the Dijon bureau.<sup>239</sup>

In Paris, the most frequented bureau of the country, the sales volume was unsurprisingly higher. I regrettably have not found a full record of the orders that Arnaud, the bureau tenant, placed. But an accident that he incurred gives an indication of the kinds of quantities that he dealt with on a regular basis. In 1775, he ordered some Vichy water in November. Because of an unexpected frost, the entire stock was lost to the cold weather. Arnaud explained that he had, on this unfortunate occasion, lost 1,592 pints of Vichy waters, in addition to 388 pints from the Vals spring, and 100 from Forges which were all on the same carriage.<sup>240</sup> This was a single order for Arnaud, and one that was very late in the season. In addition, it only took him about a week to get a second delivery in, and to be able to serve his customers, who were reportedly upset at the delay. This volume indicates the sophistication of the water trade's logistics. The waters could be ordered and carried by the thousands on short notice, and a single week of hiatus meant that Arnaud had to justify himself to the authorities for his failings to provide Vichy waters to angry buyers. This demonstrates that the market of mineral waters was far-reaching and seen as a necessity by an important portion of the urban public.

These examples give snapshots of what the quantities looked like for certain points in time. It is however difficult to get an accurate representation of the variations in these quantities from one decade to the next. To give a rough estimate of potential variations, a few bureaux sent accounting documents for different years, giving a rare sighting of differences in the yearly sale of mineral waters. One example is offered by the bureau of Rodez, for which surviving documents record the state of its stocks for two consecutive years. While the numbers are difficult to compare, since they concern different monthly periods – one being for a year, the second for about half a year – they nevertheless indicate some trends. In the second half of the year of 1775, the bureau stocked seven different waters, all while it sold ninety-three bottles and 3,098 pounds of waters (presumably in barrels, or larger containers); the best-selling

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<sup>239</sup> “Etat du produit des différentes especes d'eaux minérales vendues par Jean François Ravestin entrepreneur de la distribution de dites eaux à Valenciennes”, (18<sup>th</sup> May 1763–8<sup>th</sup> June 1775), 75<sup>e</sup> assemblée, (6<sup>th</sup> May 1776), SRM 112, dossier 4, ASRM.

<sup>240</sup> Correspondence from Arnaud to the *Commission*, 64<sup>e</sup> assemblée, (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM. “je ne refuse jamais d'eau de vichy, il y a cependant une circonstance malheureuse à excepter s'en est manqué totalement pendant huit jours les Gellées du mois de novembre dernier m'en ont fait perdre deux milles cinq cents quatre vingt douze pintes de vichy, trois cents quatre vingt huit de vals, et cent de forges”.

water was that of Cransac.<sup>241</sup> For the year 1776, the bureau sold 151 bottles, and 2,200 pounds of non-bottled water, showing an overall decrease in sales. The best-seller water was still that of Cransac, yet in that year the bureau only offered six different waters, no longer stocking the water of Cauterets.<sup>242</sup> The bureau tenant (or “entrepreneur” as he called himself), explained that the relentless rain of the past year was to blame for the low traffic in his bureau.<sup>243</sup> The two inventories reveal, however, an uneven variation in sales. The waters of Vals stayed remained constant, at thirty bottles for one year, and thirty-two the next. The waters of Barèges however jumped from ten bottles in 1775 to fifty-nine in 1776. This kind of variation over time was likely the result of changes both in supply and in demand. While the chain of transportation could suffer issues, the demand was also dependent on the kinds of waters that the local doctors decided to prescribe. While a particular illness was on the rise, doctors could be more likely to encourage the purchasing of specific types of waters, thus further altering demand outside of the control of both bureau tenants and spa administrators.

## Pricing the bottle

Eighteenth-century transports were costly, and the expenses began right at the beginning of the chain. Even without factoring the costs associated with travel and accommodation, extracting spring waters incurred costs. When the spring belonged to a municipality, the municipality sometimes made expenses towards the upkeep of a fountain, which they used to justify putting a small fee on the waters. The waters of Vaugirard were for example sold directly from the owner’s garden to the public. A 1770 permit stated that their price could not exceed 8] a pint, when sold on property.<sup>244</sup> This was expensive when

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<sup>241</sup> Antoine Garrigou sold ninety bottles, 3098<sup>fr</sup>. The waters he stocked were those of Cransac, Cauterets, Vals, Balaruc, Yeuzet, Barèges and Camares. “Du produit des différentes espèces d’eaux minerales vendues par moy antoine garrigou entrepreneur de la distribution des eaux à Rodez”, (1<sup>st</sup> July 1775–1<sup>st</sup> January 1776), 95e assemblée, (1<sup>st</sup> September 1777), SRM 113, dossier 5, ASRM.

<sup>242</sup> Antoine Garrigou sold 151 bottles, 2200<sup>fr</sup>. The waters he stocked were those of Cransac, Barèges, Camares, Balaruc, Yeuzét, Vals. “Du produit de différentes especes deaux minerales vendues par le sieur garrigou entrepreneur de la distribution desdites eaux a rodez Rouergue”, (1<sup>st</sup> January 1776–1<sup>st</sup> January 1777), 95e assemblée, (1<sup>st</sup> September 1777), SRM 113, dossier 5, ASRM.

<sup>243</sup> Correspondence from Garrigou to Nogaret, 95e assemblée, (1<sup>st</sup> September 1777), SRM 113, dossier 5, ASRM. “la consommation des eaux na rien valu lan passé la quantité de pluyes a fait que presque personne nen a demandées ce qui fais que le produit est tres modique”.

<sup>244</sup> Le Meunier (sieur), “lettres patentes confirmant l’autorisation donnée par le sieur Senac, Premier Médecin du roi, au S Meunier a l’effet de pouvoir distribuer les eaux minerales de son jardin à Vaugirard”, (10<sup>th</sup> November 1770), O/1/116; fol. 1109, AN. “nous avons en consequence permis et permettons au S le Meunier de vendre et distribuer l’Eau de la source de son jardin de Vaugirard pourvü que le prix n’Excède pas celui de 8s la pinte”.

compared to the waters of Passy, which when transported to Paris, only cost 6].<sup>245</sup> Another example from 1777 were the waters of Saint Martin which were sold at the spring for 2] a pint, but provided to the poor for free.<sup>246</sup> Similarly, a water found in the suburbs of Clermont around 1783 was handed out for only 1] a pint, and given for free to the poor.<sup>247</sup> It appears as though some owners started to realise that they could make a profit out of their own garden if a spring happened to come out there. One water analyst described how a very popular spring in Saint Malo had been discovered by a rich individual who knew how to take advantage of this good fortune.<sup>248</sup> For the business-minded, there was money to be made from mineral waters.

The other main cost at the spring was the use of the showers or baths. Those required the labour of the *baigneurs* and *baigneuses* (men and women workers). Filling the tub or the shower bucket, and assisting the patient before and after the bath, were services provided at a cost. At the waters of Bourbon-Larchambault, in 1778, the prices were as follows:

each bath will be paid twenty sols, the showers will be paid the same price unless the patients need two bathers [*baigneurs*] or two showerers [*doucheurs*] in which case they will be paid thirty sols. [The patients] will give five sols for each day of drinking the waters of bourbon or of jouas.<sup>249</sup>

In addition, they may be obliged to pay for the services of the *baigneurs*, which was relatively expensive when compared to solely drinking the waters. In so far as gratuities were generally expected, the price could surpass the announced 20].

#### *Unstable conditions and their effects on prices*

The prices at the spring were generally stable, because they mostly depended on the cost of labour, in addition to the cost of building and maintaining the facilities. The price of transported waters was, by contrast, the result of more complicated calculations. For a bottle to reach its destination, a variety of costs were involved. Major costs included bottling, shipping, taxes and tolls, as well as the profits expected by the various people involved.

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<sup>245</sup> Poster on the prices of waters in Paris, (not dated, likely ca. 1778), SRM 95, dossier 1, ASRM.

<sup>246</sup> Minutes of the *Commission* on the waters Saint Martin, (1777), SRM 92 B, dossier 39, ASRM.

<sup>247</sup> Bossin noted that the waters of the suburbs of Clermont were being sold for 1] and given for free to the poor. Correspondence from Bossin to the *Société*, at the Mont d'Or, (1783), SRM 90 A, dossier 4, ASRM.

<sup>248</sup> Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM.

<sup>249</sup> "Règlement proposé pour les eaux minérales de Bourbon-L'Archambault", 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. "chaque bain serâ payé vingt sols, les douches se payeront le même prix à moins que les malades n'aient besoin de deux baigneurs ou deux doucheurs dans ce cas elles seront payées trente sols. on donnerâ pour chaque jour de boisson des eaux de bourbon ou de jouas cinq sols."

Studying the prices of the transported waters can reveal a lot about what factors mattered in the price of the water. To what extent was the consumer price influenced by supply and demand? Was reputation a factor? To what degree was distance decisive? While it is hard to give exhaustive answers to these questions for the entire time period, after the 1772 creation of the *Commission*, bureau tenants began to submit lists of prices to the new institution, which sometimes included a breakdown of the factors involved in pricing.<sup>250</sup> These sources are critical in evaluating the state of the bottled water market.

Ravestin, a distributor of waters in Valenciennes, described in 1776 some of the reasons for the recent price fluctuations in his shop.<sup>251</sup> First of all, while the waters were officially supposed to be at a fixed price at the spring, he claimed they were not, which ate into his margins. The import of waters from Spa in the Liège region, for example, caused issues at customs. Boat transporters demanded last minute fees, occasionally leading to unexpected increases in costs. While it is hard to evaluate Ravestin's claims, it is clear that many hands were involved in the transport of a water: from the people at the spring to those involved in transporting the waters to the river, in addition to those loading the cargo onto the boats, and so on, until the waters reached the bureau. At every step, the process was susceptible to disruptions, and at times deceit. A bottle could disappear here and there, or be subjected to an unexplained raise in price, for no evident reason. These small bends in the rules amounted to larger differences for the bureau tenant at the end of the chain.

Because of these factors, the price of the bottle was bound to reflect a few different forces. Although in order to fully understand the forces that applied onto the trade throughout the period, one would need to make an extensive dedicated study, it is still possible to see some of the factors of influence by studying and comparing a few different price lists from different bureaus. By averaging all of the prices and the volumes involved to an easily comparable price per pint, it becomes possible to gauge, at least for the 1770s, which waters were more expensive, and if that price difference was due mainly to transport, reputation, or some other factor.

### *Taxes, tolls, and transport*

On their way to the bureaus the waters were subject to the incompressible cost of taxes. Specialists on trade in early modern France seem in agreement that commerce was severely inhibited by taxation, tolls and other punctual costs of that nature. The monarchy's central taxation agency, the *Ferme générale*, did little to facilitate trade, by always securing its revenues first.<sup>252</sup> Beyond the central agency, those who were entitled to various privileges defended them

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<sup>250</sup> See chapter 3.

<sup>251</sup> Correspondence from Ravestin in the bureau of the Flandres to the *Commission*, 79e assemblée, (6<sup>th</sup> August 1776), SRM 112, dossier 7, ASRM.

<sup>252</sup> Woronoff, *La circulation des marchandises dans la France de l'Ancien Régime*, 4.

with enough might to prevent serious economic reform. This resulted in many tariffs which slowed the market.<sup>253</sup>

This had direct consequences on the commerce of waters. When it came to cross-border transport, the containers mattered all the more, because the different kinds of bottles were taxed differently. For example, the glass bottles protected with wicker weaving were taxed at 5% of their value, which increased the cost of using these materials.<sup>254</sup> The directors of bureaus often complained that different taxations associated with the weight and materials used made the waters, especially the “foreign” ones,<sup>255</sup> excessively expensive.<sup>256</sup>

Les eaux minérales payent de droit d'entrée par cent ...	The mineral waters pay as entry fee per one hundred ...
1*12s3d	1*12s3d
scavoir	namely
1° pour la ferme general ..... 2f	1° for the central tax office ..... 2f
2° officiers plancheurs ..... 4f	2° planning officers ..... 4f
3° officier gardes nuit ..... 3f	3° night guard officers..... 3f
4° don gratuit regi par la ville ..... 10f	4° gratuitous donation managed by the city..... 10f
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19f	19f
1er vingtieme de l'hopital ..... 1f	1st twentieth of the hospital ..... 1f
2e vingtieme ..... 11f	2nd twentieth..... 11f
droits de garre et hallage ..... 2a	parking and hauling rights ..... 2a
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1*2f11d	1*2f11d
4 sols pour livre de la ferme generale..... 4f 7d	4 sols for pound of the general tax office..... 4f 7d
doublement pour le compte du Roi	doubly for the count of the King
et de la ferme générale..... 4f 7d	and the general tax office..... 4f 7d
Total pour 100 pesant d'eau minérale..... 1*12f1d	Total for 100 weight of mineral water..... 1*12f1d

Figure 2.4 Taxes on the entry of mineral waters into Paris (1772). (SRM 111A, dossier 10, ASRM).

Figure 2.4 lists the different taxation points that applied to waters imported into Paris, revealing the complexity of the tax system.<sup>257</sup> Although the total

<sup>253</sup> Anne Conchon, *Le péage en France au XVIIIe siècle: Les privilèges à l'épreuve de la réforme* (Vincennes: Institut de la gestion publique et du développement économique, Comité pour l'histoire économique et financière de la France, 2013).

<sup>254</sup> Correspondence from Ravestin in the bureau of the Flandres to the *Commission*, 79e assemblée, (6<sup>th</sup> August 1776), SRM 112, dossier 7, ASRM.

<sup>255</sup> ‘Foreign’, (*étrangères*), referred to waters coming either from a different country or sometimes a different region. In terms of taxes, leaving one’s region meant more expensive transport.

<sup>256</sup> Correspondence to the *Commission*, 29e assemblée, (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM. “La charte acuelle des Denrées fait que les frais de voiture et le verre augmente beaucoup le prix des eaux étrangères qui nous arrivent par St flour ou Le puy”.

<sup>257</sup> Minutes of the *Commission*, on the rights of entry in Paris, 12e assemblée, (16<sup>th</sup> December 1772), SRM 111A, dossier 10, ASRM.

sum to be paid, at 1<sup>n</sup>12] 1d, does not appear excessively high – a cargo of 100 pounds of mineral waters would be worth a lot more than that – it is important to remember that these taxes only concerned the entry into Paris. Most waters had to go through other tolls on their way to the capital.

Around the same time, the intendant of the waters of Merlange, a small town in the south-east of Paris, calculated the amount to which taxes would affect the price of his waters in Paris. He explained that the custom was to send twenty-four bottles of four pints each to Paris with each transport. This would have weighed about 200 pounds for the water alone.<sup>258</sup> It appears, however, that he had struck some kind of agreement with the tolls office not to weigh the cargo, and that he instead would pay an advantageous flat rate of 2<sup>n</sup> 10] (it is unclear whether or not he had to pay taxes on the weight of the bottles).<sup>259</sup> He then went on to list all the remaining costs associated with export. The journey between Merlange and Paris cost 5<sup>n</sup> 8] with the waters, and the empty baskets on the return journey cost a little less, at a price of 2<sup>n</sup>. The bottles themselves were surprisingly expensive, accounting for more than transportation at 7<sup>n</sup> 7]. All in all, this amounted to 3] 6<sup>1/2</sup>d per pint of expenses for the distributor at Merlange (see Figure 2.5).

Interestingly, this document was written up after that distributor had been summoned by the regulatory institution to start using glass bottles instead of the sandstone bottles he had been using thus far. Glass bottles were believed to be more suitable for mineral water export, but they were also more expensive. The intendant therefore accounted for all the changes in price that this switch would imply. All in all, this would bring the new total at 3] 6d per pint of expenses.

	<b>Expenses when using sandstone bottles.</b>	<b>Expenses when using glass bottles.</b>
<b>Entry fees to Paris</b>	2 <sup>n</sup> 10]	7 <sup>n</sup> 7]
<b>Transport to Paris</b>	5 <sup>n</sup> 8]	5 <sup>n</sup> 8]
<b>Return trip to Merlange</b>	2 <sup>n</sup>	2 <sup>n</sup>
<b>Bottles</b>	7 <sup>n</sup> 4]	24 <sup>n</sup>
<b>Net expenses</b>	17 <sup>n</sup> 2]	38 <sup>n</sup> 15]
<b>Total per pint</b>	3] 6 <sup>1/2</sup> d	8] 1d
<b>Price for the buyer in Paris</b>	6] 6d	11] 1d

Figure 2.5 Expenses incurred in shipping the waters of Merlange to Paris.

<sup>258</sup> One pint corresponds to roughly one litre. A pound corresponds to about half a kilogram. See Appendix n°[10] on eighteenth-century units.

<sup>259</sup> According to the tax rates listed above, 200 pounds of waters should have cost 3<sup>n</sup> 4] 2d.

By doing these calculations, the distributor showed that the change in container would reflect directly on the buyers, who would have to pay almost double the price for the same water. He did add that at least, patients would get to keep the bottle. Interestingly, the report on his calculations mentioned that the waters of Merlange were “of little consequence”, implying that they did not have a high mineral content, or a far-reaching reputation. In this regard, keeping the sandstone bottles might not be too detrimental to the water’s contents.<sup>260</sup> The report implied that if the regulators decided to be uptight about the glass bottle rule, then the waters would have to be more expensive, without gaining much in quality. This is a rare case in which a seller used the lack of reputation of his waters in order to market them. Since the spring of Merlange was ‘inconsequential’, it could be transported using the cheaper alternative, thus appealing to the less wealthy buyers.

*Selling the same water across the kingdom: comparing prices in Paris, Lyon, Fontainebleau, Marseille and Brioude*

The different factors of influence, the tolls, the transportation costs, the price of the waters themselves, affected the ability of sellers to have certain springs in their bureaus. Because there were dozens of bureaus in the kingdom and close to a hundred different springs of interest in the time period of interest, it would not be possible to study the path and cost breakdown of each and every one of these springs. Never mind the computing power, such detailed archives are simply not available. I do, however, have access to the price lists of five different towns between 1773 and 1783, namely Paris, Lyon, and Marseille, as well as the towns of Fontainebleau and Brioude. I have attached in appendices a full list of the waters sold in these bureaus, broken down in *denier* per pint (*denier* abbreviated to ‘d’) when that calculation was possible, so as to facilitate comparisons by using a unified unit.<sup>261</sup> These tables reveal much of the state of the market in the 1770s, a time during which institutional control just started to take a firmer hold on the market.<sup>262</sup>

It is clear, first, that prices varied considerably, from 72d to 1,920d per pint. The cheapest waters were those of Passy in Paris, as well as the waters of Chantejals, Vic-le-Comte and Bar in Brioude. In each of these cases, the low price, at 72d a pint, can be explained by geographic proximity. The most expensive water of all was that of Châteldon, which sold in Paris at 192d a pint

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<sup>260</sup> Minutes of the *Commission* on the waters of Merlange, 29e assemblée, (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM. “Comme les eaux de Merlange sont de peu de conséquence nous estimons qu'on peut les transporter à l'ordinaire dans des bouteilles de gros”.

<sup>261</sup> See Appendices n°[5], n°[6] and n°[7] on the prices of mineral waters in the bureaus.

<sup>262</sup> In the period at hand, the currency system used is almost solely the *Livre* system. 1 livre = 20 *sous* or *sols* = 240 *deniers*. Because the conversation is not particularly easy, or in base 10, I elected to reduce everything to *deniers* values, so that they can be easily compared. Normally, these prices would all be given in the form 2<sup>l</sup> 7<sup>s</sup> 1d for example, meaning 2 *livres* 7 *sols* 1 *denier*.

(or 8<sup>th</sup>). As such it was an outlier, since other upscale waters hovered around 700d or 800d per pint.

The average price per pint among all waters was 369d (1<sup>st</sup> 6<sup>th</sup> 9d). To put a number like this into context, based on Jean Sgard's study of the income scale, in the eighteenth century, the lowest paid workers could expect to make between 100 and 300<sup>l</sup> in the year, or 10<sup>s</sup> a day.<sup>263</sup> For individuals in this income bracket, mineral waters were forbiddingly expensive, as the price of a single bottle would correspond to some three days of work, and typically a single pint was not enough to be cured. They could perhaps afford the cheapest waters available, if they saved, but even those, at 6<sup>s</sup> a pint, were priced at around half a day's worth of work.

The next income bracket, including professions such as teachers, wood workers, or newspaper editors, made between 300<sup>l</sup> and 1,000<sup>l</sup> a year. At such incomes, paying for the five or six bottles needed to fend off an illness would be more conceivable, albeit still expensive. All income brackets above this one, from the bourgeois to the high nobility (those earning from 1,000<sup>l</sup> to 400,000<sup>l</sup> a year), would have little trouble in affording the occasional bottle, and could even consider getting the more expensive ones. This suggests that mineral waters, while not available to all, were affordable to a large portion of the salaried population. In so far as the poor were often given waters for free (provided they could present the required evidence certifying the validity of their poverty), there was in fact a significant percentage of the eighteenth-century population that may have had some degree of access to mineral waters.<sup>264</sup> Waters were not by any means cheap, but they were also not a commodity that needed to be purchased on the daily.

Another important piece of context would be to see how mineral waters compared to other kinds of remedies. The *Dictionnaire Portatif de Santé*, published in 1759, gave indications in that regard. Like other publications of the same genre, it listed a large number of remedies, making it difficult to calculate average prices. But comparisons with other liquid remedies are still possible. A pint of orange flower water was, for example, priced at 3<sup>l</sup>, while a pint of water infused with Ribwort plantain, a more common plant, cost 1<sup>l</sup>.<sup>265</sup>

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<sup>263</sup> Jean Sgard, "L'échelle des revenus," *Dix-huitième Siècle* 14 (1982).

<sup>264</sup> The fact that mineral waters were handed out for free to the poor also makes the finding of an absolute price scale difficult. It does however vouch for their perceived value. If the waters were worth giving out as charity, this meant they held a form of spiritual value, making them intrinsically more valuable to those who could afford to pay for them. Two important references regarding the concept of value in economics: Maurice Godelier, *Rationalité et irrationalité en économie* (Paris: Maspéro, 1966).; Edward Palmer Thompson, "The Moral Economy of the English Crowd in the Eighteenth Century," *Past & Present* 50 (1971). On the links between poverty and thermalism specifically, see: Olivier Faure, "Aux marges de la médecine. Santé et souci de soi. France XIXe siècle," *Revue d'histoire du XIXe siècle* 52, no. 1 (2016).

<sup>265</sup> Charles Augustin Vandermonde, "Dictionnaire Portatif de Santé, Dans Lequel Tout Le Monde Peut Prendre Une Connoissance Suffisante de Toutes Les Maladies, Des Différents Signes Qui Les Caractérisent Chacune En Particulier," (A Paris, chez Vincent, Imprimeur Libraire de Mgt le Duc de Bourgogne, rue S. Severin, 1759), xv.

This would place mineral waters in the average regarding the price of liquid remedies, or at least in the not-unheard-of category. Plenty of home remedies were obviously a lot cheaper than those available at an apothecary. But since mineral waters were often sold by apothecaries too, it is notable that the price per pint was close to other items in their stock. This reinforces the idea that mineral waters had become common enough to be on par with other types of remedies.

The survival of price lists for various cities allows for a differentiation between the prices of waters in Paris and other cities. The distinction is essential, as Parisian prices, which tend to be the best studied in the period, were not generally representative of the rest of the country. In this case, it appears that Parisian prices were comparable to those in Fontainebleau, with the average price in Paris at 526d a pint, while it was 566d a pint in Fontainebleau. Paris and Fontainebleau are, however, not far from each other, and were likely to have used similar transports. In Marseille, and Lyon, the average prices were much lower, at 150d and 391d per pint respectively.<sup>266</sup>

Only two waters were sold in all five towns: those of Vals, and Barèges. Both were well established spa towns, Vals being located in the southern Massif Central, and Barèges in the Pyrenees. The prices were listed as follows:

Price in deniers per pint in →	Fontainebleau (1773)	Lyon (ca. 1773)	Marseille (1773)	Brioude (1773)	Paris (1772)	Paris (1783)
Barèges	720	600	480	1,044 per bottle	720	576
Vals	576	240	150	864 per bottle	720	540

Figure 2.6 Price of the waters of Barèges and Vals in different bureaux.

This table mostly shows variety. The price of the waters of Vals especially, differed widely according to where they were sold. In 1760, they increased in price in Paris, from 432d a pint to 480d per pint.<sup>267</sup> Another decade later, it could be bought in Marseille at only 150d per pint, roughly four times cheaper than in Paris, where it rose yet again to 720d. In this case, distance played a large role. Vals was a town nestled in a mountainous region, which was not easy to access by carriage. It was however quite close to Lyon, thus explaining the price difference with Paris. But since it was about halfway between Lyon and Marseille, as the crow flies, it is more surprising to see how much better

<sup>266</sup> In Brioude, I was not able to calculate an average price per volume, since the majority of the waters were sold in a “bouteille” (bottle) of unknown volume. If that bottle contained a pint of liquid, this would bring the average to 567d a pint, which would make it comparable to the Parisian prices. This is, however, not a verified result.

<sup>267</sup> Correspondence from Nègre to Sénac, SRM 90B, dossier 25, pièce 8, ASRM.

the deal was in Lyon compared to Marseille. Transportation was likely not the reason, as the river Rhône made for an obvious route between Vals and Marseille. With that being said, a document also from 1773 in Marseille suggests that the prices of the Vals waters were in fact 552d per pint, thus putting it in a similar range to the other towns.<sup>268</sup> For the waters of Barèges, the prices seem more stable.<sup>269</sup>

This kind of change in price was also found in other waters. The waters of Spa were imported by the bureaus of Paris, Lyon and Marseille. But whereas the price in Paris was 480d per pint, in Lyon it was much higher at 600d, all while Marseille bureau was selling it for only 240d a pint.

It is also important to note that these prices per pint are to a certain extent fictitious. While some of the waters were sold by the pint, some were only available in bigger or smaller bottles. Since the bottle itself factored in the price, these calculations are by necessity not fully accurate. This is not just a theoretical consideration. In Paris for example, in 1783, the waters of Cransac, Balaruc, La Mothe and Vals were all offered in two different kinds of containers, either by the pint, or in bigger bottles of four pints. The waters of La Mothe cost 8<sup>n</sup> for the four pints bottle, or 2<sup>n</sup> 3<sup>l</sup> for the one-pint bottle, making it slightly advantageous to buy it in the larger quantity, rather than paying for four one-pint bottles.<sup>270</sup> This meant that technically, in the Paris bureau, the Châteldon water was not the most expensive item available. Those bigger bottles costing 9<sup>n</sup> were in fact the priciest item one could purchase at the bureau. The Châteldon water simply represented the lowest amount of water for the price. To further complicate things, the Vichy waters were also available in different quantities, but the price was in this case proportional. This suggests that in some cases, the sellers priced their waters according to the price of the bottle (and a bigger bottle therefore meant that a small reduction was possible), and some priced it to the value of the water itself, and therefore making no difference according to what kind of container was used.

There is some evidence that the prices varied from year to year. Regrettably, I do not have year by year price lists for many towns, but the Paris bureau had a list both for 1773 and 1783, which does allow for some comparative work.

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<sup>268</sup> “Privilege exclusif pour la vente des eaux minérales, à Marseille, en faveur du Sr. Laville Duvernet”, 22e assemblée, (15<sup>th</sup> April 1773), SRM 111A, dossier 18, ASRM. “Eaux de Balaruc dont la bouteille contient environ quatre pintes mesure de Paris, 42 sols la bouteille ; Eaux de Vals & d’Hieuset, même mesure, 3 liv. 6 sols la bouteille non compris les bouteilles, nous réservant de fixer le prix des autres Eaux Minérales en tems & lieu”.

<sup>269</sup> This was perhaps due to the spring’s location in the Pyrenees, which meant that there was a fixed cost of leaving the south-west region, which meant that despite differences in distances, all bureaus had to pay for the most expensive part of the route which was at the start of the journey.

<sup>270</sup> For the one pint bottles, the price comes to 516d per pint, which is more expensive than when compared to the bigger bottles, in which case the price is 480d per pint.

<b>Waters sold in Paris</b>	<b>Price in livres and sols (tt, j), 1772</b>	<b>Conversion to deniers per pint</b>	<b>Price in livres (tt), 1783</b>	<b>Conversion to deniers per pint</b>
<b>Forges</b>	15j for 1 pint	180	15j for 1 pint	180
<b>Sainte Reine</b>	15j (idem)	180	15j for 1 pint	180
<b>Merlange</b>	1 <sup>n</sup>	240	3 <sup>n</sup> for 4 pints	180
<b>Vichy</b>	1 <sup>n</sup> 10j	360	4 <sup>n</sup> for 4 pints or 1 <sup>n</sup> for 1 pint	240
<b>Bourbonne</b>	2 <sup>n</sup>	480	1 <sup>n</sup> 10j for 1 pint	360
<b>Spa</b>	2 <sup>n</sup>	480	2 <sup>n</sup> for 1 pint	480
<b>Sedlitz</b>	2 <sup>n</sup>	480	5 <sup>n</sup> 5j for 3 half pints	840
<b>Bussang</b>	2 <sup>n</sup>	480	1 <sup>n</sup> 10j for 1 pint	360
<b>Seydschutz</b>	2 <sup>n</sup>	480	5 <sup>n</sup> 10j for 3 half pints	880
<b>Plombières</b>	2 <sup>n</sup> 10j	600	2 <sup>n</sup> for 1 pint	480
<b>Selz</b>	2 <sup>n</sup> 10j	600	2 <sup>n</sup> for 1 pint	480
<b>La Mothe</b>	2 <sup>n</sup> 10j	600	8 <sup>n</sup> for 4 pints or 2 <sup>n</sup> 3j for 1 pint	480
<b>Vals</b>	3 <sup>n</sup>	720	9 <sup>n</sup> for 4 pints or 2 <sup>n</sup> 8j for 1 pint	540
<b>Balaruc</b>	3 <sup>n</sup>	720	9 <sup>n</sup> for 4 pints or 2 <sup>n</sup> 8j for 1 pint	540
<b>Cransac</b>	3 <sup>n</sup>	720	9 <sup>n</sup> for 4 pints or 2 <sup>n</sup> 8j for 1 pint	540
<b>Cauterets</b>	3 <sup>n</sup>	720	2 <sup>n</sup> 8j for 1 pint	576
<b>Bonnes</b>	3 <sup>n</sup>	720	2 <sup>n</sup> 8j for 1 pint	576
<b>Barèges</b>	3 <sup>n</sup>	720	2 <sup>n</sup> 8j for 1 pint	576

Figure 2.7 Price evolution in the sale of mineral waters in Paris. The colour represents the evolution of the price. When the cell is green it indicates a lower price than the other date.

Figure 2.7 shows the changes in price between the 1773 and 1783 lists. In 1783, a few more waters had also been added to the stock, but they are not included here. One thing is abundantly clear, the prices for that decade tended to diminish. The only two waters of which the price increased significantly were imported from abroad. All French waters either lowered in price or

remained the same.<sup>271</sup> The fact that the price of the waters of Merlange dropped significantly, and that they were available in bottles of four pints only suggests that the regulatory institutions decided to be lenient and authorised their sales not in glass bottles, but in the sandstone bottles, prioritising the lowering of the price. This conclusion can be tentatively expanded to the other price reductions. They were, at least in large part, the effect of regulation. This would also explain why the only waters that were untouched by price diminutions were the already cheapest ones that could suffer no further price cuts, and the foreign waters of Spa, Sedlitz and Seydschutz, that were not subjected to French rule.

The overall price reductions indicates that although margins were tight, a large part of the price of waters was decided not just by circumstances, but also by laws and regulations. In the less regulated market that existed before 1772, prices were in fact higher than in 1783, after a decade of state-enforced regulation. This was also true in other cities than Paris. In La Rochelle for example, a disgruntled prospective bureau tenants complained that in this city of merchants, everyone “speculated for their own interests”, leading to outlandish prices, like the Vichy waters costing 40<sup>l</sup> a bottle (i.e.: 480d a pint), which was indeed much more expensive than in Paris, or those of Availles which were only “25 miles from la rochelle” and cost 20<sup>l</sup> a pint.<sup>272</sup> This highlights the other very important factor which was geography. Transport was an essential part of the cost.

#### *Distance, the primary factor in price determination*

The cities which offered the greatest diversity of waters were Paris and Lyon. While Fontainebleau, Brioude and even Marseille all offered between five and ten different types of waters, the Lyon bureau had twenty-three different sources in stock, while the Paris bureau, as of 1783, offered twenty-six. This diversity did not just correlate with the size of the town. Brioude had a much smaller population than Marseille, but still had double the diversity of waters on offer, likely because it was situated in a region abundant in mineral springs. Still Marseille, which sat on the Rhône river and was in a good position to

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<sup>271</sup> The waters of Passy, although they were not sold at the bureau in 1772, were up for sale in a separate distribution point, for 15<sup>l</sup> a bottle. When they started being sold at the bureau in 1783, the price was also diminished to 6<sup>l</sup> a pint. Gabriel François Venel and Pierre Bayen, “Analyses chimiques des nouvelles eaux minérales, vitrioliques, ferrugineuses, decouvertes a Passy dans la maison de madame de Calsabigi. Avec les propriétés medicinales de ces mêmes eaux, fondées sur les observations des médecins & chirurgiens des plus célèbres, dont on rapporte les certificats authentiques,” (1757), 19.

<sup>272</sup> Correspondence to the *Commission*, 22e assemblée, (15<sup>th</sup> April 1773), SRM 111A, dossier 18, ASRM. “je n'avois pas perdu de vüe l'establissement d'un Bureau d'Eaux minerales a la rochelle ; depuis 25 ans j'y ay trouvé des obstacles difficiles a surmonter. dans une ville de comerce chacun spéculé pour ses interests ; plusieurs chirurgiens en ont debitté et debitent encore ades prix enormes. particulierement de celles de vichy a 40<sup>l</sup> la bouteille de pinte. celle d'availles distantes de 25 lieues de la rochelle a 20<sup>l</sup> , celles de Cransac a 30<sup>l</sup> : ils ont été plusieurs en concurrence.”

strike deals with transporters, apparently decided not to expand the stock beyond five waters. In this case as in others, it may have been a lack of demand, rather a lack of supply, that regulated how many waters were on offer.

Because the kinds of waters that were on offer depended largely on the bureau tenants and their arrangements with transporters, there was no standard list of which waters had to be present in the bureaux. Demand was created by the buyers, and especially by the physicians who prescribed the waters to their patients, but ultimately, if the tenant could not secure a deal with a transporter, some waters were simply not available. On the other hand, even lesser-known waters could be sold at the bureau, when a spa town used the bureau as a place of promotion. This meant that although some waters were stocked in bureaux around the country – notably the waters of Vichy, Bagnères-de-Luchon, Balaruc, Vals, Bonnes – other waters could only be found at their local bureaux. The ‘inconsequent’ waters of Merlange were only sold in Paris, because the proximity catered for low transport costs, which made the import worthwhile in spite of the lack of fame.

It is worth seeing these different springs on a map in order to better understand the importance of distance. Generally, each bureau had in stock a selection of the more famous names. This was very much the case for the bureaux of Marseille and Fontainebleau (Figure 2.8), both of which had a small selection of well-known springs.

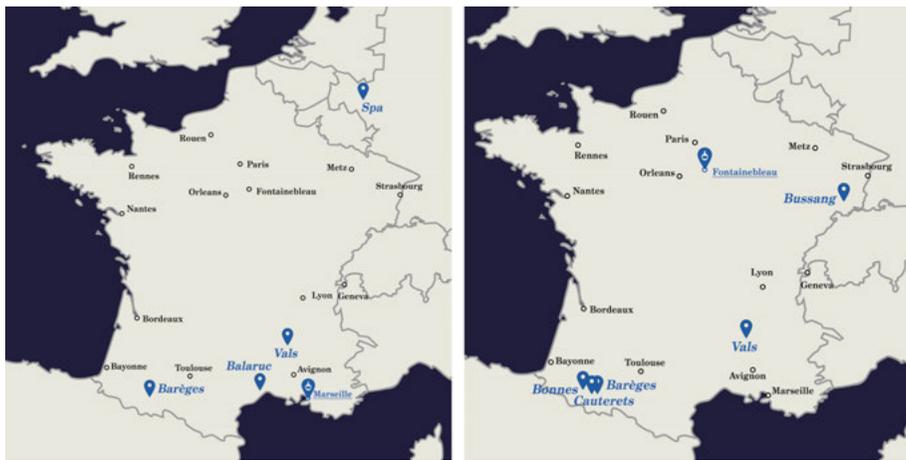


Figure 2.8 Origin of the waters sold in the bureaux of Marseille (left) and Fontainebleau (right) (1773). Maps by author.

The bureau of Brioude, on the other hand, operated a different business model, by stocking both famous waters, such as those of Bonnes and of Barèges, and local and rarer springs, like the waters of Saint Nectaire (Figure 2.9).



Figure 2.9 Origin of the waters sold in Brioude (1773). Map by author.

The map makes it very clear that a lot of the waters sold in small towns originated in neighbouring regions. A small bureau like Brioude was not in a position to negotiate a good deal with Sedlitz or Spa, but its tenant was more likely to keep personal ties with the staff at the source of nearby Vic-le-Comte, Chantejals, and Vichy. The bureaus of Lyon and Paris combined, for their part, a large supply of the more famous names, with a sprinkling of local sources (Figures 2.10 and 2.11).



Figure 2.10 Origin of the waters sold in Lyon (ca. 1773). Map by author.



Figure 2.11 Origin of the waters sold in Paris (1783). Map by author.

The two maps show a lot of overlap. Both Lyon and Paris supplied their buyers with waters from the Pyrenees, and stocked a selection of German waters, including those of Sedlitz. They also both stocked the famous Spa water, and those of the springs of Vals, Vichy, Cauterets, and Balaruc. Some distinct choices can however be discerned. It is apparent that the Paris bureau had a privileged access to the local waters of Passy and Merlange, as well as a large selection from the Lorraine, which was easily reached by carriage from Paris, as testified by the sale of waters from Alise and Contrexéville. The Lyon bureau, on the other hand, was surrounded by its own cluster of local springs, with the presence of the waters of La Mothe, the Mont d'Or, Saint Alban and Vic-le-Comte.

Essentially, this proves that the offer of mineral waters in the springs did not depend on a single factor, such as distance, reputation, local arrangements, medical interest, regulation, or reach of the advertisement. But rather, it shows a blend of all of these factors. Some waters were available for the convenience of being close, and therefore cheap. In that case, good interpersonal relationships between the bureau tenant and the staff at the spring were likely very important. But fame and reputation also had an important role to play. This is well-evidenced by the presence of the waters of Spa in so many different bureaux. Because these famous places had their own networks of distributors, it was not as difficult for bureau tenants to simply tap into this existing network and be added to the list of regular deliveries.

One notable absent factor in the price was the kind of diseases that the waters were said to be able to cure. Though one could expect that the more versatile waters would cost more, in reality, this was a very rarely mentioned argument. At times, some analysts might have boasted the high concentration in minerals of a particular water as a selling point, but these arguments were not found in the world of sellers and bureau tenants. This also had to do with the fact that most physicians tended to associate each spring with dozens if not more ailments, which made it a bad price indicator, as it was too easy to exploit.

## Conclusion

This sketch of the market of eighteenth-century mineral waters presents a number of compelling conclusions. Though necessarily incomplete, because of a lack of surviving archives and prior research on the subject, much can be learned about the pressures that were put on physicians and regulators as they attempted to control the public use of mineral waters.

The case study of Vichy portrays the typical operation of French spa towns in the period. It demonstrates that the mineral water market, despite growing significantly during the eighteenth century, was largely organised – and more or less manageable – by way of interpersonal relations. Spa towns had to rely on every possible advantage in order to keep attracting patients. In the case of

Vichy, this is visible not least in the city's close relationship to Paris, as cultivated by the intendants. Safeguarding the reputation of the waters was an important task, but the intendants also had to ensure steady funding, and resolve day-to-day conflicts. Running a spa town was a complex operation, and the intendants were only one category of spring workers. There were many others who contributed to the operation, notably the bathers and the hospital staff.

An important finding to highlight is the limited profitability of selling mineral waters, and what this reveals about demand. Few bureau tenants earned more than the equivalent of a low-skilled worker's salary in annual profits. Because bureau tenants had to pay for the upkeep of their shops, water-selling must have been untenable as a sole source of income – which suggests that many bureaux sold mineral waters as a complement to other revenues. The fact that many apothecaries were willing to go through the trouble of adding a new facet to their regular business for low rewards, testifies to a widespread demand for mineral waters. The increase in the number of bureaux towards the end of the century would confirm this hypothesis.

Studying the market of mineral waters clearly presents a rewarding approach to the study of the mineral waters themselves. Spa physicians could be overly enthusiastic in the claims they made regarding the celebrity of their own springs, making it difficult to get reliable data on which mineral waters actually circulated. The general prevalence of the waters of Vals is for example an unexpected find, one that points to further research that could be conducted on this particular spa. It appears, overall, as though the availability and popularity of some waters depended on the location of the bureau. Those in the northeast clearly favoured the waters of Spa, while the southern bureaux more often tended to stock waters from the Pyrenees and Auvergne.

Against what could be assumed, eighteenth-century mineral waters were relatively inexpensive, or at the very least accessible to a large portion of the urban population.<sup>273</sup> The waters were not treated solely as luxurious cures of the elite. They were general commodities, which came on and off the market according to the ebbs and flows of demand, while also dependent on supply, and the complexities of transport. This fluidity in the market can easily be confirmed by comparing the waters which were popular in the eighteenth century to those of the seventeenth and nineteenth centuries. Although a few names remained constant throughout all three centuries, other waters were discovered and subsequently forgotten within just a few decades.

Given the difficulties in staying in this fluid market, the work of medical professionals had significant implications. The example of Vichy shows how important the reputation of the waters could be, even for well-established

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<sup>273</sup> The rural population only had access to mineral springs if they were nearby, as there were no rural bureaux of distribution. That being said, the mineral springs themselves were often in the countryside, and thus easily accessible to the locals. As more mineral springs were discovered with each passing decade, in practice, a large portion of the French kingdom was within reasonable distance of a spring. See map in Chapter 1 (Figure 1.1).

springs. For a lesser-known water, a poor analytical report was potentially catastrophic, especially if the spring's intendant did not have the lobbying power and connections of the Vichy intendants. The scientific work on mineral waters was never constrained to learned circles, and could influence the market.

Finally, the drop in prices in the 1770s shows that regulation did have a notable effect on the market. Much like the actions and opinions of physicians, legislation was not trivial, and could have intense repercussions on those who earned a livelihood through the mineral water market. Regulatory agencies had to manage these high stakes with their ambition of control. This regulatory work was largely conducted by the Société de Médecine, an institution which I will turn to in the following chapter.

## Chapter 3. The Société Royale de Médecine, an attempt at centralised control

The Société Royale de Médecine (or *Société*, 1778–1793) was a government-appointed institution, charged with centralising the administration of waters and remedies in the hands of a small community of physicians. It enforced, or at least attempted to enforce, a set of regulations and standards onto the trade of mineral waters, with long-lasting consequences. But despite being a fertile field for the collaborations between chemistry and medicine in the eighteenth century, it has almost never been studied as such. This chapter therefore has two aims. The first is to recount an updated history of the *Société*, its predecessors, foundation and activity. The second will be to examine the role of this institution and some of its predecessors in regulating mineral waters. Regulation, even when it is ineffective, shapes the market, particularly in the medical field. I will therefore study the set of legislative measures that were put in place by the *Société* and what they reveal of the kinds of standards that it tried to impose onto the market.

These two aims are complementary, since the standards championed by the *Société* found their roots in its history. This institution came to life from a patchwork of previous governing bodies and a complex and layered system of law. Its ambitious foundational principles encountered much resistance along the way. These hurdles shaped the actions of the *Société* and altered its perception of the necessity of regulation. This eclectic nature also characterised its members, which came from a few different disciplinary traditions, as well as a variety of social backgrounds. The institution was wide-reaching, thanks to its large network of correspondents who gathered data from their respective regions, providing an invaluable insight into the activity of physicians and chemists on all questions related to remedies.

Officially, the *Société* received its Letters patent from the king on August 29<sup>th</sup> of 1778. The *Société* then established its ambitious legislation, before settling into a rhythm of activity for the next two decades, which was suddenly interrupted by the French revolution. It was then destitute in 1793, alongside all other academies. This short life could have made it of relative trivial importance in the long list of eighteenth-century scientific institutions, if it were not for its incessant activity during this time, as well as the activity of its predecessors, the First physician and the *Commissions*, which lengthened the time of influence of a *Société*-like institute. I will base this account of institutional history on some prior research, but given the difficulty in obtaining a

consistent narrative of the events from secondary literature alone, I have elected to reconstruct as much of it as possible from the archives and records of the *Société* itself.<sup>274</sup>

I will begin this chapter by detailing the basic legal construction on which all subsequent regulation of mineral waters were based: the law of the superintendency. I will then recount the different attempts at bringing institutional control over remedies, by exploring the prerogatives of the First physician throughout the eighteenth century, and the creation of two *Commissions*. These two institutions were later merged into the *Société*, but its activities could not begin right away. Its early days were consumed by a controversy with the Faculty of Medicine of Paris, which will be examined in detail. With this institutional background established, I will then move on to the topic of legislation, and study the attempts at internal regulation of the different institutions, as well as the kind of power that they tried to exert over the market of mineral waters.

## The superintendency: laying the groundwork of regulation

The growing reach of the mineral water market prompted several government figures to draw plans that would allow for closer regulation. While spa towns were important places which turned revenues from visiting patients, it was

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<sup>274</sup> Some accounts have been written of the institutional history of the *Société de Médecine*, but three reasons have led me to attempt to write my own here. First, these accounts although numerous, are constantly contradicting. Many inconsistencies can be found from changing dates, to varying reasons stated for the creation of the institution. The fact that the *Commission* and the *Société* were two different institutions is at times entirely overlooked. Some secondary literature regarding the *Société de Médecine* makes no mention of the *Commission*, or sometimes wrongfully assumes that 1772 was the date of creation of the *Société*. Admittedly, this mistake is easy to make, as the institutional map of the 1770s is rather complex. Nevertheless, the *Commission* and the *Société* were distinct, with separate structures, members and vastly different sizes. The second reason is that much of this literature only exists in French, with a few exceptions. I therefore aim to bring this institutional history to the anglophone world. The third and final reason is that all of these accounts tend to side-line the importance of mineral waters and often overlook the presence of chemistry as one of the driving forces of the *Société*. For that reason, I believe that the *Société* has been undeservedly left out of the history of chemistry. The existing accounts of the history of the *Société de Médecine* are the following: Julien Rondard, “La société royale de médecine et la question des remèdes secrets (1778–1793), de l’empirisme vertueux au charlatanisme effronté, tentatives de régulation d’un marché” (Mémoire de master Paris 1 Panthéon-Sorbonne, 2010–2011); Philippe Borel, “Comprendre l’enquête de la Société royale de Médecine (1774–1793) Source, problème et méthodologie,” *Histoire des Sciences Médicales* XXXIX, no. 1 (2005); Jarrassé, *Deux mille ans de thermalisme : économie, patrimoine, rites et pratiques.*; Marie Laure épouse Barrault Simonetta, “La Société Royale de Médecine 1776–1793” (Mémoire de Maîtrise 1992); Hannaway, “Medicine, Public Welfare and the State in Eighteenth Century France: The Société Royale de Médecine of Paris (1776–1793).”

mostly the beginning of the export of waters which caught the attention of regulators. The argument for legislation almost always rested on complaints of fraudulent activity, which was said to endanger the public. In an attempt to curb the purported fraud, a number of Letters patent were written between the late seventeenth century and eighteenth century, in order to grant a few select individuals the rights to distribute waters. These letters were however only one small part of the regulatory apparatus which was to be deployed over the market of waters.

By the 1770s, the market of mineral waters had become international, and rather extensive. This meant that any attempt at regulation had to either match its size, or be fluid enough to allow for a lot of self-determination at each spa town. The wish for closer regulation did not come solely from ministers. Some pressure came from the local level, with intendants, or town physicians arguing for stricter legislation.<sup>275</sup> Often, the different entities involved with waters, regulators, spa town municipalities, transporters, blamed the other members of the network for the rampant fraud, which encouraged regulators to constantly tighten the rules. This process, however, took place over many decades, and the first central institution dedicated to the administration of mineral waters would not see the light of day before 1772. Before this date, the authority over mineral waters was the responsibility of a powerful court member.

#### *The role of the First physician*

The first regulations concerning remedies were instated by Henri III (r. 1574–1589) with the formalisation of the position of First physician. This decision led to the creation of a new position at court for a highly qualified medical doctor. The holder of this new office was encumbered with two important missions. The first was to be the appointed physician of the king. The First Physician had to be present at the king's first awaking every morning, and had to tend to the daily and exceptional medical needs of the monarch. It was a very time-consuming occupation that required the most complete trust from the sovereign. The second, equally important task of the First physician was to be the head of the medical house of the king, and by extension, the head of medical practitioners in the kingdom.<sup>276</sup> At court, the First physician oversaw the rest of the court doctors, and from the reign of Henri IV (r. 1589–1610) onwards, he was assisted in this task by the Ordinary physician, or physician of the queen, who acted as substitute when the First physician was unavailable. These tasks were compensated by salary of 3,000<sup>l</sup> per quarter, in addition to a hereditary title of nobility.<sup>277</sup>

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<sup>275</sup> See for example the mention by Esquirou in 1718: Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. "leurs caprices".

<sup>276</sup> Guy Chaussinand-Nogaret, "Nobles médecins et médecins de cour au XVIIIe siècle," *Annales. Economies, sociétés, civilisations* 32, no. 5 (1977).

<sup>277</sup> George Robert, "Le premier médecin du Roi," *Histoire des sciences médicales* XXXII, no. 4 (1998), 375.

Buried in this long list of obligations, the First physician was given intendency over the administration of remedies, as part of his overseeing of the medical practice in the kingdom. Mineral waters, due to their status as remedies, were therefore his responsibility. This meant that as early as 1605, there was an official position for a *Surintendant des Eaux*, or Superintendent of the Waters, in the person of the First physician. His role from the start and for the remainder of the seventeenth century was to circumvent the illegal transportation of mineral waters. As the position changed hands, new Letters patent were written to reinstate this authority.<sup>278</sup>

The First physician did deliver permits to trusted carriers, but he could not thwart the growing numbers of unaccredited transporters who were meeting the demand faster than he could write permits. This would not necessarily be of high concern for the state if it were not for the difficulty of identifying and reliably check the nature and quality of mineral waters. They were easy products to fake, which made the task of overseeing their transportation difficult. Many documents showed this concern. A manuscript from 1661 discussed the issues that came with transporting the waters of Cransac. It mentioned the number of risks that arose when this “mineral Fountain which is salutary to the human body” was mishandled and thus made unsafe for consumption.<sup>279</sup> Another document mentioned the name of the surgeon Filasac, who was one of the authorised sellers of mineral waters in Paris, who had been accused of “distributing false mineral waters”, as of 1686.<sup>280</sup> In 1697, the physician Linand gave his readers indications on how to avoid low quality waters.

One feels obliged to caution here those who could only take these Waters in Paris, to be well ensured of the fidelity of the people who bring them there, & to know if some Fresh [waters] arrive to them every 2 or 3 days.<sup>281</sup>

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<sup>278</sup> See for example the 1672 Letters patent given to d’Aquin: *Copies d’actes émanés des rois Henri IV, Louis XIII et Louis XIV, recueillis pour servir de modèles (1610–1669)*. Aquin, (Antoine d’), - premier médecin, surintendant des Bains et Eaux minérales (1672), Le xx juillet 1672 a expédié des lettres patente y portant concession a M d’Acquin premier medecine de la surintendance des bains et eaux minerales du Royaume, (20<sup>th</sup> July 1672), O/1/16, fol. 141 v°, AN.

<sup>279</sup> Cransac en Rouerque (Aveyron) source d’eau minérale, bon de fontaine d’eau minerale, (1661), O/1/11, fol. 288, AN. “Fontaine minerale qui est salutare au corps humain”.

<sup>280</sup> This document is missing from the National Archives, but its title briefly summarises its content. *Maison du roi. Filasac (sr), accusé de distribuer de fausses eaux minérales / Manquant*, (1686), O/1/30, fol. 254 v°, AN. There is also a reference to this surgeon in: Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.”, 24.

<sup>281</sup> Barthélémy Linand, “Lettre de Me. Barthelemy Linand docteur en medecine écrite a M le 15. octobre 1696 où il répond a quelques objections qu’on a faites contre son livre des eaux minérales de Forges,” (A Paris, Chez la veuve de Charles Coignard, 1696), 21. “On se croit obligé d’avertir ici ceux qui ne sçauroient prendre de ces Eaux qu’à Paris, de se bien assurer de la fidelite des personnes qui les y font venir, & de savoir s’il leur en arrive de Fraiches tous les 2. ou 3. jours.”

He completed this note of caution by a recommendation, indicating that the widow Duhamel in Paris was a trustworthy seller and she received legitimate waters several times a week.<sup>282</sup> This kind of note was one of the only ways, for the average drinker, to make sure that they were not being defrauded. Short of a personal recommendation or a good relationship with a transporter, it was easy for a buyer to inadvertently purchase what could be just overpriced rain-water.

But despite these risks of fraud, the public still wanted to purchase mineral waters, and the spa towns were still keen to make a profit from the export. So the First physician kept using his authority to grant a number of permits and positions to select individuals, who would in turn make sure the waters were handled properly. In 1666, he gave the right to two Parisian surgeons to sell the waters of Sainte Reine, Spa, Saint Myon and Forges, for a fee of 100<sup>l</sup>.<sup>283</sup> In 1709, the distributor of waters in Paris wavered his own privilege to give it to his son, who would take on the task of selling the waters of Sainte Reine, Vichy, Bourbon and a few other remedies.<sup>284</sup>

The First physician also named a number of intendants, who filled similar roles to those of Vichy.<sup>285</sup> When writing their official authorisations, he always included flattering comments describing why they were suited for the job. In 1719, the intendant of Segray was nominated, arguing that he deserved the position for all the charity work he had done in the region.<sup>286</sup> His successor

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<sup>282</sup> Ibid, 22.

<sup>283</sup> Pascal Chambriard, “L’embouteillage des eaux minérales : quatre siècles d’histoire,” *Annales Des Mines* (1998), 21–22. By a treaty established on December 7<sup>th</sup> 1666, Louis Barail and Arthur Filensac were granted the right to sell the waters of Sainte-Reine, Spa, Saint-Myon and Forges in Paris, for 100<sup>l</sup> per year. See: Antonin Mallat, “Histoire des eaux minérales de Vichy,” (Paris: Masson et Cie, 1906–1922), 20.

<sup>284</sup> The privilege at this time extended also to Versailles, Saint Germain, and the quite distant town of Fontainebleau. Minutes et répertoires du notaire Claude I Royer, janvier 1675–23 avril 1709 (étude I), (5<sup>th</sup> October 1707), MC/ET/I/233, AN. “surintendant des eaux Bains et fontaines Mineralles et Medicinalles de France, a volontairement par ces presentes cédé quitté abandonné et delassé au Sr Jean Baptiste Jacques Daumons son fils aussy bourgeois de Paris [...] a ce present et acceptant pour Luy le Drois Privilege et Permission a luy accordée par Mond sieur fagon de Debiter, Vendre Es Distribuer En la ville de Paris, Versailles, St Germin, fontainebleau et suite de la cour des Eaües de forge de Ste Reyne de Vichy de Bourbon, eaües de la Reyne d’hongrie, sirops de cappillaires et autres mentionnées en Ladte Permission et Privilege en datte du Trois Janvier Mil Six cents quatre vingts quatorze pour en jouir par ledts Sieur Daumont Pere lequel luy a pour ces effets presentement delivré Ledt Privilege avec les sentence, arrests et Autres pieces servantes a la validité d’Iceleux”.

<sup>285</sup> See the above section on Vichy. Its intendants were given their various rights through the authority of the First physician. See for example the authorisation granted to Tardy to sell the waters of Vichy, in: Tardy (sr) lettres patentes sur arrêt qui permet au sr de vendre et débiter les eaux minérales de Vichy, (13<sup>th</sup> July 1771), O/1/117, fol. 793, AN. “Lettres Patentes sur arret qui permettent au S. Tardy de vendre et debiter les Eaux minerales de Vichy./.”

<sup>286</sup> Bourdin (Laurent) provisions d’intendant des eaux minérales et médicinales, (17<sup>th</sup> August 1719), O/1/63, fol. 214 v°, AN. “Provisions d’Intendant des Eaux minerales et medicinales de Segray par Pinier pour le Sr Laurent Bourdain”.

who was said to be equally deserving received his “provisions” in 1737.<sup>287</sup> In 1724, an intendant was named in Bourbon-Larchambault, who had proven his good religion and was described as deserving of all trust.<sup>288</sup> In 1743, an intendant was given authority over the waters of Saint Santin and Segray, as their “usage should be conducted by a trustworthy person who has a perfect knowledge of them”.<sup>289</sup>

In 1709, the charges of superintendency over mineral waters and First physician, although they were already adjacent and held by the same person, were formally merged via Letters patent.<sup>290</sup> This was repeated twice, in 1715 and 1718.<sup>291</sup> This done in a bid to combat the growing illegal trade and re-establish the authority of the First physician. The letters themselves made this explicit:

The usefulness that our Subjects retrieve from Mineral & Medicinal Waters which are in great number in our Kingdom, is so considerable, that the Kings our Predecessors have strived to divulge those of different natures [...]

We have learned that fake ones are often being sold, or genuine ones are being transported in too high quantity<sup>292</sup>

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<sup>287</sup> Milliere (Jean-Baptiste) docteur en médecine de la Faculté de Reims : provisions d'intendant maître des eaux minérales et médicinales de Segray près Pithiviers-en-Gâtinais, (16<sup>th</sup> August 1737), O/1/81, fol. 303–304, AN.

<sup>288</sup> Preverand (Pierre) docteur en médecine de la Faculté de Montpellier : provisions de la charge d'intendant et maître des eaux minérales et médicinales, bains et fontaines de Bourbon-l'Archambault, (18 November 1724), O/1/68, fol. 602–604, AN.

<sup>289</sup> Alizes de Beauplant, provisions d'intendant et maître des eaux minérales et médicinales de St Santin et la Briquetière, (7<sup>th</sup> October 1743), O/1/87, fol. 399, AN. “les Eaux minerales et medicinales de segray proches nôtre ville de Pethiviers en Gatinois, avoient une a propriété très utile au Public, mais dont l'usage devois être conduit par une personne de confiance qui en eut une connoissance parfaite, qu'il [Chicoyneau] estimoit qu'on ne pouvoit proposer un sujet plus convenable que les? (dans le texte) Jean Baptiste Barré docteur en medecine de la faculté d'Avignon et ancien medecin des hopitaux en flandres et en Italie par sa capacité et la connoissance partiliere qu'il a dela vertu et bonnes qualités des Eaux minerales et medicinales ;”

<sup>290</sup> Lettres patentes qui unissent la surintendance des eaux minérales et médicinales du royaume à la charge de premier médecin du Roi, (19<sup>th</sup> August 1709), Ms 2006, Fol. 33, BIU. “leurs effets salutaires ayant engagé nos sujets à s'en servir, et à ceux qui ne peuvent les aller prendre sur les lieux , à les faire voiturier, l'usage en est devenu très commun ; mais plusieurs personnes s'étant ingérées d'en faire le transport et la distribution, nous avons appris qu'ils en vendaient souvent de fausses, ou en faisant voiturier de véritables en trop grandes quantités.”

<sup>291</sup> Medecine surintendance générale des Eaux minérales et médicinales du royaume, (24<sup>th</sup> December 1715), O/1/59, fol. 216 v<sup>o</sup>., AN. “Lettre patentes portant union de la surintendance generale des Eaux minerales et Médicinales du Royaume a la charge de premier Medecin du Roy”. A vincenne le 24 xbre 1715”. Dodart (sr) : lettres confirmant l'union de la surintendance générale des Eaux minérales et de la charge de premier médecin du Roi, (7<sup>th</sup> September 1718), O/1/62, fol. 199, AN. “Lettres portant confirmation de l'union de la surintendance generale des eaux minerales et medicinales du Roy me a la charge de per medecin du Roy en faveur du S dodart”.

<sup>292</sup> “Lettres Patentes du Roy, qui unissent la Surintendance des Eaux Minerales [et] Medicinales du Royaume, à la charge de Premier Medecin du Roy: Donées à Versaille le 19. Aoust 1709,” (François. Rey, chez la Veuve François Muguet et Hubert Muguet, 1709). “L'utilité que nos Sujets retirent des Eaux Minerales & Medicinales qui sont en grand nombre dans nostre

These letters explicitly reinstating an older law are an indicator of the perceived urgency to regulate a loose market. Despite this, reports of fake waters, lousy transporters and inefficient waters continued throughout all the decades.<sup>293</sup> So the letters were written again and again, throughout the eighteenth century. The First physician Sénac (1693–1770) received them twice. The first were in 1752, in the letters that also formalised his right to establish bureaus of distributions.<sup>294</sup> It is not completely clear why Sénac received another set of a decade later, but those letters reasserted his role as the superintendent of waters, and confirmed the various prerogatives this entailed, like giving permits and sanctioning fraud.<sup>295</sup> This long list of Letters patent were then often referenced in later documents. The permits given to distributors often did this in order to invoke a strong legal authority. For example, the permit given in 1770 to Meunier referenced the good foresight of Henri IV for first granting his First physician the superintendency of mineral waters. It then referred to Sénac’s rights, also via his Letters patent, before describing the various rights and duties of Meunier in his new role as the distributor of waters of Vaugirard.<sup>296</sup>

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Royaume, est si considerable, que les Rois nos Predecesseurs se sont efforcez de faire divulguer celles de differentes natures [...]

Nous avons appris qu'ils en vendoient souvent de fausses, ou en faisant voiturer de veritables en trop grande quantité [...]

Voulons & Nous plaist, que la Sur-intendance generale des Eaux Minerales & Medicinales de nostre Royaume, demeure unie & annexée, comme elle a toujourns esté, à la charge de nostre Premier Medecin”.

<sup>293</sup> On illegal trading in the eighteenth century, see: Clarisse Coulomb, “Femmes, pouvoirs et contrebandes dans les Alpes au xviiiè siècle,” *Histoire urbaine* 52, no. 2 (2018).; Daniele Andreozzi, “Respectabilité et confiance au travers de la norme et de la fraude, Le cas de Trieste au XVIIIè siècle,” *Rives méditerranéennes* 49 (2014).; Marie-Thérèse Lorcin, “Un Musée Imaginaire de La Ruse Paysanne La Fraude Des Décimables Du XIVE Au XVIIIè Siècle Dans La Région Lyonnaise,” *Études Rurales* 51 (1973).; W. A. Cole, “Trends in Eighteenth-Century Smuggling,” *The Economic History Review* 10, no. 3 (1958).

<sup>294</sup> Répétition des lettres patentes. Senac (sr) : lettres patentes confirmant pour..., 1er médecin du roi, les privilèges de la surintendance des Eaux minérales et médicinales du royaume, (12th August 1752), O/1/96, fol. 165, AN. “Sr Germain et suite de la com avec permission de tenir le Bureau Général de paris pour la d distribution et par tout ailleurs où il seroit nécessaire d’établir de semblables Bureaux”.

<sup>295</sup> Senac (sieur) : lettres patentes confirmant le..., Premier Médecin du roi et Surintendant des Eaux minérales et médicinantes de France, dans cette surintendance et notamment dans le droit de commettre des personnes pour le transport, la vente et dis, (16th March 1769), O/1/114, fol. 201, AN.

<sup>296</sup> Le Meunier (sieur) lettres patentes confirmant l'autorisation donnée par le sieur Senac, Premier Médecin du roi, au S Meunier a l’effet de pouvoir distribuer les eaux minérales de son jardin à Vaugirard, (10th November 1770), O/1/116, fol. 1109, AN. “Henry quatre de glorieuse mémoire qui a donné le pouvoir de la surintendance à son premier medecin”; “dans les lieux de notre Royaume, ou il se trouveroit des sources, bains, fontaines minerales et medicinales d’y Etablir des Directeurs Inspecteurs Concierges Gardes fontaines Baigneurs Baigneuse et tous autres officiers de capacité requise tant pour la conservation et entretien des fontaine que pour la Distribution fidelle de leurs Eaux”; “nous avons en consequence permis et permettons au S le Meunier de vendre et distribuer l’Eau de la source de son jardin de Vaugirard pourvù que le prix n’Excède pas celui de 8s la pinte a la charge et a condition pour le S le Meunier de permettre

*Drawing the first plans for the Société: a collaborative effort between court physicians and surgeons*

The persistence of complaints despite the reiterated Letters patent sparked the idea of an institution dedicated to watching over the mineral water trade. The person who first brought this suggestion to the king was his First physician Pierre Chirac (1657–1732). In 1724, prior to obtaining this position, he was approached by the First surgeon and his substitute, La Peyronie (1678–1747) and Mareschal (1658–1736), who had been working on a proposal for the creation of an Academy of Medicine.<sup>297</sup> La Peyronie had also on at least one occasion exchanged letters with the previous First physician, and discussed a “project to avoid falsifications” in the trade of mineral waters, which is likely why he was very invested in the topic.<sup>298</sup> In the letter arguing for the creation of this Academy, they stated that numerous ministers had bafflingly created all sorts of academies for the Arts despite this the arts being “the least useful to a State”, and never an Academy of medicine, the most useful of all sciences. In their words: “all this for the pleasures and commodities of life, no attention to preserve it”.<sup>299</sup> To justify the need for reform in the medical field, they mentioned a number of problems with the current state of affairs. One of their criticisms was the lack of rigorous trials in the prescription of remedies. More generally, their grievances lied with the dispersed state of medicine in the kingdom. This caused much knowledge to be lost or never shared because it only resided in the mind of some talented physicians who never bothered to share their empirical discoveries with the rest of their colleagues. Essentially, they argued that medicine was lacking a disciplinary *habitus*, or at least a sense of community.

The proposal admitted that making physicians work together was no small feat. For a variety of reasons, being a physician entailed a fairly isolated lifestyle. Eighteenth-century doctors often passed the trade from father to son.

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la visite de la source des dites Eaux par cela medecins, qui sera commis par notre p medecin afin que la distribution se fasse avec toute l'exactitude convenable et que le public puisse en retir toute l'utilité possible”.

<sup>297</sup> This early attempt at the *Société* is described by Sicard in: André Sicard, “La chirurgie française au XVIIIe siècle,” *Histoire des Sciences Médicales* XXVIII, no. 2 (1994), Communication présentée à la séance du 20 mars 1993 de la Société française d’Histoire de la Médecine. Pierre Chirac’s plans for the institution have also been preserved in the later *Société’s* archives. See: “Mémoire sur la Création d’une Société Royale de Médecine”, (1724), SRM 114A, dossier 1, ASRM.

<sup>298</sup> Eaux minérales: projet pour éviter les falsifications, (1686), O/1/30, fol. 350, AN. “a M de la Reynie 29 octobore. Mr Daquin premier chirurgien medecin du Roy après avoir fait connoistre que beaucoup de gens qui se permettent de vendre des eaux minerales a Paris en donnent de falsifiées et trompent le public...”.

<sup>299</sup> “Mémoire sur la Création d’une Société Royale de Médecine”, (1724), SRM 114A, dossier 1, ASRM. “Il est surprenant que tant de grands Ministres qui ont gouverné la France, qui ont fait tant d’établissements considérables pour avancer la pratique des beaux arts, de ceux là même qui sont le moins utiles a un Etat, n’aient jamais songé a faire perfectionner la pratique de la médecine, qui est sans doute la partie de tous les arts la plus interessante pour l’Etat.”; “tout cela pour l’agrément et les comodités de la vie, nulle attention pour la conserver”.

They temporarily moved to the city in order to study for the doctorate in medicine, but once graduates, due to the high demand for medical services, most of them settled back in their home region and had little time for work outside of their daily practice. This gave them an important social status as men of knowledge, particularly in rural areas. Those specialising in medicine also had a built-in disciplinary domination over surgeons and apothecaries, as they held the highest medical authority.<sup>300</sup> This made for a profession constituted of authoritative, educated and isolated men.<sup>301</sup> With the exception of a few places like Paris or Montpellier, there was a distinct lack of collegiality among physicians.

La Peyronie and Mareschal's solution was to use state incentive to force physicians to work together using a dedicated institution, which would be able to record and test any new remedy or medical practice and best spread it to the rest of the medical field. This needed an act of authority from the king, and would necessitate enlisting diverse medical practitioners such as town doctors, rural physicians and surgeons, hospital workers etc. They feared that short of an inclusive effort, an Academy of the sort would be doomed to fail. But they also argued that such a task did not need to cost the state a fortune. A few physicians dedicated to the task would be sufficient in order to already dramatically improve the situation. It was suggested in the 1724 plan that a mere five talented physicians and a chemist meeting once a week would suffice. They would need some income, but such an expenditure would be "so modest compared to the state."<sup>302</sup> The surgeons La Peyronie and Mareschal decided to present their project to Pierre Chirac, who was very enthusiastic about the idea. The proposal aligned in many ways with his own grievances with the state of medicine in France. Once instigated as First physician in 1730, Chirac attempted to bring his plan for an Academy of medicine to life. Quickly however, his ambition met some expected resistance from the medical community, especially from the Faculty of medicine.<sup>303</sup> His premature death in 1732 meant that the project could not be carried out.<sup>304</sup>

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<sup>300</sup> Jazi Radhi and Shehadeh Kamal, "Séparation de la pharmacie de la médecine," *Revue d'histoire de la pharmacie* 84 (1996), Actes du XXXIe Congrès International d'Histoire de la Pharmacie.

<sup>301</sup> Jean-Pierre Goubert, "The Extent of Medical Practice in France around 1780," *Journal of Social History* 10, no. 4 (1977).; Jean-Pierre Goubert and F. Lebrun, "Médecins et chirurgiens dans la société française du XVIIIe siècle," *Annales Cispalines d'Histoire sociale*, no. 4 (1973).

<sup>302</sup> "Mémoire sur la Création d'une Société Royale de Médecine", (1724), SRM 114A, dossier 1, ASRM. "Cette somme est si modique par rapport à l'Etat".

<sup>303</sup> In the later plans for the *Société*, the Faculty's opposition was not forgotten. This can be seen for example in this letter alluding to the great lengths the Faculty went to in order to suppress Chirac's original attempt: "you would have been the first to spare [the faculty] from the trouble it took in the time of mr Chirac". Lettres des médecins de la faculté de médecine à la SRM, (1781–1782), SRM 114 B, dossier 1–10, ASRM. "vous auriez été le premier à lui épargner la peine qu'elle prit du tems de mr Chirac".

<sup>304</sup> Alexandre Lunel, "Pierre Chirac, premier médecin du roi et le projet inachevé d'une surintendance médicale sur l'art de guérir," *Bull. Acad. Natle Méd.* 189, no. 3 (2005).

## The two *Commissions* (1772–1778)

After Chirac's death, the plans for an Academy of medicine were shelved for some time, and the authority over mineral waters remained in the hands of the First physician alone. With the increasing number of bureaus of distribution throughout the country, the pressure on regulation increased. Complaints of fraudulent trades kept being frequently cited as the main reason to raise the powers of the First physician regarding the mineral water market. Since the First physician was just one man, who did not have a team of subordinates at his disposal to travel from bureau to bureau to check that they were doing good business, issues with the bureaus often went unsolved. Besides, the superintendency over mineral waters was only one of his many responsibilities, one which could easily become secondary when the physician was busy tending to the king's health for example.

Despite the original failure of the first idea for the *Société*, the project was not entirely forgotten. And as the task of being superintendent over the mineral waters of France was transmitted from one First physician to the next, and they were all confronted with the difficulty of administering the ever-growing trade, the temptation to delegate part of the responsibility to a dedicated task-force became more tempting.

### *The Commission for the examination of mineral waters and remedies*

On the 25<sup>th</sup> of April 1772, a major step was taken towards delegating the power of the First physician. Following the request and efforts of the First surgeon La Martinière (1697–1783), a new institution was formed by royal decree.<sup>305</sup> It came to be known as the Royal Commission of Medicine (*Commission* for short), but its full name was Commission royale de médecine pour l'examen des remèdes particuliers et la distribution des eaux minérales, or Royal Commission of Medicine for the examination of specific remedies and for the distribution of mineral waters.<sup>306</sup> This *Commission* was composed of twenty members, coming from different areas of medicine. It was headed by the First physician and the First surgeon. It also included the Dean of the Faculty, a number of court and faculty physicians, as well as other surgeons and apothecaries. The reasons stated for establishing the *Commission* had once again to do with fraud.<sup>307</sup> The declaration made upon its creation specified that mineral waters were an indisputable part of the class of remedies, and that among

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<sup>305</sup> La Martinière was close to his predecessor La Peyronie and took the Academy project from him. Antoine Louis and Frédéric Amiens, Dubois, d', "Eloges lui dans les séances publiques de l'Académie royale de chirurgie de 1750 à 1792," (Londres, New-York, J-B Baillière et Fils, Libraires de l'Académie impériale de Médecine, rue Hautefeuille, 19, 1859), 15.

<sup>306</sup> "Déclaration du Roi, portant établissement d'une Commission royale de médecine pour l'examen des remèdes particuliers et la distribution des eaux minérales, Registrée en Parlement le 28 août audit an," (A Paris, de l'Imprimerie Royale, 1772).

<sup>307</sup> Commission royale de médecine, "Réflexions sur son établissement", (1772), SRM 115A dossier 6, ASRM.

those, they were the most likely to be subjected to “counterfeits” and “embezzlements”.<sup>308</sup>

Despite its claim to control the commerce of mineral waters, the *Commission* did not have to endure conflict with the Faculty of medicine, and the First physician did not receive the kind of pushback that Pierre Chirac once endured. This was mostly because the *Commission* was in a sense an extension of the Faculty. The Dean was one of its most important representatives, in addition to the *Docteurs-régents*, which was the name given to graduates of the Faculty of medicine of Paris who constituted many of the members. Besides, the *Commission* did not have a statute of independence, or any activity that could be mistaken for attempts at teaching medicine, something that the Faculty was notorious for quickly hunting down.

The *Commission* was scheduled to meet once a month, but the records show that it actually met almost every week to discuss the various matters at hand.<sup>309</sup> The king’s declaration which created it voided all previous permits that had been handed for the distribution of remedies or waters, with the exception of the ones that received Letters patent. This meant that for the first years of its operation, the *Commission* received applications from people asking to be granted a new permit to distribute mineral waters, or to be inspectors of the bureaux. This took up a significant part of the minutes of the weekly meetings.

Beyond the simple issue of permit renewal, matters related to mineral waters came up regularly. In the year of its foundation, the new institution felt the need the acquaint itself better with the map of mineral waters in France. With that in mind, the *Commission* nominated their colleague Joseph Raulin, the Ordinary physician and asked him to make an inventory of the mineral waters sold in Paris. He was also tasked with the inspection of the springs and the transport to the bureaux. Several books came out of this endeavour. On many occasions, Raulin described the state of disarray he encountered at the spas, and the prevalence of corruption in the systems of transport, but he also described the impressive offer of mineral waters that could be found just in the Paris bureau.<sup>310</sup>

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<sup>308</sup> Simonetta, “La Société Royale de Médecine 1776–1793.” “Comme la distribution et le commerce des eaux minérales entrent nécessairement dans la classe des remèdes particuliers que cette partie est encore et plus que toute autre susceptible de grandes contre-façons, de malversations, qu’il était prouvé qu’il s’en était commis un grand nombre sous l’administration du premier médecin, sa Majesté voulut que l’examen et l’inspection des eaux minérales fussent également confiées à la Commission qu’elle établissait par sa déclaration du 25 avril 1772”.

<sup>309</sup> Papiers de la Commission pour l’examen des remèdes particuliers et la distribution des eaux minérales, SRM 111–113 and SRM 115A, ASRM.

<sup>310</sup> Raulin’s subsequent publications regarding mineral waters: Raulin, “Exposition succincte des principes et des propriétés des eaux minérales, qu’on distribue au bureau général de Paris.”; Joseph Raulin, “Traité analytique des eaux minérales en général, de leurs propriétés et de leur usage dans les maladies,” (Chez Vincent, Imprimeur-Libraire rue des Mathurins, Hôtel de Clugny, 1772).; Joseph Raulin, “Traité des eaux minérales de Verdusan, connues sous le nom d’eaux minérales de Castera Vivent, avec leur analyse, leurs propriétés & leur usage dans les

Overall, the first few years of operation of the *Commission* point to a fairly diligent attention to its duties, especially to the renewal of permits. In 1777 for example, the *Commission* deliberated on the administration of the waters of Saint Martin.<sup>311</sup> The members decided that the waters had to be given for free to the poor and to soldiers. They also officially recognised the waters as salutary and granted Chevrier the right to distribute them. The members fixed the price of those waters at 2] a pint. They added as a requirement that each shipped pint had to be stamped with the *Commission*'s seal, in the hope that it would instil greater trust for buyers.

The *Commission* also worked to resolve local issues related to the springs. Lengthy letters with sometimes not terribly cooperative spring owners or bureau tenants can easily attest to that point.<sup>312</sup> This conflict resolution, as well as the handing out of permits, were done in shorter delays than in the days of the First physician. The *Commission* had the power to hand out permits, the time to carefully discuss several applications, and the will to write the people working with the springs all over the kingdom.

This does not mean however that it escaped critique altogether. Some accounts point towards the *Commission* becoming less diligent as the years went by. In a surprisingly aggressive tone, La Martinière, one of the original founders of the *Commission*, wrote to the king in 1778 to let him know of the many problems that plagued the institution.

One sells, I dare say, the life of citizens to the first pretender who, by paying in proportion to his lack of merit, obtains without the smallest difficulty, a privilege for the distribution of remedies.<sup>313</sup>

This strong accusation of corruption pinned the responsibility of this state of corruption on the late First physician Sénac, who despite passing away two years prior to the establishment of the *Commission*, had instilled a climate which tolerated bribery in his time, poisoning future attempts at proper regulation.

#### *Vicq d'Azyr and the Commission for the study of epidemics*

To complicate this institutional history, I must now mention the creation of another *Commission*, which had nothing to do with mineral waters but much

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maladies, fait par ordre du gouvernement," (Chez Valade, Libraire, rue St. Jacques, vis-à-vis celle des Mathurins, 1772).

<sup>311</sup> Minutes of the *Société* on the waters of Saint Martin, (1777), SRM 92 B, dossier 39, ASRM.

<sup>312</sup> See for example the situation between a bureau tenant, an inspector and a physician all accusing each other of various betrayals and conspiratorial behaviour over several years, with the *Commission* attempting to appease the situation: Tardy au bureau du Puy, 37e assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM.

<sup>313</sup> Correspondence from La Martinière to the king, (1778), SRM 114A, dossier 10, ASRM. "On vendois, j'ose le dire, la vie des citoyens au premier affronteur qui, en payant à proportion de son démérite, obtenois sans la moindre difficulté, un privilège pour la distribution des remèdes".

to do with the creation of the *Société*. In the early 1770s, following an epizootic which killed a large amount of livestock, a young physician named Félix Vicq d'Azyr (1748–1794) was sent from Paris to study the disease and hopefully help curb its spread.<sup>314</sup> Having recently graduated as *Docteur-régent* from the faculty, Vicq d'Azyr undertook an ambitious project which aimed at collecting information on epidemics and epizootics across the kingdom, by the means of a questionnaire.<sup>315</sup> The many responses he received following that initial survey likely led him to realise how much information physicians and local informants were willing and able to share about the medical state of their own regions.<sup>316</sup>

This experience heavily informed Vicq d'Azyr's education as a physician. He went on to have a very successful career, especially as an anatomist.<sup>317</sup> He was nominated at the Academy of Sciences a mere four years after he started to teach anatomy. During his initial survey of 1774–1776, he also became close to the physiocrat Turgot (1727–1781), whom had been appointed Controller General of finances in 1774.<sup>318</sup> Thanks to this close collaboration, Vicq d'Azyr was able to be part of the creation of the Commission de médecine à Paris pour tenir une correspondance avec les médecins de province pour tout ce qui peut être relatif aux maladies épidémiques et épizootiques, or Commission of medicine in Paris to hold a correspondence with the physicians of provinces for all that can be related to epidemic and epizootic diseases (regrettably also called *Commission* for short by its members). This second *Commission* was constituted of six physicians, in addition to Vicq d'Azyr, who served as its perpetual secretary. During his time as secretary of this *Commission*, Vicq d'Azyr made use of the existing network of respondents to his survey to gain insight on the medical topography of the kingdom.

In the year 1776, the Ordinary physician Lassone (1717–1788), dissatisfied with the work of the Royal *Commission* of medicine, enlisted the help of Vicq d'Azyr in order to lay down plans to create a brand-new institution, with extended prerogatives and academic ambitions, which would finally solve a number of lingering issues in the field of medicine, among others, the rampant

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<sup>314</sup> Jean Paul Desaive et al., *Médecins, climat et épidémies à la fin du XVIIIe siècle*, vol. 29, *Civilisations et Sociétés*, (Éditions EHESS, 1978), 9–22.

<sup>315</sup> Thomas Marion, "Entre médecine et politique : Félix Vicq d'Azyr et la lutte contre la peste bovine sous l'Ancien Régime," *Bulletin d'histoire et d'épistémologie des sciences de la vie* 19, no. 1 (2012), 12. On the survey itself: Jean Meyer, "Une enquête de l'Académie de médecine sur les épidémies (1774–1794)," *Annales. Histoire, Sciences Sociales* 21, no. 4 (1966).

<sup>316</sup> This is the hypothesis of Moussy's work: Hugues Moussy, "Les topographies médicales françaises des années 1770 aux années 1880, Essai d'interprétation d'un genre médical" (Université Paris 1 - Panthéon Sorbonne, 2003).

<sup>317</sup> Mandressi, "Félix Vicq d'Azyr: l'anatomie, l'État, la médecine."

<sup>318</sup> On Turgot, see: Peter Groenewegen, *Eighteenth-century Economics: Turgot, Beccaria and Smith and Their Contemporaries* (Routledge, 2002).; Emma Rothschild, "Commerce and the State: Turgot, Condorset and Smith," *The Economic Journal* 102, 414 (1992).

problems in the commerce of remedies.<sup>319</sup> This new institute would be called the *Société Royale de Médecine*. The collaboration with Vicq d'Azyr also came with the support of Turgot.<sup>320</sup> Lassone was familiar with the medical world of Paris, but he also had his own prestigious position as Ordinary physician. He could therefore connect the reforming intentions of the minister Turgot and the world of the medical elite willing to engage in a new project of the sort.<sup>321</sup> On the 29<sup>th</sup> of April 1776, the king created the very first version of the *Société*, by *Arrêt du Conseil*. This was a very simple institution in those early years. But as this was by then the third Paris-based medical institution to be formed in the 1770s, it became clear that a merger was on the horizon.

## 1778, a decisive year for the *Société*

As soon as the *Société* received its first signs of approbation from the king, a plan was formed to merge the *Commissions* in a new and improved version of the *Société*. Taking effect in 1778, this signed the end of the two *Commissions*.<sup>322</sup> A transfer of statutes and archives was done officially, by Letters patent, so as to minimise the loss of information during the move.

His Majesty having by his edict of the month of august 1778 judged it right to remove the Royal commission of medicine [...] and to assign to the société Royale de médecine [...] the functions with which the aforementioned commission was charged relatively to the examination of new remedies and to the distribution of Mineral and Medicinal waters, he believes he ought to take

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<sup>319</sup> The criticisms of corruption mentioned earlier were common, and the First physician Lieutaud had plans of his own to expand the *Commission* for the study of remedies to a wider institution capable of facing the challenges of legislation. See: Chaussinand-Nogaret, “Nobles médecins et médecins de cour au XVIIIe siècle.”

<sup>320</sup> The involvement of Turgot in the creation of the *Commission*, and later the *Société*, aligns with his work with the Physiocrats. Mineral waters and other natural remedies constituted potential applications of the physiocrats’ driving ideal of nature producing products and value. The waters, which were often said to come from the ‘entrails of the earth’ fitted this kind of economic thought. See: John Shovlin, “Regenerating the Patrie: Agronomists, Tax Reformers, and Physiocrats,” in *The Political Economy of Virtue: Luxury, Patriotism, and the Origins of the French Revolution* (Cornell University Press, 2006).; Steven G. Medema and Samuels J. Warren, eds., *A History of Economic Thought, The LSE Lectures* (Princeton University Press, 1998).

<sup>321</sup> Turgot was also the founder of the *Société d’Agriculture*. The *Société de Médecine* had similar ambitions to this earlier institute. Léopold Moulin, “Surveiller et Prévoir : climats et maladies selon la Société Royale de Médecine (1776–1793)” (*Mémoire de Civilisation des Temps modernes Master 2 Université Paris-Sorbonne*, 2016–2017).

<sup>322</sup> From this point onwards, I will use the shorthand “*Commission*” to refer to the “Royal Commission of Medicine for the examination of specific remedies and for the distribution of mineral waters”, as it is the *Commission* which is most important to the present study.

measures for the conservation of the records of the aforementioned commission.<sup>323</sup>

The conservation of records was especially important because of the vast survey on mineral waters that had been undertaken by the *Commission* was precious data that the new *Société* was eager to keep. This union simplified the Parisian medical landscape and centralised different responsibilities into a single institution.

The reasons behind the creation of the *Société* were rooted in the criticisms of stagnation that had been levied against medicine for decades. The Faculty of medicine of Paris was an active centre for medicine, and so were a number of other faculties, chiefly the faculty of Montpellier. But these institutions were focused on education, and their fierce independence from state power made them difficult to steer towards topical issues. There was therefore a gap in the institutional landscape which could be filled by an institution oriented towards the improvement of medical practice. In a document outlining the necessity of the creation of the *Société*, one of its members said that the British, from whom one should not “necessarily adopt all tastes”, had advanced far ahead of French medicine thanks to their open mind towards academic structures.<sup>324</sup> The author lamented the number of academies of medicine that could be found in England, not only in London but also in other cities. In comparison, France did not have a single medical Academy, not even in Paris.

This focus on making medicine progress became one of the foundational pillars of the young *Société*. While it had been given the name of *Société*, in its actions, self-perception and scientific production, it was closer to an Academy of medicine. Many members also held chairs at the Academy of Sciences, and they generally entertained good relations with the Academy. The *Société* was seen as a place in which to apply the theoretical knowledge drawn at the Academy to the practical field of medicine. Upon its creation, three functions were described as summarising the main objectives of the *Société*.

1. The establishment of a correspondence or “communication of lights”.<sup>325</sup>

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<sup>323</sup> “Suppression de la Commission”, (August 1778), SRM 114A–B, dossier 1, ASRM. “Sa Majesté ayant par son édit du mois d'aout 1778 jugé a propos de supprimer la commission Royale de médecine qui avois été établie par la déclaration du 25 avril 1772 et d'attribuer à la société Royale de médecine institutée par le même édit, les fonctions dont la d. commission étoit chargée relativement a l'examen des remèdes nouveaux et à la distribution des eaux Minérales et Médicinales, elle crois devoir prendre des mesures pour la conservation des registres de la d. commission”.

<sup>324</sup> “Observations sur l'établissement d'une Société de Médecine”, (ca. 1776), SRM 114A, dossier 4, ASRM. “les anglois dont il ne faut pas forcément adopter tous les goûts ont fait des progrès remarquables en médecine”.

<sup>325</sup> Ibid, “communication de lumières”.

2. The protection of the French provinces against epidemics thanks to a prompt response to emergencies.
3. The insurance that remedies and mineral waters sold on the market were salutary and safe.

These three missions highlight the importance of the administration of mineral waters at the *Société*. Though it was not its sole area of interest, it was a primary concern for its members. These objectives also underlined the contrast in missions between the *Société* and the faculties.<sup>326</sup> The *Société* was decidedly unconcerned with education. It provided no diplomas, wrote no manuals and did not hold public courses. Its founders stated that since medical research was such an expensive activity to conduct, it should be the task of a separate entity from the University to pursue it. The prime example which was given in order to support this argument was the cost of chemical analysis in the appraisal of mineral waters. Routinely funding analysts was too high a cost for the faculties to be able to take on, thus justifying the need for a state funded *Société* that could absorb these crucial expenses.<sup>327</sup>

These reasons had justified a fuller endorsement from the king. On August 29<sup>th</sup> 1778, the *Société Royale de Médecine* was granted its Letters patent. These letters were much more formal and prestigious than the initial *Arrêt* which had led to the first creation of the *Société*. They were read at the Salon de l'Infante at the Louvre, where the *Société* held its meetings. Those letters established the structure of the institution, with the first article stating "The *Société Royale de Médecine* will be under our special protection." and subsequent ones deciding on the number of members and their prerogatives.<sup>328</sup>

The recruitment age for members of the *Société* skewed young compared to other institutions of this kind. Around two thirds of the members were under forty years of age when they joined. Most of them were well-off, but most did not come from noble rank. Some struggled financially, just about able to afford their education at the Faculty. But generally speaking, the associates were a part of the local elite. The vast majority held the title of *Docteur-régent* from the Faculty of medicine of Paris, but few of them were Parisians by birth. All of the Ordinary Associates resided in Paris though, as it was a prerequisite to be able to attend the bi-weekly meetings. Being part of the *Société* did not automatically come with a full-time employment, so most Associates had a medical practice elsewhere, either private, at court, at the Faculty, or in the

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<sup>326</sup> These objectives were in large part taken from the previous body of *Commissions* that came before it. This also shows that the absorption of both *Commissions* into the *Société* was not simply administrative. Their main duties both became part of the mission statement of the *Société*.

<sup>327</sup> "Observations sur l'établissement d'une Société de Médecine", (ca. 1776), SRM 114A, dossier 4, ASRM.

<sup>328</sup> "Lettres patentes du Roi, portant établissement d'une Société Royale de Médecine: données à Versailles au mois d'Août 1778," (de l'imprimerie de P. G. Simon, 1778). "Article Premier. La Société Royale de Médecine sera sous notre protection spéciale."

Parisian hospitals.<sup>329</sup> The Letters patent also reserved a small space for members who were not physicians altogether, or controversially, for members who did not receive their doctorate from the Faculty.<sup>330</sup>

A new set of Letters patent were written for the *Société* in 1780. Those new letters were intended to formalise the regulations that the *Société* was going to uphold.<sup>331</sup> The choice of members, and especially the absence of surgeons and apothecaries among the Associates, was the cause of some conflict with the First surgeon. He was not keen to see the administration of remedies be given to the sole authority of physicians.<sup>332</sup> He wrote a memoir in which he detailed a number of issues in what he saw as an imperfect transfer of privileges from *Commission* to *Société*. The *Société* refused to have surgeons amongst its members, and it would not be until the end of the next decade that talk of including surgery in its ranks was ever going to come up again. This attack was however quickly deflected. The *Société* responded by asking how the First surgeon, “jealous to conserve his rights and those of Surgery”, could resolve to the unthinkable attack of attempting to “strip the First physician of a right given to this position since the Reign of Henry IV”.<sup>333</sup> By saying this, the *Société* Associate referred to the superintendency over mineral waters, which indeed, had been the given right of the First physician for centuries at this point. The weight of tradition gave the *Société* a strong legal argument for its claim of authority on remedies, which allowed it to brush this critique aside. A similar conflict took place with the Collège de Pharmacie, which was also resolved quite fast.<sup>334</sup>

A few issues arose when some of the people who had received permits from the *Commissions* complained about being blind sighted by the sudden change in authority. The owner of the waters of Saint Martin wrote to share his confusion, and wondered if the permit he had obtained just a year prior had been rendered invalid by the change of institution.<sup>335</sup> Despite being created with intents of simplifying medical research, the creation of the *Société* also had immediate adverse consequences for the trade of mineral waters and remedies,

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<sup>329</sup> Simonetta, “La Société Royale de Médecine 1776–1793.”

<sup>330</sup> Fourcroy was the most notorious example. Claude Viel, “Antoine-François de Fourcroy (1755–1809), promoteur de la loi de Germinal an XI,” *Revue d'histoire de la pharmacie* 91, 339 (2003), 380–381.

<sup>331</sup> Lettres Patentes, (29<sup>th</sup> January and 1<sup>st</sup> February 1780), SRM 114A–B, dossier 11, ASRM.

<sup>332</sup> The surgeon in question is not named in the letter, but it seems like it can only be La Martinière, which is somewhat at odds with his other praises for the foundation of the *Société* and the suppression of the *Commission*. See: “Observation sur le mémoire dans lequel le premier chirurgien du roi s'élève contre le projet de lettres patentes de l'établissement de la SRM”, SRM 114A–B, dossier 12, ASRM.

<sup>333</sup> *Ibid*, “Comment M le per Chirurgien qui est avec raison si jaloux de conserver ses droits et ceux de la Chirurgie, se détermine-t-il d'après au pareil sophisme à vouloir [illisible] dépouiller le pre Med. d'un droit attribué à cette place depuis le Regne de Henry IV.”

<sup>334</sup> Collège de pharmacie, Polémique avec la Société royale de Médecine, (ca. 1780), SRM 115A dossier 8, ASRM.

<sup>335</sup> Correspondence from the owner of the waters of Saint Martin to the *Société*, (1777), SRM 92 B, dossier 39, ASRM.

since all permits had been once again rendered void. These complaints were addressed by the *Société*, and especially by Vicq d’Azyr, its new perpetual secretary. He wrote back to the plaintiffs, outlining the procedures which they had to undertake in order to obtain new certifications. This conflict, though important, posed no existential threat to the *Société*.

The same could not be said about the complaints which were made by the Faculty of medicine. As soon as the plans for the *Société* were made public, a momentous amount of uproar came from the Faculty which tried to shut the project down. The *Société* quickly added to the fire, by accusing the Faculty of incompetence and over-conservatism. This led to a long and active controversy between the two institutes, which ended in a complete severance of relations, despite their shared interest in medicine and many overlapping members. This controversy was rich and eventful, and an essential part of the early history of the *Société*.

## The heated feud between the Faculty of Medicine and the *Société* (1778–1779)

The conflict between the new ambitious *Société* and the old Faculty was in many ways a predictable one. Much of the tension revolved around the question of medical authority. But it also reached into more unexpected topics of discord, including the position of chemistry within the teaching of medicine, as well as the status and administration of mineral waters. The two sides can be succinctly depicted as follows.

The *Société* was a brand-new institution which was, at the time of the conflict, just about to receive its legitimatising Letters patent. It had the right to exclusively grant permits for the sale of mineral waters and remedies in the kingdom through the First physician. In other words, the *Société* had become the new superintendent over mineral waters. The institution was also staffed by young and sometimes controversial scientists, most of them physicians.

The Faculty of Medicine of Paris on the other hand, was a much older institution. It was amongst the first universities of medieval Europe. Since its medieval creation, it held the exclusive right to grant degrees in medicine, especially the coveted title of *Docteur-régent*. Its status gave it a large amount of independence, making it historically difficult to confront. Throughout the eighteenth century, it was routinely accused of excessive conservatism. Unsurprisingly, it saw the intrusion of a brand-new institution on its territory with a lot of suspicion.

This rivalry turned all out fight has been described in the secondary literature as a polemic “worthy of the fourteenth century”,<sup>336</sup> alluding to the

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<sup>336</sup> René Taton, ed., *Enseignement et diffusion des sciences en France au dix-huitième siècle* (Paris: Hermann, 1986), 211.

medieval structure of the Faculty and its habit to quarrel in sometimes unbounded proportions. As the *Société* quickly came to realise, their ambitious mission of propelling medical research into modernity by gathering talented physicians in a shared establishment was met with extreme scepticism from the Faculty, which claimed to already fill that role and did not appreciate the underlying jab at its traditionalist ways. An archive was kept documenting the full extent of the altercation between *Société* and Faculty, containing no less than 150 pages of letters, memoirs and other pamphlets, eloquently titled “dis-entangling of the SRM [*Société*] with the faculty of medicine”.<sup>337</sup>

### *The Faculty and its resistance to change*

The Paris Faculty of medicine was first established in 1215. Its structure was comparable to other medieval universities: headed by a Dean but otherwise generally un-hierarchical in structure. The foundation of the various faculties of medicine during the twelfth century helped to formalise the separation between physicians, surgeons and pharmacists. The authority on remedies remained hazily distributed between those three main medical branches and the vernacular world of home medicine, but the Faculty held the monopoly in the teaching of theoretical medicine, as well as on the deliverance of university titles obligatory for any legal medical practitioner.<sup>338</sup> This rough division of authority in three branches was still in place in the early modern period. Faculties also still held a large administrative autonomy, and a complete financial independence from the state. This basic structure remained almost unchallenged until the seventeenth century.<sup>339</sup>

The Faculty of medicine of Paris had a few specificities when compared to the other medical faculties. One of these quirks was that all of its graduate doctors automatically were granted the title of *Docteur-régent*, which allowed them to teach upon receiving their doctorate. After graduating, most students taught at the Faculty for a period of about a year.<sup>340</sup> The quality of the teaching at the Faculty was not without its critics. The course literature for example was greatly outdated. In 1651, a commission for the re-evaluation of the quality of the course literature was formed, and it took a full one hundred years in

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<sup>337</sup> Correspondances diverses relatives aux demêlés de la SRM avec la faculté de médecine et notes, SRM 114B, dossier 1–10, ASRM. The Faculty of Medicine also kept some documents pertaining to the fight with the *Société* which are used in this section, but its records are less comprehensive.

<sup>338</sup> On the history of the authority between the branches of medicine: Philip Rieder and François Zanetti, eds., *Materia Medica, Savoirs et Usages des Médicaments aux Époques Médiévales et Modernes* (Genève: Librairie Droz, 2018); Paul Delaunay, *La vie médicale aux XVIe, XVIIe et XVIIIe siècles* (Slatkine, 2001).

<sup>339</sup> René Grevet, “La Réforme Des Études En France Au Siècle Des Lumières,” *Revue Historique des Armées* 601, no. 1 (1997).

<sup>340</sup> Isabelle Coquillard, “L’émergence d’un groupe professionnel : les docteurs régents de la faculté de médecine de Paris au xviii<sup>e</sup> siècle,” in *Histoires de nobles et de bourgeois: Individus, groupes, réseaux en France. xvii<sup>e</sup>-xviii<sup>e</sup>*, ed. Jean Duma (Nanterre: Presses universitaires de Paris Nanterre, 2011).

order to decide on a new syllabus. All courses were taught in Latin which, by eighteenth-century standards, was becoming a bit of an oddity.<sup>341</sup> The Faculty was also very reactionary in its approach to curriculum division. It fully endorsed the separation between the different medical branches and would often adopt somewhat of a condescending rhetoric towards apothecaries and surgeons. Around the same time as the feud with the *Société*, the Faculty also had a run-in with the Collège de Pharmacie, an organisation in charge of teaching the art of pharmacy to future apothecaries.<sup>342</sup> An entire memoir was written by the Faculty arguing for the endurance of the separation of the different arts of medicine, stating: “it is by fulfilling the duties of one’s state, that one must seek to be useful to Society. otherwise, all great words of goodness, and of public utility, are nothing but a vain display which is only used to cover motives of interest, or ambition”.<sup>343</sup> This kind of statement celebrating the separation and hierarchy between the different medical arts was only ever written by physicians, who happened to be at the top of the hierarchy between the branches, and who all received their educations from faculties.

This frozen view of how medicine should be divided led to criticisms that became increasingly difficult to fend off. In the few decades preceding the revolution, the Faculty was in rough shape. Its independence was also not always to the liking of the monarchy. On occasions, the state punished the Faculty for its unyielding attitude. When the architect Soufflot made plans for rehousing all of the Parisian centres for education, the Faculty was denied access to the new buildings that had been built for it, and it was instead relegated to a more temporary residence from which it could potentially be expelled, forcing it in a state of precariousness and financial fragility.<sup>344</sup>

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<sup>341</sup> “Mémoire ou l'on examine ce que la Faculté de Medecine pourrois faire de plus avantageux pour le public et pour elle dans sa position actuelle”, (ca. 1778), SRM 114B, dossier 1–10, ASRM. “Oserai je le dire ? Pourquoy dans ces examens publics excluerois on l'usage de notre langue ? Manque-t-elle d'expressions et de tournures pour s'exprimer clairement sur toutes sortes de matieres ?”

<sup>342</sup> Notably, the point of contention with the apothecaries was related to a course in chemistry that was taught as part of the general training of apothecaries. The Faculty member who authored the memoir in contention claimed that the Collège de Pharmacie was just a charity house, and they should not try to rise above their lot by teaching a field of knowledge that they could not hope to master. This point is quite telling of the willingness of the Faculty to contain apothecaries to a role of merchants rather than one of *savants*. It also shows an ambivalent attitude from the Faculty, itself very slow to integrate chemistry in its curriculum, but equally unhappy to see others in the medical field take on the task. Memoir on the opposition to the chemistry course of the apothecaries, (undated), Registre 10, BIU.

<sup>343</sup> *Ibid*, “c'est en remplissant les devoirs de son etat, que l'on doit chercher a se rendre utile a la Société. autrement, tous les grands mots de bien, et d'utilité publique, ne sont qu'un vain étalage qui ne sert qu'a couvrir des motifs d'interest, ou d'ambition, qu'il est souvent aisé de reconnoître, pour peu que l'on sonde le coeur de ceux qui en parent leur langage.”

<sup>344</sup> Taton, *Enseignement et diffusion des sciences en France au dix-huitième siècle*.

*Irreconcilable structures of the two institutions: the origins of the conflict*

Unlike the independent Faculty, the *Société* was a product of state power, and it received unwavering support from the controller of Finances Turgot and later his successor Necker (1732–1804). The work of the *Société* has even been described in secondary literature as a passion project of the Necker administration. The Associates were housed for free in the very comfortable Pavillon de l'Infante in the Louvre.<sup>345</sup> The *Société* had ties with eleven other faculties throughout the French kingdom, so its rivalry only ever concerned the Paris Faculty of medicine, and was overall a very Parisian affair.

Although the bulk of the controversy occurred in 1778–1779, the opposition between the two institutions was baked in the very first attempt to create the *Société*. When Pierre Chirac attempted to reunite the traditionally separated arts of medicine and surgery, the Faculty took this suggestion as a direct attack against its prerogatives and Chirac faced immediate opposition.<sup>346</sup> Théodore Baron d'Hénouville (1715–1768), Dean of the Faculty at the time, turned out to be a fervent opponent of his plan and the core idea underpinning it. In response, Chirac had some rather unkind words regarding work at the Faculty. He blamed it for what he saw as the desolate state of the medical landscape, accusing it of “non-observance of regulations” which he argued was motivated by greed, leading the Faculty to allow just about anyone to graduate, whether “literate” or “illiterate”, providing they could pay the entry fee. This in turn, he argued, led physicians to practice “like miserable charlatans” due to their eminently dated education.<sup>347</sup> Accusing the Faculty of greed at the expense of the public in this manner was evidently not well received, but it was the proposed reform of the medical body that caused the most uproar. Eventually, this resistance coupled with Chirac's death, caused the first abandonment of the *Société* project. But the Dean's role in sinking this first attempt would not be easily forgotten.

One of the first concrete objections that the Faculty expressed against the new *Société* was a monetary one. The *Société* was enjoying generous funding, and the Faculty argued that a brand new institution should not be trusted with this much resources. Upon hearing about an early version of the project, a professor at the Faculty, Pajon de Moncets, wrote to complain about the

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<sup>345</sup> Maurice Genty, “Les dernières années de la Société royale de médecine : 1789–1793,” *Le progrès médical* 14, no. 7 (1937).

<sup>346</sup> Lunel, “Pierre Chirac, premier médecin du roi et le projet inachevé d'une surintendance médicale sur l'art de guérir.”

<sup>347</sup> *Ibid*, 1730–32, “Projet pour augmenter le nombre des médecins et les moyens d'en former d'excellents (s.d.).” “L'inobservation des règlements et l'avidité du gain qui porte les professeurs de la plupart des facultés de médecine à admettre aux grades tous ceux qui se présentent, lettrés, illettrés, sans certificat d'étude de trois années réglées par l'édit de 1707, tout cela fait qu'il y a très peu de médecins qui aient saisi toutes les parties nécessaires à la pratique de cette importante profession, ils ne l'exercent que comme des mi-sérables empiriques, et usant de l'anarchie qui règne dans les trois professions qui forment le corps de la médecine, et empiétant sur les droits des apothicaires, ils administrent comme des remèdes secrets et les plus précieux, ce qu'il y a de plus commun, qu'ils vendent très chèrement aux malades.”

attribution of funds to the new institution, stating that “one might draw a higher profit from the spending that the government is willing to make” by simply allocating those funds to the Faculty itself. After all, the Faculty had always loyally answered “the questions that the State has wanted to ask for the last six hundred years”.<sup>348</sup> Despite rather obvious jealousy from the financially struggling Faculty, Moncets did not believe that the whole plan for the *Société* should be scrapped. He commanded the nomination of Vicq d’Azyr as secretary to such an organisation, and simply insisted that it should be kept under the watch of the Faculty.

### *First points of contention*

Moncets’ attitude was not uncommon. Not all members of the Faculty engaged with the rivalry immediately. A few tried to remain neutral, wishing to not make enemies out of either institution. Some for example, refused to join the ranks of the *Société* but conceded that its aims were “praiseworthy”.<sup>349</sup> Another physician, Jean-Jacques Paulet (1740–1826), declined a paid position at the *Société*, citing a misunderstanding of the situation, as he had assumed that the Faculty would be governing the new institution. He argued that his oath to protect the rights of the Faculty could not be reconciled with active support of the *Société*.<sup>350</sup> His tone was however far from incendiary. The internal communications at the *Société* indicated that the situation was resolved peacefully, and that Vicq d’Azyr simply cancelled Paulet’s annuity as per their agreement.

But quickly, these gestures of neutrality were overshadowed by much more aggressive ones. A year before the Letters patent were even proclaimed, the founders of the *Société* authored a paper titled “Memoir where it is examined what the Faculty of Medicine of Paris could do that would be more advantageous for the public and for itself in its current position.”<sup>351</sup> This paper was boldly sent straight to the Dean. One of its very first lines read “with the exception of a couple discoveries, in anatomy and in chemistry, which are more due to the royal academy of sciences, and to a couple Physicists, rather than to the works of its school and its Doctors, Medicine is still more or less at the same point than it was two hundred years ago”.<sup>352</sup> Accusing the Faculty of

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<sup>348</sup> Correspondence from Pajon de Moncets to Lassone, (1776), SRM 114B, dossier 1, ASRM. “je vous observe qu’on pourroit tirer un plus grand profit des depences que le gouvernement veut bien faire, que la faculté a jusqu’icy repondu sans aucun interest aux questions que l’Etat a bien voulu lui faire depuis six cent ans”.

<sup>349</sup> Correspondence to the *Société*, (1778), SRM 114B, d1–10, pièce 5, ASRM. “louable”.

<sup>350</sup> Correspondence from Paulet to the *Société*, (1780), SRM 114B, dossier 5, pièce 5, ASRM.

<sup>351</sup> “Mémoire ou l’on examine ce que la Faculté de Medecine pourrois faire de plus avantageux pour le public et pour elle dans sa position actuelle”, (ca. 1778), SRM 114B, dossier 1–10, ASRM.

<sup>352</sup> Ibid, “à l’exception de quelques découvertes, en anatomie et en chimie, qui sont plutôt dues à l’académie royale des sciences, et à quelques Physiciens, qu’aux travaux de son école et de ses Docteurs, a\* la Medecine est encore à peu près au même point qu’elle étois il y a deux cent ans;”.

conservatism might have been a common trope but nevertheless, this was an audacious accusation to send to the head of the Faculty. The memoir also criticised the lack of practical education at the Faculty, stating that learning by practicing was the best way to “preserve the young Physicians from the mistakes that inexperience makes inevitable!”<sup>353</sup> Some later passages were just as unambiguously critical:

soon those who will have stayed simple members of the faculty will be regarded by the public as simple scholastics and faultfinders, thereby as far below those who will have the honour of being members of the Société Royale.<sup>354</sup>

The *Société* did more than writing vindictive texts, it also wrote pieces that aimed at defending its own existence, including a memoir in which it listed the reasons that had brought it to life. One urgent critique that it needed to address was the accusation that the *Société* was rivalling the Faculty by engaging in illegal teaching activities. This attack was based in the publications of the *Société*, and its weekly meetings, which could potentially be viewed as equivalent to writing manuals and holding seminars. This would have been, if valid, grounds to dissolve the institution. The *Société* argued in the memoir that only a bad faith reading of such activities could lead anyone to think that publishing works in the field of medicine equated with an attempt at secretly teaching students. None of the books authored by *Société* members had a pedagogical incline, and as for the claim of the meetings being teaching groups, it was easily disproved by showing who went to these meetings; most attendees already had a diploma in medicine.

Eventually, that case was dropped, and instead the Faculty sought to put pressure in a different way. It requested to be granted some of the *Société*'s prerogatives, not because it was legally entitled to such rights, but rather because common sense suggested that it was the best candidate for it. In particular, the Faculty believed that it ought to be given control over the administration of mineral waters. The *Société* answered: “It is no longer the law that the faculty invokes; but it announces its regret not to be charged of the [...] examination of Remedies with Permits, the inspection and analysis of Mineral Waters”.<sup>355</sup> This kind of claim was easier to argue against, as the *Société* was

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<sup>353</sup> Ibid, “Il faut même qu'aux leçons d'usage elle en ajoute de pratique dans les hopitaux. Elle seroient si utiles pour préserver les jeunes Medecins des fautes que l'inexpérience rend inévitable !”

<sup>354</sup> Ibid, “Si [la faculté de médecine] n'adopte pas [la réforme proposée] dans toutes ses parties, si elle ne captive pas tous les suffrages en se donnant la meilleur forme possible, la société Royale conservera sa correspondance. La faculté n'aura que les restes, et par là ses travaux étant fors inferieurs à ceux de la société, bientôt ceux qui seront demeurés simples membres de la faculté ne seront regardés par le public que comme des simples scolastiques et des ergoteurs, parconséquent comme fort au dessous de ceux qui auront l'honneur d'être membres de la Société Royale.”

<sup>355</sup> Ibid, “Ce n'est plus au droit que se revendique ici la faculté ; mais elle annonce au regret de n'etre pas chargée des objets qui doivent occuper la société. Ces objets sont l'examen des

legally on secure ground. The Faculty had no legislative recourse to claim administrative rights over mineral waters.

Often, the Letters patent would be brought up, in order to deny a right to the *Société*, or simply to make a point. The physician Becqueret wrote to a *Société* member, saying “I do not see anywhere in your letters patent any article which gives you the right to dispose of our possession, our patrimony, our property [...] your pretence is worthless. it is opposed to political right.”<sup>356</sup> The Faculty made sure that the *Société* never overstated its patented rights, but it could not argue against the validity of those rights that were included in the letters.

The *Société* also made a number of claims which were based on morals rather than law, especially related to the sacrifice that was undertaken by the members who decided to join it. The memoir argued for instance that *Société* affiliates were making a sacrifice in their decision to enrol in hard research work which was unlikely to ever bring them fame or substantial rewards. This also justified the hiring of younger rather than more experienced physicians.

it was necessary to have in the société Young People who had the time and the zeal necessary for a long and arduous work, to write the memoirs and consultations under the inspection of Experienced Physicians.<sup>357</sup>

The memoir added that without the all-important dedication of the younger members of the *Société*, the correspondence could never have been maintained, as no senior physicians would ever want to take on such a demanding and thankless chore.

The question of finances became a recurring point of conflict. Accusations of greed were a running motif on both sides of the altercation. The Faculty brought up the annuity that all *Société* members were receiving, accusing them of selling their medical integrity for the immoral benefit of a pension. In return, much like Pierre Chirac had done half a century prior, the *Société* members rarely failed to mention the price of entry into the Faculty, accusing it of admitting people of fortune rather than people of merit.<sup>358</sup> This accusation was

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Remèdes à Brevets, l'inspection et l'analyse des Eaux Minérales, l'entretien d'une correspondance avec les Médecins Regnicoles et Etrangers, le traitement des maladies Epidémiques et la réunion des travaux tant anciens que modernes.”

<sup>356</sup> Correspondence from Becqueret to Manduyst, (1779), Registre 10, BIU. “je ne vois nulle part dans vos lettres patentes aucun article qui vous donne le droit de donner le droit de disposer de notre bien, de notre patrimoine, de notre propriété; rien qui soit contraire a la sagesse qui a présidée a la rédaction de notre declaration du 25e avril 1777. votre prétexte ne vaut rien. il est opposé au droit politique.”

<sup>357</sup> “Observations sur l'établissement d'une Société de Médecine”, (ca. 1776), SRM 114A, dossier 4, ASRM. “On Répondra q'il fallait nécessairement dans la société des Jeunes Gens qui eussent le tems et le zèle propres à un travail long et pénible qui rédigeassent les mémoires et consultations sous l'inspection des Médecins Expérimentés.”

<sup>358</sup> On the price of entry at the Faculty, see: Taton, *Enseignement et diffusion des sciences en France au dix-huitième siècle*, 17. For an example of a *Société* member attacking the high prices

often made in a very light veil of irony, one that granted the authors just enough plausible deniability to avoid a libel charge. For instance, the *Société's* memoir asked the very innocent question of why so little work had been done towards “a reform which would have been equally useful to the faculty and to the public”, stating that surely, it was not because the faculty feared that a reform would lead to a diminution in its revenue: “One cannot suspect the members of the faculty of Paris of such sleazy interest.”<sup>359</sup>

Of note here, the accusations of avarice also tied into other critiques, in particular regarding the state of the teaching at the Faculty. The memoir pointed out the absence of a proper course in chemistry at the Faculty, despite its natural ties with a number of medical subjects. The students had to either teach themselves and each other the science, or attend a separate course in chemistry. The authors of the memoir stated that this gap in knowledge was hardly acceptable given the high entree fee of the faculty. In that sense, the *Société* was presenting itself as the more modern institution, and its embracing of chemistry in the service of medical knowledge was a sign of this progressive thinking.

### *Mounting tensions*

These memoirs and their responses did little to appease tensions. A *Société* Associate declared in 1778:

A war is open and we are on arrest. we shall see who wins. I flatter myself that we shall be neither annihilated nor exterminated despite the threats that have been made.<sup>360</sup>

The use of this martial vocabulary makes it easy to understand why most of the members of either institution picked one side and stuck to it. But as each opponent gathered its troops, some confusion happened as to whose side people were on. A letter written by the Count of Angeville expressed his utter surprise as being thought of as a *Société* opponent. He wrote of the shock he

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of entry at the Faculty, see: “Mémoire ou l'on examine ce que la Faculté de Medecine pourrois faire de plus avantageux pour le public et pour elle dans sa position actuelle”, (ca. 1778), SRM 114B, dossier 1–10, ASRM. “au merite et n'etre qu'au mérite”. “bien des hommes de mérite distingué en seront exclus parcequ'ils manquerons de fortune; et bien des gens médiocres y seront admis parcequ'ils aurons de l'argent.”

<sup>359</sup> “Mémoire ou l'on examine ce que la Faculté de Medecine pourrois faire de plus avantageux pour le public et pour elle dans sa position actuelle”, (ca. 1778), SRM 114B, dossier 1–10, ASRM. “Pourquoy n'a on pas travaillé efficacement à une réforme qui auroit été aussi utile à la faculté qu'au public, et à la quelle on devois être excité par l'exemple des heureux succès de celle de l'Ecole de chirurgie ? Ce n'est pas assurément la crainte de perdre les émolumens ordinaires qui en a empêché. On ne peut pas soupçonner les membres de la faculté de Paris d'un intérêt aussi sordide.”

<sup>360</sup> Correspondence between two *Société* Associates, SRM 114B, dossier 1–10, ASRM. “voilà La guerre ouverte et nous voila en arret. nous verrons qui l'emportera. je me flatte que nous se seront pas anéantis ni exterminés malgré les menaces que l'on fait.”

felt at having been nominated to attend an anti-*Société* meeting. He stated that “disapproving of the letters patent of the société Royale, and its prerogatives” was a dangerous game to engage with, and the Faculty should know better than to openly criticise the creation of an institution that came directly from the king’s orders.<sup>361</sup> He considered himself a very happy member of the *Société*, and shamed his Faculty colleague for ever suspecting otherwise.

This highlights the division between the two institutions, one with a deeply entrenched sense of independence, unafraid to protest state power, the other a well-connected institution, created with the explicit protection of the king and his ministers. The count also alluded to his personal connection with the controller-general, warning his colleague that “[M. Turgot] will also be upset when he hears this.”<sup>362</sup> The *Société* often used its support from ministers as a method of intimidation.

The increased tension eventually led physicians who were members of both the Faculty and the *Société* to become *persona non grata* at the Faculty. This was more than a simple tacit discomfort; people were actively removed from the institution.

Sirs Coquereau, Thouret, Chaussonne and [blank], members of the Société have attended the assembly at the faculty, and [the Faculty] far from becoming wiser by the Letter of Mgs the Keeper of Seals, has treated them with the same impertinence. they have been forced to leave and they have been led out with outcry and cheering.<sup>363</sup>

Those three *Société* Associates who were laughed out of the room when attempting to sit at a Faculty meeting were all *Docteurs-régents*, and one of them had even been a professor there for a time.<sup>364</sup> After this incident, all members of the *Société* were no longer admitted at the meetings of the Faculty, and it forbade its constituents from attending those of the *Société*.<sup>365</sup>

The peak of antagonism came about shortly thereafter and concerned the correspondence. A unique feature of the *Société* was its vast reaching network

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<sup>361</sup> Copy of the correspondence between the Count of Angeville and Bacher, (April 1778), SRM 1114B, dossier 1–10, pièce 6, ASRM. “J’apprens mon cher Docteur, avec une surprise que je ne puis vous dissimuler que j’ai été nommé dans une assemblée de la faculté et ce qui me surprend le plus encore c’est qu’on m’assure que c’est par vous, comme désapprouvant les lettres patentes de la société Royale, et ses prétentions, je vous rends les termes.”

<sup>362</sup> Ibid, “on m’a ajouté que vous aviez cité également M. Turgot. je ne crois pas assurément qu’il différemment de moi, et je crois qu’il sera également fâché lorsqu’il l’apprendra.”

<sup>363</sup> “Observations sur ce qui s’est passé à la faculté jeudi dernier”, (27<sup>th</sup> November 1778), SRM 114B, dossiers 1–10, pièce 8, ASRM. “Mrs Coquereau, Thouret, Chaussonne et [espace vide], membres de la Société ont assisté a l’assemblée de la faculté, et cette dernière loin de devenir plus sage par la Lettre de Mgs le Garde des Scaux, les a traités avec la même impertinence. on les force a sortir et ils ont été conduits avec des huées et des applaudissements.”

<sup>364</sup> Coquereau had been a professor at the Faculty. See: Amédée Dechambre, “Dictionnaire encyclopédique des sciences médicales,” (Paris : G. Masson : P. Asselin, 1877, 1877), 400.

<sup>365</sup> “Observations sur ce qui s’est passé à la faculté jeudi dernier”, (27<sup>th</sup> November 1778), SRM 114B, dossiers 1–10, pièce 8, ASRM.

of physicians in the kingdom and abroad (the “communication of lights”). The Faculty, in a bid to eclipse this advantage, attempted to install a rival system of correspondence. This was deemed to be rather counter-productive. Eventually, the state authorities ordered to have it shut down. The Faculty went on strike as protest against what it deemed to be an unfair suppression. The *Société* then proceeded to use its connections with the court to put an end the strike. Lassone wrote directly to the Keeper of the Seals, Amelot with the support of Necker who stated in a letter to the First physician that the *Société* was being “violently threatened by the faculty” and it “ought to inform M. Amelot of the circumstances in which it finds itself and claim his protection in the maintaining of its laws and its constitution.”<sup>366</sup> It took an entire three months of back and forth but eventually, the Faculty, directly summoned by the Keeper of Seals, had to end the months of strike and resume work.<sup>367</sup> By this point, it became clear that the Faculty had used up the entirety of its arsenal, and that the *Société* was here to stay.

*Bad-faith arguments and rhetorical attacks: a controversy worthy of the eighteenth century*

Disentangling this altercation presents challenges. Both institutions argued in rather bad faith, making the actual substance of the conflict sometimes difficult to access. One example of this can be found in the early attempts at ‘peace’ which were made by the *Société* around the writing of the Letters patent. Some steps were taken to try to get the Faculty onboard with the project. A number of Associates organised an assembly at the Faculty on the topic of the creation of the *Société*, so that the subject could be discussed openly. In their letter to the Dean, the organisers said: “expect from us nothing that is not honest or Respectful”.<sup>368</sup> This gesture was maybe a little offset by a lack of flexibility in the choosing of a potential date, so as to “ease those of us who tend to Many affairs”.<sup>369</sup> The Associates were not trying to be overly accommodating, even in those early days.

Another letter circulating around the same time, invited some members of the Faculty to listen to the reading of the Letters patent officially instating the *Société* as a royal institution. As such an invite was always going to be a touchy subject, the author flattered the Faculty officials by stating that the *Société* could only gain from the Faculty member’s experience. He, perhaps

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<sup>366</sup> Letter draft from Lassone to Amelot and Necker, (ca. 1778), SRM 114B, dossier 1–10, pièce 3, ASRM. “la société de médecine royale violemment menacée par la faculté de médecine a cru devoir informer M. Amelot dans les des circonstances dans lesquelles elle se trouve et réclamer sa protection pour dans le maintien de ses loix et de sa constitution.”

<sup>367</sup> Michel Foucault, *Naissance de la clinique* [The Birth of the Clinic] (London: Tavistock Publications, 1973), 27.

<sup>368</sup> Correspondence from Geoffroy, Lorry, Manduyst, Coquereau to the Dean of the Faculty, (ca. 1776), SRM 114B, dossier 2, pièce 2, ASRM. “n’attendez rien de nous que d’honnête et de Respectueux.”

<sup>369</sup> *Ibid*, “vous obligeriez ceux d’entre nous qui ont Beaucoup d’affaires”.

wisely, crossed out the sentence: “you will have a new occasion to do some Good”, and choose to instead say “the société will have the pleasure to share the tribute which is so legitimately given to you by the faculty”.<sup>370</sup> The fact that the subtle dig against the Faculty was even written shows that the intents of most *Société* Associates were not exactly sincere in their pacifism.

This kind of tone which bounced between arrogance and politeness was commonplace in the correspondence between the two institutions. It is likely that many off-tone pleasantries were only sent as a way to show records that the *Société*'s founders gave the Faculty a chance to keep relationships cordial, and did not antagonise them immediately. Given the much safer position of the *Société*, and the very immediate protest of the Faculty, it is quite possible that there were no actual good-faith attempts at easing tensions.<sup>371</sup>

This sort of deceitful arguments came up again later on in the altercation. Soon after the strike, the Keeper of Seals ordered the Faculty to submit a report listing all of the decrees that it had taken since the instating of the Letters patent.<sup>372</sup> The Dean, upon the second request, complained about having to spend two nights writing this document. The person reporting on this from the *Société* added that the Dean had “made a mention of a decree concerning the faculty’s latrines, in order to Avoid any reproach of negligence or forgetfulness.”<sup>373</sup> He also mentioned that all this work was written on loose paper, which made it difficult to bound it into the official registers. This kind of letter is an example of the constant time-wasting arguments that were exchanged in the midst of the conflict. At times, the *Société* refused to answer critiques levied by the Faculty, stating that they were so ridiculous that “the société R.[oyale] believes it would fail itself by responding.”<sup>374</sup>

A large portion of this conflict happened via letters, in private correspondence or in the format of pamphlets and memoirs, but it also took place to an extent in the public sphere. Vicq d’Azyr had to write to the newspaper *La*

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<sup>370</sup> Minutes de lettres d’invitation aux séances de la SRM, (1778), SRM 114B, d1–10, ASRM. “~~vous aurez une nouvelle occasion de faire le Bien~~ et la société aura le bonheur de partager l’hommage qui vous est rendu si légitimement par la faculté.”

<sup>371</sup> Hannaway’s institutional history corroborates the strength of the position of the *Société*, especially as it was composed of a number of faculty members, which she gives as the explanation as to why it could endure its second controversy with the Faculty. Hannaway, “Medicine, Public Welfare and the State in Eighteenth Century France: The Société Royale de Médecine of Paris (1776–1793).”, 80–227.

<sup>372</sup> “Observations sur ce qui s’est passé à la faculté jeudi dernier”, (27<sup>th</sup> November 1778), SRM 114B, dossier 1–10, pièce 7, ASRM. “La lettre de Mgs Le Garde des Sceaux portais que le Doyen serait tems de lui remettre les decrets portés depuis l’enregistrement des lettres Patentes de la Société et que le Roi suspend juqu’a ce qu’il ait fait connoitre leur Intentions tous les decrets de la faculté portés depuis l’Epoque des Lettres Patentes.”

<sup>373</sup> Ibid, “d’y avoir tout inseré, il a fait mention d’un decret concernant les latrines de la faculté, afin d’Eviter tout reproche de negligence ou d’oubli.”

<sup>374</sup> “Observations, sur un dernier libèlle contre la Société de Médecine”, (ca. 1778), SRM 114B, dossier 1–10, ASRM. “Tous les autres faits allégués ne méritent aucune attention. ils contiennent tant d’erreurs et de faussetés, que la société R. croirait se manquer à elle même en y répondant.”

*Gazette Salulaire* to complain about an article that had been published against the *Société*. The article was, according to him, full of falsehoods, and if the editor had any “love for justice”, he should have it corrected in the following paper.<sup>375</sup>

The most striking text that came out of this entire controversy was not a libellous journal article, bad-faith pamphlet or an angry letter. It was a full-length, three-act play, written entirely in perfect 12-syllable alexandrines, written for the sole purpose of mocking the *Société* and every single one of its Associates. In an ultimate move of protest, a Faculty supporter not only wrote but published this satirical piece, starring all members of the *Société* as the much-ridiculed followers of the First physician. It is unclear whether the play ever made it to the stage, but its existence remains an important, however peculiar, testimony to the strong rivalry between the two institutions. The apprentice playwright was said to have been trying to “Bring back home to the Faculty the Unbelievers who had distanced themselves from it.”<sup>376</sup>

The play tells the story of a few greedy, attention-seeking physicians, who saw an opportunity to gain fame and riches by joining the new *Société*, chaired by Lassone and Vicq d’Azyr. For the minor concession of having to set aside their Hippocratic Oath, they could leave the moral but penniless life at the Faculty for the comfort of a salary and the insurance that their name would be forever remembered. The *Société* in this satire was portrayed much like a secret society, in which all the members used the code name Jean-François and met undercover to conspire against science and the incorruptibility of medicine. The following monologue (Figure 3.1) was pronounced by the character Jean-François Fourcroy, which was an obvious stand-in for the count Antoine François de Fourcroy (1755–1809), who was at the time a young unlicensed physician and chemist, and real-life member of the *Société*.<sup>377</sup>

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<sup>375</sup> Correspondence from the physicians of the Faculty to the *Société*, (1781–1782), SRM 114B, dossiers 1–10, pièce 12, ASRM. “l’amour de la justice”.

<sup>376</sup> Levacher de La Feutrie, “Lassone ou La Séance de la Société Royale de Médecine, Comédie en trois actes et en vers.”, 54. “il ne paroissoit occupé que du soin de ramener au bercail de la Faculté les Infideles qui s’en étoient éloignés”.

<sup>377</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société,” (Paris : de l’imprimerie de Philippe-Denys Pierre, et se trouve chez Didot jeune, 1779).

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Scene III, Fourcroy (alone)

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To attach myself to Vicq, oh! how well I did!

What a man this Vicq! & what intelligence he has!

He is a well of science, a sun of lights:

Yes, Vicq by himself is worth ten entire Faculties.

How he is courted! how every Doctor

Rushes around him, wants him for protector!

How much money this Cabinet has in abundance!

It is, in good faith, of Peru the fertile country.

God! so many Charlatans, to rob the Public,

Come pay in gold the signature of Vicq!

It seems that in these quarters the mineral sources

Carry this metal with their venal waters.

How much do the Magnet & the Electricity give?

The Syrup of Velnos, the Waters of Beauty?

Of Laffecteur the anti-syphilic Remedy?

And of Weisse already the public ordonnance?

That is what we do not do...But what I conceive

Is that our kind Sirs are named Jean-François;

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Scène III, Fourcroy (seul)

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De m'attacher à Vicq, oh ! que bien il me prit !

Quel homme que ce Vicq ! & qu'il a donc d'esprit !

C'est un puits de science, un soleil de lumieres :

Oui, Vicq vaut à lui seul dix Facultés entieres.

Comme on lui fait la cour ! comme chaque Docteur

S'empresse autour de lui, le veut pour protecteur !

Comme en argent comptant ce Cabinet abond !

C'est, ma foi, du Pérou la campagne féconde.

Dieu ! que de Charlatans, pour piller le Public,

Viennent payer en or la signature Vicq !

On droit qu'en ces lieux les sources minérales

Apportent ce métal avec leurs eaux vénales.

Combien donnent l'Aimant & l'Electricité ?

Le Syrop de Velnos, les Eaux de la Beauté ?

De Laffecteur le Rob anti-syphillitique ?

Et de Weisse déjà l'ordonnance publique ?

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That I must remember, so that I can let enter	C'est ce qu'on ne fait pas... Mais ce que je conçois,
Only people whom my Master has smiled upon:	C'est que nos beaux Messieurs se nomment Jean-François;
So is the word of the watch. But...some- one knocked, I believe?	Qu'il faut m'en souvenir, pour ici n'introduire
Let us see...Who knocks here?	Que gens à qui mon Maître aura daigné sourire :
	Tel est le mot du guet. Mais...on frappe, je croi ?
	Voyons...Qui frappe ici ?

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Figure 3.1 Levacher de La Feutrie, “Lassone ou La Séance de la Société Royale de Médecine”, Fourcroy’s monologue, pages 5–6.

This passage followed the introductory monologue by character Jean-François Vicq d’Azyr, who expressed some doubt about his recent betrayal of the Faculty. His conundrum was however ultimately resolved, when he decided that, all things considered, fame was worth more than integrity. Fourcroy was portrayed as a man who did not even appear to feel this minor scruple and was more than happy to see charlatans pay fortunes for the recognition that Vicq d’Azyr could provide them.

The play remained generally tame in most of its commentary. The author was no Voltaire, and perhaps fearing censorship, the playwright mostly attacked the incompetence and greed of the *Société*, rather than the private life, morals or appearance of its members. There were no overtly scandalous attacks, and it was clearly meant not for a general public, but rather for the enjoyment of the Faculty members, who would recognise the characters, and possibly relish in the satirical depiction.<sup>378</sup> The amount of effort on display, the time that it had to take to write fifty-three pages of verse, is perhaps the most perplexing aspect of this document, and certainly anchors the controversy between *Société* and Faculty firmly within the written culture of the Enlightenment.

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<sup>378</sup> One exception to this is a veiled allusion to Lassone using the correspondence of the *Société* to communicate with a potential mistress. There is however much plausible deniability to the claim. See: Levacher de La Feutrie, “Lassone ou La Séance de la Société Royale de Médecine, Comédie en trois actes et en vers.”, 44.

### *Incompatible views on the administration of waters*

In the play, one passage in particular calls attention. The character of Fourcroy excitedly mentioned in the passage cited above that at the *Société*, the mineral waters were a source of immense wealth, stating “It seems that in these quarters the mineral sources / Carry [gold] in their venal waters.” This kind of mention came up more times during the play, as the many Jean-François were thrilled to be in command of the mineral waters and delighted to see how lucrative this enterprise was proving to be. This allusion was not innocent. If nothing else, it is quite the testimony to the size of the mineral water market to see that by 1779, mineral waters had become so profitable that the administration in charge of regulating their commerce could be mocked using the image of a greedy physician sitting on a pile of liquid gold.

I would suggest that the importance of the *Société*'s mission as sole administrator of the mineral waters resided much closer to the heart of the controversy with the Faculty than might appear. Often, the Faculty either accused the *Société* of hoarding this lucrative market, or asked to be given that responsibility as the more competent institution for the job. In response, the *Société* argued that the trade of the mineral waters and its many intricacies was one of the very reasons why a new and distinct institution was needed in the first place. A century of attempts at regulation had failed – in part due to the Faculty's handiwork, or so the *Société* argued – it was therefore time for a more modern solution to take over. If the Faculty could not be swayed towards modernity, it was, by definition, unfit for the administration of a modern trade.

This was expressed concretely in the memoir justifying the creation of the *Société*.<sup>379</sup> In this document, the authors explained that the Faculty was structurally unfit for the control over waters. The fact that the Dean changed every two years went against the kind of regularity that was needed in order to oversee the trade. At the *Société* on the contrary, governance was stable. Another issue was that the Faculty was mostly concerned with the theory of medicine, less with practice. The foundational documents of the *Société* on the other hand often celebrated its practical and empirical view of medicine. The new institution wanted to promote the exchange of knowledge and celebrated the importance of gathering data for its own sake, free of overbearing theory.

all that is nothing but Theory is set aside, the société can not admit anything, if it does not rest on experience, the assured guide in Medicine<sup>380</sup>

A clear advantage of the *Société* was that its funding was stable. This meant that members would always be able to afford the necessary travels required specifically by the commerce of waters. The paid Associates would also be

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<sup>379</sup> “Observations sur l'établissement d'une Société de Médecine”, (ca. 1776), SRM 114A, dossier 4, ASRM.

<sup>380</sup> Ibid, “tout ce qu'il n'est que Théorie en est écarté, la société ne voulant rien admettre, s'il n'est appuyé sur l'expérience guide assuré en Médecine”.

much more willing to undertake these costly and time-consuming travels, since they had fewer external obligations.

In order to counter the accusations of greed that came with this generous funding, the *Société* framed its work as a highly selfless activity. The vocation of anyone in the medical field was to help the public, and a position at the *Société* was so time-consuming that many members would no longer get the opportunity to work with patients. The trips to the mineral springs were given as an example of this selfless dedication to medical research. Visiting a spa and analysing its waters took long. It was stated that such trips took so much time that most members had little opportunity to work towards their own careers, and that they would likely be “forgotten” to posterity, unlike most physicians who could enjoy the rewards of their grateful patients.<sup>381</sup> Since chemical analysis was also expensive, it meant that the Associates had to receive external help in order to pursue it.<sup>382</sup>

The final argument which was leveraged against the Faculty was that it was too hierarchical to effectively work with correspondents. No one could become a member of the Faculty without graduating there. Because of this, the Faculty only knew how to handle relationships with either current students or alumni. Given the vast network of people working with remedies and mineral waters, an authoritative teacher-student relation could put off a large number of potential informants. In contrast, the members at the *Société* boasted a sense of equality amongst themselves.<sup>383</sup> This equality combined with an openness towards new fields was argued to lessen potential arrogance towards correspondents, leading to a more productive environment. Only under these circumstances would a variety of town doctors and local apothecaries feel welcome enough to send their own contributions, no matter how incomplete or dated.<sup>384</sup> The memoir expressed the belief that, through communication without hierarchy, the trade of mineral waters could for the first time be properly administered. It concluded by bitterly stating that, should the Faculty have bothered to be informed on the true intentions of the *Société*, it might not have felt the need to needlessly expel thirty good members from its own ranks.

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<sup>381</sup> Ibid, “peut être oubliés”.

<sup>382</sup> Ibid, “Les frais d'analyse ont été très considérables à certaines Epoques. depuis quelques années le Gouvernement u avait destiné annuellement une somme de 600hh distribuées comme honoraires et comme remboursement aux associés qui, pendant l'année, avaient été chargés de beaucoup d'analyses.”

<sup>383</sup> This statement was conveyed explicitly in the memoir. It is however exaggerated. The *Société* was in fact very hierarchical and held some contempt for the non-physician medical professions, the same contempt which it accused the Faculty of projecting.

<sup>384</sup> This positive statement of equality could of course be a little soured by the stern refusal of the *Société* to accept apothecaries and surgeons in its ranks. But since the Faculty shared this sentiment, it could not use it as a counter.

## The urgent task of securing funding and recruiting Associates

Once the *Société* cut ties with the Faculty, it began work on the tasks of the two *Commissions* that it had replaced. It successfully established a kingdom-wide network of correspondence, operated by Vicq d'Azyr, and used it in order to gather information on the medical state of the provinces. By 1789, Vicq d'Azyr claimed that the network had reached around 800 correspondents.

The meetings in which the Associates discussed and voted on current issues also started to take place on a regular schedule. It is hard to know exactly how diligent the Associates were in attending the meetings, or if their number remained constant throughout the *Société's* existence. But a document from 1792 indicates that twenty-seven out of the thirty possible members were active by that time. It also showed that over the course of the past six months, the *Société* had held forty-nine meetings, which was a little over its biweekly obligation. Attendance to the meetings remained consistent throughout that year, although out of forty-nine occasions, only Coquereau and Vicq d'Azyr attended every single one. Most members attended one meeting a week.<sup>385</sup>

Funding appears to have remained constant. The *Société's* finances came from two fronts. Half of its budget was supplied directly by the state. This government fund was primarily employed towards payroll for the Associates. In 1786, twenty-five Ordinary Associates received direct pensions. Vicq d'Azyr, as the only full-time employee, received 7,400<sup>l</sup> a year as annuity. Five other Associates with important prerogatives received 1,500<sup>l</sup>, while the remainder received smaller pensions of 400<sup>l</sup>. In 1792, the thirty Ordinary Associates all received pensions. Some had even seen their salary increased, as a few members received 500<sup>l</sup> instead of the originally planned 400<sup>l</sup>.<sup>386</sup>

The other half of the *Société's* revenue came from the profit made on the administration of the mineral water market (Figure 3.2). Most of this money came from the fees that bureau tenants had to pay for the exclusive privilege of selling waters in their town. The *Société* was therefore not making money by selling waters directly, but by granting the permits and privileges to do so. According to a 1778 document, the king ordered that the surplus of revenue from the mineral waters be used towards the public meetings, the “experiments” that had to be performed on remedies, the analysis of mineral waters, and the reimbursement of members how had been charged with “extraordinary operations”.<sup>387</sup>

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<sup>385</sup> Charge et revenus, traitement des membres, (1789–1792), SRM 114A–B, dossier 12, ASRM.

<sup>386</sup> Ibid.

<sup>387</sup> “Etat a l'Emploi que le Roi veut être fait chaque année à compter du 1er 8bre 1778 par la société Royale de Médecine du produit des Eaux Minérales”, (1<sup>st</sup> October 1778), SRM 114A, dossier 3, pièce 2, ASRM. “L'intention de sa Majesté est que le surplus du produit des Eaux Minérales sois employé d'abord aux dépenses des séances publiques et ensuite 1<sup>o</sup> aux frais des

*Nouvel Etat de*  
*Distribution des Fonds accordés par le*  
*Roi à la Société Royale de Médecine.*  
*Sur le revenu des Eaux Minérales.*

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1°. Au Premier Médecin du Roi, comme Sur-intendant des Eaux Minérales de France .....	6000 <sup>4)</sup> .....
2°. Pour les Jettons qui sont distribués dans les Séances de la Société Royale de Médecine .....	6000 .....
3°. Pour deux prix chacun de 600 <sup>4)</sup> .....	1200 .....
4°. Pour un Commun .....	1000 .....

Figure 3.2 Attribution of the profit made on the mineral water market. (SRM 114A, dossier 19, pièce 7, ASRM). © Bibliothèque de l'Académie nationale de Médecine (Paris)

expériences qui pourroient être nécessaires pour constater l'efficacité de certains remèdes dont les propriétaires ne seroient pas en état de faire à leurs dépens les 8 expériences 2° aux frais de voyage des commissaires chargés d'aller sur les lieux analyser les Eaux Minérales, et constater leurs propriétés, 3° en gratification aux membre de la société qui auront été chargés d'opérations extraordinaires." An example of an extraordinary operation can be seen in the following: Missions by Hallé, Dehorue Fourcroy, Vicq d'Az, Doubet and Laporte, inspection regarding the spread of epidemics in prisons, Charge et revenus, traitement des membres, (1789–1792), SRM 114A–B, dossier 12, ASRM.

In 1786, this revenue came to 19,600<sup>l</sup> for the year. It was used to fund a salary of 6,000<sup>l</sup> for the First physician, on the basis of his role as superintendent. The rest of the revenue that year was used to fund the pensions of other Associates, the payment of a clerk, the printing of the *Société's* minutes, two prizes, the operating costs of the public meetings, as well as a few undisclosed minor costs.<sup>388</sup>

There is an uncertainty as to whether the *Société* reliably received this entire revenue every single year. Documents from 1790 allude to the fact that some funds were no longer attributed to the *Société* for a short period of time, and that in consequence, the funds from the state had to be increased to match the deficit. Generally speaking, the *Société* kept a steady stream of income, in part and sometimes only via public funding, up until the revolution. It occasionally had to ask for additional funds in order to finance trips or especially expensive activities, but the fact that it was housed essentially for free at the Louvre helped keep its operating costs relatively low.

### *Gradual recruitment of Associates*

There were a number of available slots for each class of Associate, which were filled by elections during the course of several years. When members died or left, the vacant slots were eventually given to new recruits. The internal rules stated that the Ordinary Associates (which were the most important positions to fill since there was a salary attached to them) had to be very carefully chosen. Those recruits had to be physicians known for either “a distinguished practice”, “an esteemed book”, “courses given with success”, or “by one or several memoirs, read and approved in [the *Société's*] meetings”.<sup>389</sup>

Was this ambition realised?<sup>390</sup> The early lists of Associates seem to suggest as much.<sup>391</sup> In 1776, the fledgling *Société* started out with only its founding members, namely Lieutaud (1703–1780), who was First physician at the time, Lassone, the Ordinary physician, and Vicq d'Azyr, as perpetual secretary. The

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<sup>388</sup> “Nouvel Etat de distribution des Fonds accordés par le Roi à la Société Royale de Médecine sur le revenu des Eaux Minérales”, (1786), SRM 114 A–B, dossier 19, pièce 7, ASRM.

<sup>389</sup> “Projet de reglements concernant les assemblées et les travaux de la Sté Roy de medecine”, (ca. 1778), SRM 114A–B, dossier 6, ASRM. “art 32. la Sté ne pourra choisir ses associés ordinaires que parmi les medecins connus par une pratique distinguée, par un ouvrage estimé, par des cours faits avec succès, où par un où plusieurs mémoires lus et aprouvés dans ses séances, notre intention étant que cette compagnie ne s'associe que de personnes estimées par leurs lumieres soit dans la pratique, soit dans la théorie de la medecine.”

<sup>390</sup> I will take the *Histoire de la Société Royale* of 1779 as a source here, since its listings of Associates are very precise, and confirmed by two different manuscript internal documents of the *Société*. “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, 25–33. See the manuscript version in SRM 114 A–B, dossiers 15 and dossier 19, ASRM.

<sup>391</sup> A full prosopography of the *Société* Associates, though it would be incredibly insightful, is not the purpose of the present thesis, and would be an endeavour more suited to a research piece oriented solely on the medical institutions of the late Enlightenment. I will therefore limit the scope here by simply looking at a sample of the Associates, and note the presence of different categories of professions within their ranks.

Faculty Deans were shortly thereafter automatically granted a position. The first ever Vice director was Poissonnier (1720–1798), who was a physician and held a chair at the Academy of Sciences. Following the initial foundation, eleven members were granted positions. They were all physicians, and some held prestigious positions. Lorry (1726–1783) for example was the physician of the Prince of Condé. There was another academician among those early members, in the chemist Macquer (1718–1784). As for the importance of teaching, Antoine Laurent de Jussieu (1748–1836) was granted a spot. His status as a *Docteur-régent*, his academy position as well as his quality teaching of botany were cited as the reasons for giving him the position.

A year later, two new teachers joined the ranks, in the person of Bucquet (1746–1780), who was a professor of chemistry and an academician. That year also saw the successful candidature of another physician of the prince of Condé, Coquereau (1744–1796), who was skilled in both medicine and chemistry. The *Société* kept its promise to hire a few physicians who held their degrees from other faculties than Paris. Namely, the Associates included graduates from Nancy, Montpellier, and Caen.

The Free Associates were mostly recruited a year after the initial creation of the *Société*. As of 1777, eleven more had been added to the ranks. These included a few noteworthy names, like the controller of Finances Necker, the famous patron of the sciences Duc de la Rochefoucauld (1743–1792), or Amelot the secretary of state. The Free Associates also counted many academicians, the likes of Duhamel de Monceau (1700–1782), Daubenton (1716–1800), Watelet (1718–1786), and Trudaine de Montigny (1733–1777).

The early Regnicole Associates who were a class of unpaid Associates living outside of Paris were mostly men of medicine who lived in a variety of French towns. They were sometimes simply doctors in medicine, but many also held a secondary position, such as a professorship, a position as a mineral water intendant, or a chair in an Academy. In Strasbourg for example, there were two Regnicole Associates. The first was Ehrmann, who was the Dean of the local Faculty of medicine, the second was Spielmann (1722–1783), who was a public teacher in chemistry, botany and medicine.

1777 was also the year during which many of the foreign Associates were formally invited. They were typically important physicians in other countries. There was for example Wintringham (1720–1794), who was the First physician in England, Abraham Bäck who was a court physician in Sweden, or Camper who was a professor in anatomy and surgery in Groningen. A few other noteworthy names stood out, such as the inclusion of Benjamin Franklin (1706–1790), who resided in Passy at the time, and the inclusion of the English chemist Joseph Priestley (1733–1804).<sup>392</sup>

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<sup>392</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, 25.

More names were added as the years went by, especially after the Letters patent of 1778 which gave the *Société* more legitimacy. Two noteworthy additions in 1779 and 1780 were those of Fourcroy and Cornette (1744–1794), who were both academicians, and both skilled in chemistry.<sup>393</sup> 1780 also saw the addition of de la Guerenne, who was the inspector of the market of mineral waters for the Paris region. New positions of Free Associates were also granted later. As of 1782, two new academicians joined the ranks, one of them being the ‘father of chemistry’, Lavoisier (1743–1794).<sup>394</sup>

Overall, these names reflected a certain amount of prestige. Some Associates were just *Docteurs-régents*, but those were likely hired based on their publications. Moreover, the choice of Associates reflected the good relationship between the *Société* and its two main allies, the Academy of Sciences of Paris and the government. Members of both were found among the Associates. The members also reflected an intention of gathering a certain elite within the medical world in one place, with the notable inclusion of experts in sciences that could be of great help to medicine, such as physics, botany, surgery, and most importantly, chemistry.

## Layers of laws

While the scientific mission of the Associates was pressing, they also held the equally critical charge of fixing the many problems that plagued the market of remedies in the kingdom. The *Société’s* authority was largely based on the law stating the First physician’s superintendency over mineral waters. This law was “clear”, “important”, and could not be easily “eluded”, hence why it served as the foundation on which it hoped to build further regulation.<sup>395</sup> This mission was inherited from the prerogatives of the *Commission*, which had started to work on the issue and already implemented some rules regarding the matter. The *Société* therefore had access to those drafts, when working on its own regulation. At the same time, the *Société’s* own rules and structure had to be formalised, in order to connect the regulation of the market to the authority

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<sup>393</sup> “Tableau des Membres qui composent la Société Royale de Médecine”, (1786), SRM 114 A–B, dossier 19, pièce 4, ASRM.

<sup>394</sup> ‘Father of chemistry’ has been an epithet given to Lavoisier, alluding to his role in instigating the New Chemistry. This appellation is mostly found in older secondary literature or historiography from the sciences. See for example: C. N. R. Rao and Indumati Rao, “‘Antoine Laurent Lavoisier (1743–1794) — Father of Chemistry’,” in *Lives and Times of Great Pioneers in Chemistry*, (*Lavoisier to Sanger*) (Default Book Series, 2016). At the time of his nomination at the *Société*, Lavoisier was an active chemist, but he had not yet conducted the campaign of the New Chemistry that would make him famous. His work on the Nomenclature or his treatise of chemistry were published a few years after his nomination. Tableau des Membres qui composent la Société Royale de Médecine, (1786), SRM 114 A–B, dossier 19, pièce 4, ASRM.

<sup>395</sup> “Observations à la commission au sujet des eaux d’Enghien”, (5<sup>th</sup> May 1777), SRM 113 dossier 1, ASRM. “sur une disposition aussy claire et aussy importante il nest point permis de chercher l’esprit d’une loy, autrement on parviendrait a les éluder toutes”.

of specific members of the institution. These missions were taken together, and the *Société* made many attempts at writing a suitable text of law.

The writing of legislation generated several drafts and essays, many of which have been kept in the archives of the *Société*. The following section will therefore make use of eight different versions of the legislation, that spanned across the decades of first the *Commission*, then the *Société*. Some of these documents are drafts, others are final printed forms of legal documents. They do not provide a full access to the discussions and disagreements which came up in the process of formulating regulation, as all written versions likely already show some amount of consensus. Still, those documents and the changes they show over the years are a fascinating insight into the minds of the amateur legislators of the *Société* as they were reacting to the problems they saw in the market of remedies and mineral waters. Even though most of these laws turned out to be followed loosely at best, their contents reveal the regulators' ambition. These texts also demonstrate a highly centralised perception of order emanating from a young scientific institution and show an attention to detail typical of late eighteenth-century conceptualisations of ruling.

Legislation in the *Ancien Régime* was akin to a process of sedimentation. To put it simply, there were often two dynamics at play. The first was that any Letter patent, decree or edict from the king remained valid until overruled. This meant that a number of laws had very old dates of proclamation. This kind of seniority could be an advantage, by granting the weight of precedence to a particular law. Additionally, if a law was associated with an especially beloved ruler, that could often play in its favour and memorability. On the flip side, minor edicts could often be buried into irrelevance and only surface when a well-informed lawyer brought them up again. This made a good knowledge of legal history an asset in any legal battle. Alternatively, some legislations could also be purposefully ignored, if not enforced vigorously.

The second dynamic of medieval and early modern French law was the propensity towards repeating old decrees time and again, when they were not effective the first time. These repetitions could be made for as long as necessary.<sup>396</sup> When the same regulation had to be rewritten many times however, it was often a sign of its failure to be obeyed. As those laws were written many times over in edicts or new Letters patent, the penalties for violating the regulation were sometimes increased.

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<sup>396</sup> These dynamics are not restricted to the *Ancien Régime*, but they were prevalent in multiple areas of the early modern law. See: Stéphanie Blot-Maccagnan, *Procédure criminelle et défense de l'accusé à la fin de l'Ancien Régime : Etude de la pratique angevine* (Rennes: Presses Universitaires Rennes, 2010).; Philippe Sueur, *Histoire du droit public français XVe–XVIIIe siècle, Affirmation et crise de l'Etat sous l'Ancien Régime, La genèse de l'Etat contemporain*, vol. 2 (Presses Universitaires de France, 2007).; Anne-Sophie Condette-Marcant, *Bâtir une généralité, le droit des travaux publics dans la généralité d'Amiens au XVIIIe siècle* (IGPDE, 2001).; André Dubuc, "Législation des foires et marchés en Normandie sous l'Ancien Régime," *Annales de Normandie* 26, no. 4 (1976).

The case for the regulation of mineral waters showed both dynamics at play. The authority invested in the role of superintendent of the mineral waters was aggrandised by the positive association with King Henri IV. The *Société* was however a much better example of the latter dynamic of rewriting inefficient legislation over and over in the hopes of getting it to work through repetition. Many attempts were made throughout the early modern times to regulate mineral waters, and if one thing remained constant, it was the complaints of its ineffectiveness.

Another aspect of the process of law making, first at the *Commission* then at the *Société*, which is made abundantly clear from the archival record, is the care and attention that was poured into it. The drafts I have selected here for analysis do not constitute all available material on the preparation of regulation, and the number of different handwritings, erasures, rewrites on a single document, all testify to drafts that were circulated between different Associates.<sup>397</sup> The heads of the institute were heavily involved, as was the First physician. It is also apparent that these drafts were discussed in the weekly meetings, and thus represented the result of collective debate. Most of these documents started with an introduction, which usually served to justify the need for regulation in the first place. These defensive paragraphs were followed by articles which made up the main text of the proposed law.

#### *The legitimising Letters patent of 1778*

The early days of the *Société* were mostly consumed by planning and legislation. As soon as it became clear that the *Société* was going to survive its altercation with the Faculty, the members started to devote a lot of attention to the crucial task of elaborating the Letters patent which would confirm them in their academic structure. As mentioned above, there were two rounds of Letters patent, one in 1778, the other in 1780.

The 1778 letters started with a long prologue, describing the situation which had led the king to support the formation of a *Société de Médecine*. The tone was relatively positive, unlike previous texts of this kind. Instead of decrying the prevalence of charlatanism and fraud, the introduction emphasised the good work done by its predecessors and celebrated the medical institutions of the time. The role of the *Commission* was mentioned for instance. The introduction then outlined the three main duties of the *Société*, namely the study of epidemics, the administration of mineral waters and the establishment of a correspondence.

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<sup>397</sup> A few specific files are dedicated to the compiling of legislation from the *Commission* and the *Société*, but they do not cover all relevant documents. Other legislative drafts are scattered under different themes. Nevertheless, a number of the documents used in the following passage come from the file: *Création et organisation de la SRM : projets de lettres patentes et de règlements, listes des membres et des correspondants, création de comités, état des pensions, (1776–1790), SRM 114 A–B, dossiers 5, 6, 7, 8 and 9, ASRM.*

This relatively lengthy introduction was followed by fourteen articles which laid down the rough foundations for the structure of the *Société*. It defined the number of Associates, the heads of each class and the importance of the election process. In the last articles, additional were defined, and the prerogatives of the *Commissions* were once again mentioned and transferred to the *Société*. The document concluded with a full list of the current Associates and foreign correspondents.

Generally speaking, the 1778 Letters patent presented a bare bones version of the academic structure of the *Société* and addressed the urgent issue of legitimacy. It was rare for such a young institution to receive Letters patent so quickly. Interestingly, the Faculty of Medicine came up often in the letters. The introduction opened by calling the Faculty “Our dear & much beloved eldest daughter the University of Paris”, praising “the enlightenment [*lumières*] that its teachings have not ceased to spread on all the Sciences”.<sup>398</sup> This opener was perhaps not the most sensitive choice, as the introduction then went on to state that despite these efforts, complementary Academic institutions were still needed. But the rest of the introduction, and even the articles, worked hard to keep a semblance of peace. The next page mentioned not wanting to “hurt the rights & the prerogatives of our Universities”, because creating adjacent establishments composed mostly of their alumni could only “add to the glory & the splendour of these Bodies destined [...] for public instruction”.<sup>399</sup> This respect for the Faculty was also reflected in the articles. First, according to Article III, twenty out of the thirty Ordinary Associates of the *Société* had to be *Docteurs-régents*. Additionally, the Dean and the oldest member of the Faculty were both given special privileges to attend the meetings with the same voting rights as other Associates. Two commissioners were also mandated each year in order to ensure a “communication of lights” with the Faculty. Finally, the last article made it clear that the Associates were not to question the Faculty’s privileges, and would only be allowed to practice medicine if they graduated with a regular doctorate.<sup>400</sup> This particular point was deemed critical in not upsetting the Faculty. It can be found in the earlier drafts of the Letters, among only four articles listed.<sup>401</sup>

The Letters patent also insisted on the importance of communication, and on the idea of scientific exchange. The first paragraphs praised the value of

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<sup>398</sup> “Lettres patentes du Roi, portant établissement d’une Société Royale de Médecine: données à Versailles au mois d’Août 1778” 3. “Notre chère & bien aimée fille aînée l’Université de Paris, & à son exemple les autres Universités de notre royaume aient procuré dans tous les temps à nos sujets, par les lumières que leur enseignement n’a cessé de répandre sur toutes les Sciences”.

<sup>399</sup> *Ibid.*, 4. “Loin que la formation de ces Compagnies particulières ait pu blesser les droits & les prerogatives de nos Universités ou de quelques-unes des Facultés qui les composent, Nous avons au contraire toujours considéré leur établissement comme ajoutant à la gloire & à la splendeur de ces Corps destinés de toute ancienneté à l’instruction publique”.

<sup>400</sup> *Ibid.*, articles II, VII, VIII and XIV.

<sup>401</sup> “Projet de la déclaration qu’on propose d’envoyer aux différentes cours souveraines du royaume”, Article IV, (1779), SRM 114A–B, dossier 5, ASRM.

sharing science between reputable men of knowledge, in addition to the insights from “foreign countries, where the Sciences & the Fine Arts are not cultivated with any less success.”<sup>402</sup> This optimistic stance on the importance of knowledge circulation was carried throughout the introduction, and into the articles.

### *The structural Letters patent of 1780*

The second set of Letters patent, composed two years later, differed from the first in both form and intent. A draft of the letters was kept in the records, giving insight into the process of their writing. The draft was likely not the first of its kind, given the kind of precision displayed. It was written by Lassone, the First physician. Compared to the 1778 letters, this text showed a clear shift of focus from legitimising the mission of the *Société* to defining its structure. It contained few mentions of progress, or of the higher purpose of Enlightening the art of medicine. Rather, it took much trouble to carefully lay out the chain of command from the king to the *Société*, and from the *Société* to the various actors that it had power over, while delineating each intermediary role. It also answered concrete questions regarding the daily activities of the *Société*. Who should be the one to announce important decisions? How late could the Associates show up at the meeting before they were noted as absent? Who would be put in charge of keeping the peace during the meetings? The answers to these practical points made up the bulk of the articles.

Unlike the 1778 letters, the tone was dry, and at times borderline irritated. A note stated that all discussions should be calm, and “without heat”, no doubt alluding to past confrontational arguments between members.<sup>403</sup> A few passages showed optimism, like article 20, which expressed a wish to keep a regular correspondence with the heads of faculties in the entire kingdom (not just the Parisian Faculty), as well as with all colleges of medicine. Perhaps after the failure of diplomacy with the Parisian Faculty, the *Société* turned to universities outside of the capital which were much more favourable to its mission than its antagonistic neighbour. On that note, all traces of softness towards the Paris Faculty had vanished from the second letters.

Article 21 was particularly noteworthy. It stated that the *Société* would be granted a twenty year-long privilege for the publication of its memoirs and other material at a publisher of its choosing. For context, it is important to note that this privilege had not been granted to the institution yet, it was stated in the draft as a hopeful wish rather than as a realised ambition. And it was certainly a tall ask for a two-year-old institution, but such a privilege would

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<sup>402</sup> “Lettres patentes du Roi, portant établissement d'une Société Royale de Médecine: données à Versailles au mois d'Août 1778.”, 4. “qui pourroient être recueillies dans les pays étrangers, où les Sciences & les Beaux-arts ne sont pas cultivés avec moins de succès”.

<sup>403</sup> “Projet d'un nouveau règlement relatif au Régime de la société R de Médecine Rédigé par M De Lassone et qui doit être placé a la suite des lettres patentes”, (ca. 1778), SRM 114 A–B, dossier 7, pièce 21, ASRM. Article 11, “avec ménagement et sans chaleur”.

certainly have been inline its academic mission. This article was the only one in the draft with an explanatory note, saying that it had been written the form of “all the privileges granted to academicians and to academic societies”.<sup>404</sup> By writing this, Lassone likely wanted to make it clear that he was not formally requesting the publishing privilege in this document, nor did he assume it would automatically be granted.

The majority of articles in this draft were found in the letters of 1780, with only minor alterations, added precision and a few additions. The publication privilege for example was added as Article 13, and the writing of the *Société's* memoir was formally defined. The tone of the official Letters was softened in places, moving away from Lassone's sometimes passively accusatory prose. Article 8 concerned the reading of the eulogies of deceased members. In Lassone's draft, it stated that the *Société* would read the eulogy of deceased members “if the société, [...], finds them worthy of this Kind of homage which shall not be accorded indistinctly to all members that compose it.”<sup>405</sup> This was likely thought to sound harsh, as it implied that some dead members might be not worth remembering. After a revision process, the final article said instead “[the secretary] will read the eulogies of dead Associates which the Société believes ought to be heard in public”.<sup>406</sup>

One point of contrast was the alternation between articles championing equality, and those establishing hierarchy. The process of election was stressed in the articles. The majority of positions within the *Société* were elected ones. The suffrage was to be blind, and to involve all different types of Associates.<sup>407</sup> The holder of the elected position would often only hold it for a year or two before being replaced by a new candidate. The same article also forbade candidates from “visiting” their fellow Associates, meaning they were not allowed to campaign for a position. They were only allowed to submit their candidature and wait for the votes. This spoke to a desire of erasing differences in social statuses among members. But despite claims of an egalitarian society of minds, the *Société* also had a strong inner hierarchy.

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<sup>404</sup> Ibid, “21 Le Roi voulant faciliter la publication des travaux de la société lui accorde pour 20 ans à compter de ce jour le privilège de faire imprimer, par tel imprimeur qu'elle voudra choisir, la collection annuelle de ses mémoires, les ouvrages de ses associés et Généralement tout ce qu'elle croira devoir publier, après toutesfois qu'elle aura fait examiner par des commissaires les d ouvrages et juger qu'ils sont dignes de l'impression lequel privilège sera renouvelé au bout de ce terme. (1) (1 Telle est la forme de tous les privilèges accordés aux académiciens et aux sociétés académiques).”

<sup>405</sup> Ibid, “Article XVII. Il annoncera le décès des associés et des correspondans que la société aura eû le malheur de perdre; il fera quelques remarques historiques sur leur vie et sur leurs ouvrages ou il lira leur Eloge, si la société Réunie et consultée à ce sujet les trouve dignes de cette Espèce d'hommage qui ne sera point accordé indistinctement à tous les membres qui la composent.”

<sup>406</sup> “Lettres Patentes du Roi, portant Règlement pour la Société Royale de Médecine, donnée à Versailles le 1er Février 1780, registrées en Parlement le 25 Avril audit an,” (A Paris de l'imprimerie Royale, 1780), 8. “il lira les éloges des Associés morts que la Société aura cru devoir être entendus en public”.

<sup>407</sup> Ibid, 2. Article III.

## Structure and Hierarchy of the *Société de Médecine*

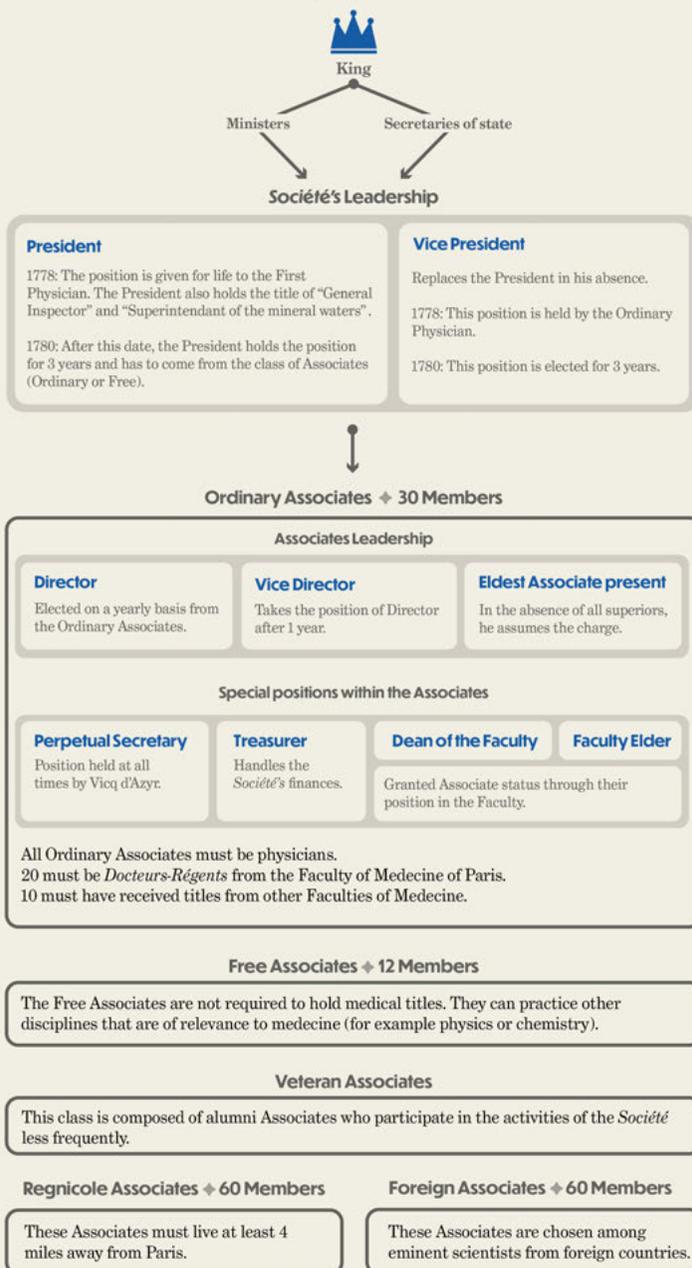


Figure 3.3 Structure and Hierarchy of the *Société*. By author.

Figure 3.3 shows how the line of command worked, as described from the two sets of Letters patent. At the top of hierarchy was the king. It was after all called the *Société Royale* de médecine. The king was to transmit his will to the *Société* through his ministers as well as state secretaries of relevant departments. At the top of the hierarchy within the *Société* was the President. As of 1778, the President was to be the First physician, holding the position for life. After 1780, the President had to be elected and renewed every three years. The President also held the titles of “General Inspector” and “Superintendent of the Waters”.<sup>408</sup> Under the President was a Vice-president who had to replace the president in his absence.

Then came the class of Associates. All together, they were divided in five subcategories. The Ordinary and Free Associates were the ones who lived and worked in Paris and could reasonably be expected to attend the meetings regularly. These two classes were headed by a Director and a Vice-Director. They were to be reelected every year, and the Vice-Director automatically became Director the following year. Both Director and Vice-director could, in their absence, be substituted by the oldest member of the Associates present.

The Ordinary Associates were composed of twenty *Docteurs-régnents*, meaning they held their medical doctorates from the Paris Faculty, and ten doctors in medicine who held titles from other Faculties. Four special positions were to be selected from those Associates: a secretary (Vicq d’Azyr, nominated for life, and who remained the only ever secretary of the *Société*), a treasurer (Antoine de Jussieu), and both the Dean of the Faculty and the *Ancient*, or Elder of the Faculty, who were given equal privileges to the other Associates. The category of Free Associates was smaller and composed of twelve men who were not required to be physicians and could instead practice a different science that could be beneficial to medicine. They had voting rights like the Ordinary Associates, but only in matters of science and administration.

Under the ordinary and Free Associates was the more elusive category of Veterans Associates. This class was made for the benefit of past Associates that could no longer give their full time to the activities of the *Société*. They were still members but had to waive their voting rights and their salaries.

Finally, some of the correspondents were also given Associate status. Again, there were two different versions of this status. First were the Regnicole Associates. They were capped at sixty, and all had to reside at least four miles away from Paris. They would lose their title if they moved to the capital for longer than a year. They were however allowed to attend the meetings of the *Société* if they were in town for a short stay. The last category was made of the Foreign Associates. There were also sixty of them and they were chosen among foreign scientists that could bring knowledge and prestige to the *Société*.

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<sup>408</sup> Ibid, 3. “Inspecteur général” and “Surintendant des Eaux”.

This line of command is not particularly simplistic. It was certainly a large administrative step up from the *Commission* for the study of remedies and mineral waters, which was composed of a mere six members. But over-engineering administrative structures was not particularly out of line for the *Ancien Régime*. This tendency towards endless subdivisions was reflected in the structure of the *Société*, but also in the way it dealt with issues. By 1780, the majority of the *Société*'s responsibilities had been attributed to special committees. A new set of commissioners or delegates was created anytime that a new problem arose. In 1778, it was stated that elections had to be held to determine the members of a committee for the examination of remedies (Art. XI), a committee responsible for analysis (Art. XII.) and a committee for insuring communication with the Faculty (Art. VIII). The 1780 letters stipulated the addition of a committee for the reading of foreign memoirs (Art. V), a committee to travel to locations that necessitated attention (Art. V), special assemblies for urgent affairs, including three permanent ones (Art. XII), a committee to prepare the particular assemblies dedicated to the writing of prizes (Art. XV), a group of special commissioners to work on urgent matters while the *Société* was on holiday (Art. XVI), and a committee for the organisation of travelling (Art. XX).

This tendency towards over-preparedness was not just the sign of an institution in the making, and in the search for its role and identity. This constant division in committees and subcommittees, and constant delegation, was carried on throughout the entire existence of the *Société*. In a sense, this subdivision was also used a way to give more members responsibilities. Simply attending the meetings was sometimes too little to satisfy the ambition of some of the Associates.

Admittedly, the *Société* was a short-lived institution, and evolutions are therefore difficult to describe. In the final years of its existence however, the Associates made a new attempt at writing their internal legislation. This document only exists in draft form, but this preliminary version was signed by nineteen members. This new version differed so little from the Letters patent that one might wonder why it was ever written. This 1790s text's only purpose seems to be the formalisation of yet more detail, as it had a total of fifty articles, compared to the twenty-six of the Letters patent. But despite this, their content was very similar. There was an increase in the tendency noted earlier, of defining the chain of command in a way so precise that it could not be faulted. Articles were added for example to clarify the exact prerogatives of the secretary, or the vice-director. But much of this was already present to an extent in the previous versions. The only genuinely new addition was a suggestion that members should start building a collection of natural history specimens. Other than these minor adjustments, hierarchy remained stable during the *Société*'s years of activity.

## Planning for every contingency

The *Société* represents an interesting case study in the longer history of rules in the eighteenth century. Lorraine Daston describes the late absolutist French regime as a moment of tightening around the idea of the rule. According to her analysis, the governments of the late eighteenth century repeatedly attempted to construct the perfect legislation that could at last fix the many ills of society.<sup>409</sup> One of her case studies focuses on Paris and the many attempts at bringing order, safety and cleanliness to the streets through repeated regulation and complex policing systems. I believe that the same type of uphill battle is at play here. The *Société*, upon seeing that previous rulings failed to be universally applied, tried to address the issues of prior regulation. But it did so in the spirit of the time, and that spirit was one of precision. Its scientific staff probably helping, the Associates demonstrably believed that if every single possibility could be accounted for, if every eventuality was addressed in writing, then perhaps legislation would finally be effective.

This line of thought was encouraged by the experience of the *Commission*. The Associates knew that every time a state institution had tried to impose a new ruling, it bumped against a previous law, a quirk in government or a stubborn town parliament that found workarounds.<sup>410</sup> Even in cases where the authority of the superintendency prevailed, the First physician was constantly wasting time arguing against half-legitimate legal arguments. But if the *Société* managed to come up with rules that circumvented protests before they could be raised, then its efforts would succeed. This was, at least, the hope.

Precision was everywhere in the drafts of legislation. The *Commission's* rules already showed signs of this tendency. The most egregious example was the article discussing the retributions, or tips, of spa town workers. If a *baigneur* or *baigneuse* earned a retribution, they were not allowed to simply pocket it. The amount had to be split into three equal parts. One part, the worker could keep for themselves immediately. The rest was pooled with all other retributions of the day, which were then divided equally among everyone, including the people that earned them in the first place. If they tried to hide it however, they would have to give up on the entire amount of the retribution as well as miss out on their share of the collective pool of tips. The second time that this happened, they would be fined 10<sup>l</sup>, and the fine would also be split among the other workers at the spring.<sup>411</sup>

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<sup>409</sup> Daston has developed this perspective in a series of talks in the last years: Lorraine Daston, "Historicizing the Self-Evident: An Interview with Lorraine Daston," interview by Jack Gross, 2020.; Lorraine Daston, "Dreams of a Rule without Exceptions: A Chapter from the History of Rules" (Seminar of the Swedish Collegium for Advanced Study, 2019).

<sup>410</sup> See chapter 5.

<sup>411</sup> Raulin, "Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangères", (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. "Article 13. [...] il sera expressement déffendu à tous officiers et domestiques de demander au dela du prix fixé. ne prétendons néanmoins leur interdire de recevoir les gratifications que les

This kind of system for the management of gratuities could reach this level of complexity over time, but typically, it would be at the discretion of each town intendant to decide on the best ways of splitting tips among workers. But in this case, this was decided centrally, in Paris, by a *Commission* which was not leaving much to chance.

The majority of the over-planning was to be found in the *Société's* Letters patent and its drafts. The conduct of the internal elections for example was very precisely outlined, considering that most ballots only concerned about thirty or forty voters. There was much care given to the unlikely situation of undecided votes (as in, equal votes both in favour or against a motion). In those cases, it was stated in the Letters patent who should be given the decider vote, and who was to be the substitute of the person who held the deciding vote, if they happened to be absent on the day of a hung jury.<sup>412</sup> More menial details of this kind were also taken care of. An entire article was written to specify who was to keep the keys to the cabinet which held the records of the meetings.<sup>413</sup>

Care and precision within a text of law does not have to be an especially notable manifestation by itself. Laws are, in essence, supposed to predict their own bypassing. But in the eighteenth century, this tendency was increased with intent. The Letters patent and their drafts contained an article which ordered the reading of the rules once every year, at “the last meeting after Easter”.<sup>414</sup> The rules had to be frequently read, to always be at the forefront of

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gratifications que les malades de leurs donneroient. Volontairement, mais voulons que dans le cas il seroit prouvé qu'il auroient exigé et reçu en conséquence plus qu'il ne leur seroit dû, ils soient contraints à resituer aux malades, ou a leur refus au profit des pauvres du lieu, ou de la ville voisine. Les gratifications seont partagées en trois parts, un tiers appartiendra a celui qui l'aura reçue ayant fais le service, les deux autres tiers seront mus en masse pour être partagés entre tous, sans en exclure celui qui auroit reçu légitimement, ceux qui retiendroient la gratification par devers? eux seroient contraint de la rapporter toute entiere à la masse, et n'auroient pas droit au partage pour la premiere fois, et en cas de récidive ils seroient en outre condamnés a 10++ d'amande au profit des camarades.”

<sup>412</sup> “Projet d’un nouveau règlement relatif au Régime de la société R de Médecine Rédigé par M De Lassone et qui doit être placé a la suite des lettres patentes”, (ca. 1778), SRM 114 A–B, dossier 7, pièce 21, ASRM. “9 Lorsqu’une place d’associé ordinaire ou libre sera déclarée vacante par décès ou autrement, le President indiquera l’élection a huitaine. Elle se fera au scrutin à la pluralité des voix. dans le cas d’égalité d’entre deux concurrens on fera un scrutin pour eux seuls et si l’égalité persiste encore la voix du President et en son absence celle du directeur sera prépondérante. on observera les mêmes formalités dans les Elections du president et du secretaire, avec cette différence que les noms de ces derniers seront présentés au Roi pour obtenir son agrément.”

<sup>413</sup> Ibid, “6 Le secretaire perpetuel sera depositaire de tous les Registres, papier et livres de la société dont chaque année il sera fait un inventaire par le President et le Directeur sortant d’exercice. Les titres principaux de la société seront conservés dans une des salles et en un lieu sur dont le President, le Directeur et le secretaire auront chacun une clef.”

<sup>414</sup> “Lettres Patentes du Roi, portant Règlement pour la Société Royale de Médecine, donnée à Versailles le 1er Février 1780, registrées en Parlement le 25 Avril audit an.”, 11. “Article XXVI. Afin que tous les articles de ce règlement soient plus présents à la mémoire des Membres de la Société, il en sera fait lecture chaque année dans la dernière séance après Pâques;”.

everyone's attention. This was followed by the penultimate article, which stated that in case the Associates saw fit, they should add to the already existing list of articles and write new Letters patent. In that sense, those texts were always open, always ready to include yet more subdivisions, yet another layer on the already tall pile of *Ancien Régime* legislation. If this process was kept up for long enough, the Associates hoped that perhaps one day, order might finally be achieved. As Lassone put it in his draft of the Letters patent, "almost all cases would be planned for".<sup>415</sup>

## A new set of rules for the mineral water market

Once the structure of the *Société* was established, the second legislative task was to establish new regulations regarding the trade of remedies and mineral waters. In this area, the *Commission* and the *Société* acted in very similar ways. The creation of the *Société* did technically void the *Commission's* previous rules, but the form and intent of said regulation was very similar from one institution to the next.

The reason stated by both for writing up new legislation was, as ever, fraud. This was far from being limited to these institutions. Most Letters patent related to mineral waters from the eighteenth century made allusions to the prevalence of fraudulent activity.<sup>416</sup> The minutes of the *Commission* had stated many times that most spa towns were "in the greatest disorder", and subject to an administration that was "irregular, fraudulent, and in certain places pernicious to the suffering mankind".<sup>417</sup> Virtually everyone in the wide network involved with mineral waters, from the bureau tenants to the First physician, regularly complained about the misdeeds of others. Transporters were often the target of complaints, but so were the many charlatans who were said to inhabit the springs. The physician Massie, who worked at the spring of Pouillon, stated that he hoped to see the "lights" of the *Société* scare away the

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<sup>415</sup> "Projet d'un nouveau règlement relatif au Régime de la société R de Médecine Rédigé par M De Lassone et qui doit être placé à la suite des lettres patentes", (ca. 1778), SRM 114 A–B, dossier 7, pièce 21, ASRM. "Ainsi les différentes parties du Règlement Réunies, ne formeraient qu'un tout, dont les numéros se suivraient, et das lequel presque tous les cas seroient prévus."

<sup>416</sup> This comment was made for example in every iteration of the Letters patent which unified the superintendency with the position of the First physician. Two examples among others are: Médecine surintendance générale des Eaux minérales et médicinales du royaume, (24<sup>th</sup> December 1715), O/1/59, fol. 216 v°, AN.; Sénac (sr) : lettres patentes confirmant pour..., 1er médecin du roi, les privilèges de la surintendance des Eaux minérales et médicinales du royaume, (12th August 1752), O/1/96, fol. 165, AN.

<sup>417</sup> Report on the waters in the Pyrenees, 100e assemblée, (5<sup>th</sup> January 1778), SRM 113, dossier 10, ASRM. "sa majesté se determina d'après la deliberation [...] a m'envoyer dans les pirennées, pour faire l'inspection des principaux etablissements des eaux Mineralles, que vous avies reconnu, etre, dans le plus grand desordre, et les eaux dans une administration, irreguliere, frauduleuze, et en certain endroits pernicieuse à l'humanité souffrante".

“dreadful charlatanism”.<sup>418</sup> In a letter to the *Commission*, the physician Merle once suggested that legitimate staff at the springs should wear uniforms so as to be easily distinguished from charlatans.<sup>419</sup> Merle even added, probably sarcastically, that wearing a uniform would be a lot more convenient than walking around with an official permit stitched to his back, as it had apparently come to this at the waters of Barbotan where he worked.<sup>420</sup> In another case, a bureau tenant caused unrest for several years, and repeatedly claimed that the local inspector was conspiring against him with the help of a greedy physician. His accusations required the *Commission* to do a rather lengthy investigation into the matter of the allegedly fraudulent inspector, one that did not completely exonerate him, as it turned out.<sup>421</sup> Fraud, it seems, could be found anywhere, even among those who were supposed to quash it.

The first draft of interest here dated from the days of the *Commission*, and specifically concerned the regulation of mineral waters and their usage. It appears that much of this document was the work of Joseph Raulin, due to his close collaboration with the *Commission* and his personal knowledge of the springs.<sup>422</sup> The draft was written and presented to the members of the *Commission* in 1777.<sup>423</sup>

The draft started by listing everything that was wrong with the current state of the mineral water market. According to Raulin, the service of mineral waters was “seldom exact”, “irregular”, “unfaithful”, riddled with “charlatanism”, “lack of exactitude”, “frauds”, with all that being a “great prejudice to the public”.<sup>424</sup> Following this exceptionally pessimistic paragraph, Raulin

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<sup>418</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM. “mon zele s'etendra non seulement sur ce qui regarde les eaux minérales, mais encore sur l'execution des mesures qu'elle doit prendre, pour proscrire du royaume, l'affreux charlatanisme : c'est un grand travail sans doute, qu'elle a entrepris, mais je ne la crois pas au dessus de ses lumières et de son credit”.

<sup>419</sup> Correspondence from Merle to the *Commission*, 86e assemblée, (20<sup>th</sup> January 1777), SRM 112, dossier 14, ASRM.

<sup>420</sup> Ibid, “Comment nous distinguer d'une foule des gens sans aveu qui couvent les eaux minérales en trompant impunément le public. Quel moïen plus sûr que celui d'être révéu d'un habit qui en nous distinguant, nous faisoit respecter dans l'occasion ou nôtre autorité est nécessaire ce qui arrive journellement ? Nos voeux sont ceux du public. Faut-il qu'un Medecin ait toujours son brevet en main ou écrit sur son dos pour l'annoncer ? Le sejour aux eaux n'étant que momentané, le malade arrivant a besoin de connoitre dans l'instant celui à qui il doit s'adresser.”

<sup>421</sup> Minutes of the *Commission*, on the disentangling of the conflict between Tardy and Arnaud in Le Puy en Velay, 92e assemblée, (2<sup>nd</sup> June 1777), SRM 111B, dossier 2, ASRM.

<sup>422</sup> Raulin, “Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris.”; Raulin, “Traité analytique des eaux minérales en général, de leurs propriétés et de leur usage dans les maladies.”

<sup>423</sup> Raulin's draft was explicitly written in response to the alleged inefficiency of the declaration of April 25<sup>th</sup> 1772, and the *Arrêt du conseil* of April 1<sup>st</sup> 1774, which had both failed to adequately regulate the administration of mineral waters.

<sup>424</sup> Raulin, “Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangeres”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. “Le Roy Etans informé des désordres qui se commettent aux différentes fontaines minérales du

presented his solution, wrapped in twenty-six articles that he hoped would finally overcome these various ills.

The first article had the clear purpose of restricting access to the springs. It defined the season of the waters (from the 1<sup>st</sup> of May to the beginning of October) as well as stated that the bathing establishments should only be visited under the supervision of the local medical staff, who had to take care of closing the facilities at night and off-season.<sup>425</sup>

The majority of the articles were structural. They redefined the hierarchy of people working with the springs – the inspectors, intendants, sellers, distributors – and spelled out their specific obligations, and their privileges. The worker's salaries and other compensations were planned in the proposed legislation. The intendant's roles and obligations featured by far most often in this text. They were to keep clean records of the visitors at the springs, hire suitable personnel, oversee activities, arrange payroll and see to the following of the rules. In exchange, they received salary as well as free housing at the spring.<sup>426</sup> The articles also extended the prerogatives of the intendants, giving them the rights to address issues in other parts of the town. If for example, the patients complained about their lodging or their food, they could report these "abuses" to the intendant who was then summoned to fix the issue.<sup>427</sup> The articles defined the prerogatives of each position and gave a number of pointers as to what kind of person should be hired to fill them, in a bid to create more reliable service by improving the qualifications of the staff.

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Royaumem du dépérissement de la plupart de ces fontaines, du service peu exact, irrégulier, peu fidele et malentendu qui sy fait par les medecins chirurgiens et appoticaires établis auprès des Eaux, et par les domestiques qu'on y attache au service des malades; du charlatanisme qui s'y exerce; du peu d'exactitude qui regne dans certains bureaux établis par la commission royale en différentes villes du royaume, des fraudes qui se commettent dans le commerce et la distribution des Eaux minérales autans de france qu'Etrangeres, malgré la disposition de la déclaration du 25 avril 1772 et l'arrêt du conseil du 1er avril 1774 et au grand préjudice du public;”

<sup>425</sup> Ibid, “art 1er. Les médecins Intendants, les inspecteurs Les chirurgiens des Eaux minérales établis, ou a établi par la commission royale de médecine se rendront aux fontaines dans les saisons des Eaux qui ne commenceront qu'au 1er mai, es finirons au commencement de 9bre. il sera fais déffenses de faire usage deseaux a leur source avant et après ces Epoques, a moins qu'elles ne soient Expressément ordonnée par des Gens de l'art; dans ce cas les fontaines ne seront ouvertes que par la permission des médecins intendans qui en garderons les clefs. Lorsquils demeureront dans le lieu ou est les sources, ou que les confierons a telle personne qu'ils jugerons a propos, pourvu qu'elle soit Employée au service des eaux, les intendans et inspecteurs auront soin de faire fermer les fontaines bains et douches, tous les soirs aussitôt que le services des Eaux sera fini, et de veiller à ce que tous sois nêtoyé et remis en ordre pour le Lendemain.”

<sup>426</sup> They were also exempt from a number of *corvées*, the obligatory tasks that subjects had to perform, such as hosting soldiers or working on the roads. See: Ibid, “art 24eme. Voulons que les médecins Intendants les inspecteurs fontainiers ou distributeurs des Eaux, ainsi que les directeurs des bureaux Etablis soient exempts de logement des gens de guerre, de corvées [...] et autre charges publiques afin que rien ne les trouble dans les fonctions qui leurs seront assignées par la commission Royale.”

<sup>427</sup> Ibid, “Art 3eme. [...] surtout en ce qui regarde le service des malades qui prendrons les eaux si même ils reçoivent de la part des malades quelques plaintes relatives au logement, et a la nourriture, ils emploierons leurs bons offices pour arrêter ces abus”.

Some articles were a transparent reflection of Raulin's own experience when visiting spa towns.<sup>428</sup> He included articles regarding cleanliness, suggesting that the baths, showers and steam baths should be cleaned every day during the water season. He also included an article on the spread of contagion, pressing the staff to replace the water and cleanse all environments after the passage of a contagious patient.<sup>429</sup> Much of his proposed regulation appears to have been for the purpose of avoiding any kind of uproar [*tumulte*], by setting strict opening hours, and strict lines of command. He suggested that in case of trouble, the police should get involved.<sup>430</sup>

Finally, several articles touched on the logistics of transported waters. The first point of importance was the price. Raulin admitted that the circumstances that could lead to slight variations in prices were "infinite", and he therefore ordered that the price should be decided in discussion between the intendant physicians, local magistrates, and the *Commission*. They were ordered to convene so as to make sure that the public would never be "overcharged".<sup>431</sup> The other regulations were meant to avoid "frauds and infidelities".<sup>432</sup> They included an order to have the waters carried in glass vessels, using local units of volume. As mentioned earlier, glass was believed to be a neutral material which kept the waters more stable and did not interact with its contents. It was also a transparent material, one that made other 'fraudulent' practices like under-filling the bottles more difficult. The bottles also had to be always accompanied by certificates which mentioned the date of filling. In addition, since

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<sup>428</sup> See for example his visit to the town of Verdusan where he praised the good administration: Raulin, "Traité des eaux minérales de Verdusan, connues sous le nom d'eaux minérales de Castera Vivent, avec leur analyse, leurs propriétés & leur usage dans les maladies, fait par ordre du gouvernement.", 5–6. On the other hand, he witnessed a lot of issues in different spa towns, which were likely the inspiration for his ruling. See: Minutes of the *Commission*, address by Raulin, 105e assemblée, (4<sup>th</sup> May 1778), SRM 113, dossier 15, ASRM.

<sup>429</sup> Raulin, "Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangères", (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. Article 9, "on ne baignera personne dans la même Eau, que le bassin n'ais été vidé balayé et remplis de nouvelle Eau de source. on nettoiera aussi les lieux et instrumens destinés pour les douches et Etuves afin que personne n'y entre avant que l'on ait pris des précautions."

<sup>430</sup> Ibid, "art 10eme. Les Medecins intendans indiqueront à chaque malade les heures des bains, des douches des Etuves et boüe par des billets, afin que le trop grand nombre qui se presenterons en même tems néxcite ny embarras ni tumulte, et pour maintenir l'ordre et faire observer la police nécessaire, l'intendans et la province établira auprès de chaque source au moins deux cavaliers de marechaussée qui feront observer l'ordre établi".

<sup>431</sup> Ibid, "art 16eme. Comme le prix des Eaux minérales et des bains douches, étuves Xa doit être différens suivant la nature des Eaux, suivant le plus ou moins de facilité à les fournir et a administrer aux malades, suivant le taux des denrées et des autres choses nécessaires à la vie suivant les circonstances qui varient à l'infini, selon la difference des lieux, les medécins intendans auront soin d'après l'avis des magistrats et des six notables du lieu au moins d'en fixer le prix, et d'en informer la commission royale qui prendra sur ces objet, et sur ceux qui pourrons y être relatifs les mesures convenables pour assurer un reglement de maniere a ce que le public ne sois poins surchargé."

<sup>432</sup> Ibid, "Art. 19eme Eviter les fraudes et les infidelités qui pourroient se commettre dans le puisage et l'envoi des Eaux, les medecins Intendans, et en leur absence les autres officiers veilleront à ce que les vües de Sa Majeste soient exactement remplies".

“the heat of the day notoriously participates in the Evaporation of Mineral Waters, especially the sulphurous and acidulous” waters, the hours at which the waters could be drawn were restricted to three hours after sunrise. In addition, and “for the good of the public”, winter transportation had to be avoided altogether.<sup>433</sup> This was also presumably done because of the order to use solely glass vessels, which shattered easily in the frost.

The most important purpose of this proposition was to make sure that the failure of previous attempts at regulation was not repeated. In order to do so, Raulin’s proposal included precisions regarding the people who should enforce the rules. Instead of simply stating that the bottles should be filled in the mornings for example, the text placed the responsibility directly on the intendants to make sure that this practice was kept. Putting them in charge, rather than simply writing about the necessity of doing so *in abstracto* would allow the *Commission* to place blame on someone in case of non-conformism. Several fail safes were built into the regulation. Raulin, aware of the lack of resources of some smaller springs, made sure that the absence of the intendant would not signify the end of all order. As the position of intendant was a central figure in his new plan for administration, he provided options for replacements, as well as plans for a remuneration that would serve as incentive for them to do their job to the best of their abilities.<sup>434</sup>

In general, this proposal placed less focus on punishing malpractice (although some threats of jail were made for those who sold waters illegally).<sup>435</sup> The promise of harsh retributions had been tried in the past to little avail. Instead, Raulin tried to place a lot of power and responsibilities on the shoulders of the intendants, in the hope that a localised strong presence of authority would alleviate the issues he had witnessed in his travels.

Most of these regulations were taken up by the *Société*, after it took over from the *Commission*. First, it was clear that the positions of intendants, inspectors and bureau tenants, all continued to exist under the *Société’s* rule. The fixing of prices was watched very closely, and the institution enquired

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<sup>433</sup> Ibid, “art 21eme. Il sera ordonné qu’attendu que la chaleur du jour concourt notoirement à l’Evaporation des Eaux Minérales, surtout les sulfureuses et les acidules a qu’elles n’ont jamais la même force trois heure après le lever du soleil qu’elles avoient auparavant. ces Eaux seont exactement puisées au moins une heure avant, et pour le plus tard une heure après le lever du soleil. on ne fera, autant qu’il sera possible le transport des Eaux dans les bureaux établis ou a établir par la commission royale, que depuis le commencement du mois d’avril jusqu’au per de 9bre. Les pluys de l’hyver pouvant altérer leur vertu, d’ailleurs elles seroient exposées à se gélér en route pendant la mauvaise saison, accidens quil est essentiel d’éviter pour le bien public.”

<sup>434</sup> Eighteen out of the twenty-six articles concerned the intendants, with formulation along the lines of “the physician Intendant will see to...”. Raulin, “Copie d’un projet d’arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu’étrangères”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM.

<sup>435</sup> Ibid, “art 25eme. Il sera déffendu sous peine de Nullité du brevet et même demprisonnement à toutes sortes de personnes de vendre ou distribuer dans les lieux ou l’on s’assemble pour l’usage des Eaux ou dans les environs aucune espece de remede à moins qu’elles n’en ayant obtenu la permission du médecin Intendant”.

about price lists, both in the towns and in the bureaux.<sup>436</sup> The *Société* also took decisions to make sure that the bureaux were functional and profitable. They denied a permit to a bureau in the Vivarais for example, stating that the bureau in the neighbouring town of Le Puy en Velay would make for unproductive competition.<sup>437</sup>

Several allusions to the use of seals on the bottles were also made. The seals had to be switched when the change of institution took place, but essentially, they fulfilled the same role. Every bottle which held the seal of the *Société* was guaranteed to have been drawn at a suitable hour, and in a time frame which would not allow the water to go bad prematurely.<sup>438</sup>

### *Moralising through legislation*

Complaining about fraud and offering to adjust the situation through centralised legislation was not out of place in *Ancien Régime* France. But to the typical anti-fraud Enlightenment rhetoric that was used to justify the need for regulation and retribution, both the *Commission* and the *Société* added a noticeable moral colour to their promises of better policing. The members of both institutions often expressed in their writings, their letters to each other, and in a number of memoirs, that the commerce of remedies and mineral waters was chaotic because it lacked strong and moral principles of conduct. This immoral and interested attitude was the reason for the tarnished reputation of the spas. The texts of laws contained a number of articles that were trying to address such problems.<sup>439</sup>

This dynamic could be seen in the 1777 *Commission* regulations. Article 7 stipulated that all workers should be chosen according to both their intelligence and their reputation. Once hired, if a worker was ever accused of “serious” deeds, article 8 stated that they should immediately be removed from service while the investigation took place, to avoid harming the spa’s respectability any further.<sup>440</sup> An obvious point of morality addressed in the legislation

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<sup>436</sup> See for example a response sent about the waters sold in Lyon: Questions and answers about the bureau of Lyon, (ca. 1773), SRM 90A, dossier 2, pièces 1–5, ASRM. This document is also discussed in Chapter 2.

<sup>437</sup> “Mémoire pour Sr François ange Gleyzolle négociant de la ville dupuy de tournon en vivarais”, (undated, between 1778 and 1790), SRM 93A, dossier 7, ASRM.

<sup>438</sup> See an example of the use of a seal for the waters of Sainte Reine: Analysis of the waters of Sainte Reine by Fourcroy, (1781), SRM 92B, dossier 46, ASRM.

<sup>439</sup> See: Cossic and Galliou, *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*.

<sup>440</sup> Raulin, “Copie d'un projet d'arrêt du Conseil portant reglement concernant les Eaux minérales, tant de France, qu'étrangères”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. “Art 8eme. Lorsque les medécins intendans auront quelque sujet et plaintes graves contre quelques uns des officiers ou domestiques attachés au service des Eaux minérales ils leur interdrons le service de leurs fonctions et en nommeront d'autres qui exercerons à leur place pour interim, jusqu'a ce que. la commission informée des reproches faits et fondés ait prononcé sur la validité et la destitution du délinquant, et de la nomination du nouveau sujet proposé afin que ce nouveau sujes légalement reçu jouisse des privileges et des droits à lui accordé.”

concerned the separation of men and women at the spring. Much of the libertine reputation of spring towns came from the knowledge that individual of different sexes could bathe in the same places, and at the same time. The articles of conduct were quite clear on the matter:

The Physicians intendants will see that there is at each spring servants of one and the other sex so that the men be served by men, and the women by women; they will take care also that the men and the women be separated in the baths, the places where the showers are being given, the Steam rooms, so that they are not exposed to the view of one another.<sup>441</sup>

For similar reasons, patients were prohibited from walking around in simple shirts, which was the only clothing most people were used to wearing during cures. Claims of indecency however, convinced a number of the towns to demand people dressed decently for all activities outside of bathing.<sup>442</sup>

Application letters for the positions of inspectors confirmed that these moral questions were in fact shared by others in the network. Some applicants voiced their ambition to close down the cabarets for example, and to forbid visitors from engaging in games and gambling.<sup>443</sup> This sometimes caused issues, including with the medical professionals who worked at the springs. A cure at the spa could only work properly if the patient managed to let go of excessive passions as they were called, which meant that distractions and leisure were encouraged.<sup>444</sup>

In order to find a moral middle ground, the literary genre called *Amusements des Eaux*, or Distractions of the Waters gained popularity. These booklets were written for different springs. They contained a variety of humorous anecdotes, stories about the waters and their effects, and sometimes mind games or riddles to keep the reader entertained.<sup>445</sup> Such light reading was considered perfectly acceptable in the context of a cure, and much better than gambling, dancing, or worst of all, quarrelling with others. But the spa towns were also places where illegal literature circulated, ranging from banned political pamphlets to erotic stories.<sup>446</sup> Censorship was difficult to exert, given

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<sup>441</sup> Ibid, “Les Medecins intendans auront soin qu'il y ait a chaque source des domestiques de l'un et de l'autre sexe afin que les hommes soient servis par des hommes, et les femmes par des femmes; ils auront soin en outre que les hommes et les femmes soient séparés dans les bains, les lieux ou lon donne les douches, les Etuves de maniere qu'ils ne soient point exposés à la vüe les uns des autres.”

<sup>442</sup> “Règlement proposé pour les eaux minérales de Bourbon-L'Archambault”, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM.

<sup>443</sup> Provisions du concierge et fontainier de Forges, 21e assemblée, (26<sup>th</sup> March 1773), SRM 111A, dossier 17, ASRM.

<sup>444</sup> This is explored in detail for the city of Bath: Cossic, *Bath au XVIIIe siècle : les fastes d'une cité palladienne*.

<sup>445</sup> Elisabeth Belmas, “Les « Amusements des Eaux » dans la littérature thermale du xviiiè siècle,” in *Le thermalisme: Approches historiques et archéologiques d'un phénomène culturel et médical* (Paris: CNRS Éditions, 2015).

<sup>446</sup> Darnton, *The forbidden best-sellers of pre-revolutionary France*, 25.

the number of travellers and the constantly changing population of the towns, which made the regulator's moralistic missions difficult to bring to fruition.

Another crucial aspect of the quest to moralise spa towns was to maintain the custom of giving the waters for free to the poor. Spas were historically deeply attached to their mission as charitable health sanctuaries.<sup>447</sup> In 1741 for instance, the king ordered that a special administrative corps be created in Plombières, so that the funds allocated to the hospital could be used with "wisdom and economy".<sup>448</sup>

Technically, giving out waters for free was not very difficult for the spring owners to arrange. Once a person was in town, giving them the waters cost virtually nothing. Handing out apothecary-made remedies for free would be a much more expensive operation, but the sources flowed all day and all night. As seen in chapter two and in introduction, some towns had dedicated infrastructure to house the poor, such as hospitals. But even when there were no such facilities, many people who lived in poverty travelled of their own accord to the springs, in the hopes of making a recovery. Sometimes, what was at stake was their very ability to work again.<sup>449</sup> An example of this can be seen in Françoise Froelhy's account of the life of impoverished people in the French south-west in the decades before the revolution. She describes the arrest of Jean Capmartin, who was suspected of vagrancy and of escaping the poor house of Bayonne. He was arrested while he was headed to the waters of Bagnères-de-Bigorre (about 230 kilometres away from his point of arrest) in

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<sup>447</sup> Anne Borsay, *Medicine and Charity in Georgian Bath: A Social History of the General Infirmary, c.1739–1830* (Routledge, 2019).; Patricia J. Erfurt, "An assessment of the role of natural hot and mineral springs in health, wellness and recreational tourism" (Ph.D Thesis James Cook University, 2011).; Daniel Roche, "Le temps de l'eau rare du Moyen Age à l'époque moderne," *Annales. Economies, sociétés, civilisations* 39, no. 2 (1984).

<sup>448</sup> Minutes et répertoires du notaire Thomas Simon Perret, février 1724–22 janvier 1753 (étude XCV). Plombières (eaux minérales), dépôt de pièces procuration fondation pour les malades indigents. extrait des registres des arrêts du Conseil d'Etat du Roy, (23<sup>rd</sup> August 1741), MC/ET/XCV/157, AN. "Le Roy étant informé qu'il a été fondé un hospital dans le lieu de Plombières pour y entretenir des pauvres malades, mais que la modicité des revenus dont il se trouve doté, et le deffaut d'administration ne permettant pas d'y en admettre un aussi grand nombre que les batimens qui y sont construits pourroient en contenir ; en sorte que ses sujets a qui le remede des Eaux minerales de toute espece, dont ce lieu abonde, seroit salutaire, ne tirent pas de cet établissement tout le secours que les fondateurs avoient eü en vüe de leur procurer et que les personnes pieuses qui desieroiert en augmenter le fonds pour le soulagement d'un plus grand nombre de malades, ou infirmes, sont retenües par la crainte de voir les biens qu'ils consaceroient à cet objet de charité dissipés, ou non employés selon leurs intentions ;". Création d'un corps administratif qui peut agir avec "sagesse et oeconomie".

<sup>449</sup> On the treatment of poverty in *Ancien Régime* France: Robert M. Schwartz, *Policing the Poor in Eighteenth-Century France* (UNC Press Books, 2017).; Anne Bérouton, *Peuple et pauvres des villes dans la France moderne, de la Renaissance à la Révolution* (Paris: Armand Colin, 2014).; Isabelle Coquillard, "Les docteurs régents de la Faculté de médecine de Paris et la fourniture de soins aux « bons pauvres malades » dans les paroisses parisiennes (1644–1791)," *Revue Historique des Armées* 668, no. 4 (2013).; Farge, *Vivre dans la rue à Paris au XVIIIe siècle*.; Christian Romon, "Le monde des pauvres à Paris au XVIIIe siècle," *Annales. Histoire, Sciences Sociales* 37, no. 4 (1982).

order to be cured from a stubborn injury which compromised his ability to work.<sup>450</sup>

A large portion of the medical literature on waters included passages in reference to the issue of poverty and access to the waters. In a book exploring the possibility of making artificial mineral waters, the author, Claude François Duchanoy (1742–1827) lamented: “their usage is often forbidden to the man with a limited fortune, & always for sure to the indigent.”<sup>451</sup> The correspondence to the *Commission* often mentioned the waters being inaccessible to people “hindered in their fortune”.<sup>452</sup> A letter mentioned that four hundred people in the author’s region would be in need of the waters, but they were currently reserved for the wealthiest of locals.<sup>453</sup> This was described as “an abominable robbery”, to which the solution was to make sure that “the commerce of Waters be forbidden to any other than the bureau tenant.”<sup>454</sup>

The second article of the 1777 plan for regulation stated unambiguously that the intendants should give their care “gratis” to the poor and should also give the other treatments “such as baths and showers to soldiers, and to those whose poverty will be attested by the priest or the judge of their home.”<sup>455</sup> Article 13 also ordered that, should a worker be caught demanding tips from the visitors, and should they not want to take their money back, the totality of the gratification should be given “for the profit of the poor of the locality, or of the neighbouring town.”<sup>456</sup>

The *Société* followed this example, preaching against profiteers and greed, as well as blatant offences to morality at the springs. The kind of morality displayed had religious undertones. For one, only people of demonstrable catholic faith were allowed at the *Société* or any official position within the market of waters. Any application to a position of inspector or intendant had

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<sup>450</sup> Françoise Froelhy, *Quand la pauvreté était un crime, Les gueux dans le Sud-Ouest au siècle des Lumières (1763–1789)* (Cairn Édition, 2018), 45.

<sup>451</sup> Claude François Duchanoy, “Essais sur l’art d’imiter les eaux minérales, ou De la connaissance des eaux minérales, et de la manière de se les procurer en les composant soi-même dans tous les tems et dans tous les lieux,” (A Paris, Chez Méquignon l’aîné, Libraire, rue des vis-à-vis S. Côte, 1780), 374. “De là vient que l’usage en est interdit souvent à l’homme d’une fortune bornée, & toujours à coup sûr à l’indigent.”

<sup>452</sup> “Règlement proposé pour les eaux minérales de Bourbon-L’Archambault”, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. “personnes gênées de la fortune”.

<sup>453</sup> Mémoire pour le Sieur David, 3e assemblée, (5<sup>th</sup> October 1772), SRM 111A, dossier 2, ASRM.

<sup>454</sup> Letter of recommendation for an apothecary of the Rouergue, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM. “c’est un brigandage abominable, auquel je me flatte de remédier moyennant que le commerce des Eaux soit interdit à tout autre qu’au buraliste.”

<sup>455</sup> Raulin, “Copie d’un projet d’arrêt du Conseil portant règlement concernant les Eaux minérales, tant de France, qu’étrangères”, (ca. 1777), SRM 114, dossier 11, pièce 2, ASRM. “art 2eme Les Intendants des Eaux donnerons leurs soins gratis et feront distribuer aussi gratis les autres secours tels que les bains douches aux soldats, et a ceux dont la pauvreté sera attestée par le curé ou le juge de leur domicile.”

<sup>456</sup> *Ibid*, “Volontairement, mais voulons que dans le cas il seroit prouvé qu’il auroient exigé et reçu en conséquence plus qu’il ne leur seroit dû, ils soient contraints à resituer aux malades, ou a leur refus au profit des pauvres du lieu, ou de la ville voisine.”

to contain some proof of belonging to the “catholic Religion, Apostolic & Roman”.<sup>457</sup> The priest in the Dijon parish ensured that an applicant had always behaved as an “honest man and a good christian”.<sup>458</sup> In Brioude, the parish priest ensured that the applicant had always given “the marks of his good religion”.<sup>459</sup> These endorsements by religious authorities were helpful in the obtention of a permit or privilege. The good morality of the applicants could also be certified by secular testimonies. It was for instance said of a physician applying to become intendant that all upstanding people in the town believed in his ability to administer “those interesting objects [the mineral waters]”, based on his prior good deeds.<sup>460</sup>

Once the manners and religion of workers had been established, the applicants had to follow the strictly imposed pricing. Prices in general had to be kept low, in order to ban profiteering from the trade. Mineral water selling was not supposed to create fortunes, it was to help the sick, which justified why the prices had to be lowered as much as they could suffer without bankrupting everyone involved (or dig too deeply into the *Société*'s revenue).<sup>461</sup> As discussed in the previous chapter, this stress put on the lowering of prices had tangible effect on the market of waters. A few years after the creation of the *Société*, all of the French waters sold in Paris had either remained constant or lowered in price. The cost of waters was easier to correct, and perhaps a more popular decision too, rather than the banning of gambling and mixed baths.

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<sup>457</sup> An example can be seen in the permit of Laville Duvernet. See: “Privilege exclusif pour la vente des eaux minérales, à Marseille, en faveur du Sr. Laville Duvernet”, 22<sup>e</sup> assemblée, (15<sup>th</sup> April 1773), SRM 111A, dossier 18, ASRM. “Religion catholique, Apostolique & Romaine”.

<sup>458</sup> Letter of recommendation from the priest of the parish of Dijon, 26<sup>e</sup> assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM. “il s’est comporté en honnête homme et en bon chrétien”.

<sup>459</sup> Letter of recommendation from the priest of the parish of Brioude, 29<sup>e</sup> assemblée, (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM. “S’est toujours comporté en honnête homme et nous a toujours donné les marques de sa bonne religion”, “Signé prêtre de la paroisse de saint Jean de la ville de Brioude”.

<sup>460</sup> Letter of recommendation by Dubousque and Boniol de Roquefeuil in Theronville for Amilhon, (4<sup>th</sup> June 1775), SRM 111B, dossier 31, ASRM. “tout ce qu’il y a ici de gens comme il faut [...] desireroient de le voir diriger lui même ces objets interessants”.

<sup>461</sup> Because the *Société* was also partially financed by the revenue on the waters, it argued that it had a duty to use this revenu for the relief of a maximum of people. Attribution à la SRM des fonds de gestion des eaux minérales et état de l’emploi de ces fonds, (1778–1779), SRM 114A, dossier 3, pièce 2, ASRM. “La Société de Médecine est infiniment reconnaissante du nouveau bienfait qu’elle vient de recevoir du gouvernement qui a bien voulu lui attribuer une partie des fonds produits par la distribution des Eaux min. elle veillera avec la plus grande attention à ce que cette partie d’administration se fasse de la manière la plus utile et la plus profitable au public. en conséquence elle fera tous les efforts pour diminuer autant qu’il sera possible le prix de ces eaux”.

## Conclusion

In this chapter, I propose a revaluation of the institutional history of the *Société de Médecine*. While this institution has been the subject of some studies, it has rarely been explored in depth, and its role in administering the market of mineral waters and remedies has been undeservedly neglected. A rather practical point made in this chapter is that the actions of the *Société* should not be fully separated from those of its predecessors, the First physician and the *Commissions*. This is not least true when considering the work of the *Société* regarding remedies and mineral waters. The *Société* Associates acted in awareness of past attempts at regulation, and followed in their tracks while trying to avoid the pitfalls outlined by their experience.

The tumultuous story of the *Société's* foundation adds to the picture of late eighteenth-century scientific institutions. While the Paris Faculty of Medicine is often portrayed in the literature as a conservative institution, the 1778-9 conflict gives a concrete idea of its *modus operandi* and brings to light a controversy which has been famously outlined by Foucault in *The Birth of the Clinic*, which to my knowledge has since never been described in full detail.<sup>462</sup> For the purposes of this study, this conflict also provides helpful context in understanding the later actions of the *Société*. For example, by closely associating with the emergent science of chemistry, the *Société* branded itself as the more progressive institution, which can be interpreted as further demarcation from the Faculty.

The *Société* spent much of its early days crafting a line of command both within its own walls and one that extended onto the market throughout the kingdom. In these efforts, the *Société* revealed its own approach to power and regulation. The structure championed by the Associates was relatively egalitarian in questions of science. For example, all Associates, regardless of education or official status could weigh in on scientific matters. But executive decisions were much more pyramidal in their enforcement. The Associates argued for equality, and for a moral conduct in the market of waters, but the *Société* also championed monopolies, strict privileges and the prevalence of physicians over other medical branches. It did not question the advantages of yielding a strong centralised power. The *Société* was a royal institution, operating with government support, which was structurally unable to consider the market under any other angle than a top-down one. This gave the Associates a complex dual identity, acting both as physicians and as government agents.

The closer look at legislation also offers a perspective on the question of fraud which differs from the one presented in the first chapter. In the world of bureau tenants, fraud was often limited to a late payment, a few bottles sold on the side, or an illegal seller in a town disrespecting a privilege. For the *Société* however, fraud was an existential issue, which was both its white

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<sup>462</sup> Foucault, *Naissance de la clinique*, 27–28.

whale and its *raison d'être*. Every piece of legislation was justified on the basis of fraudulent activity, and its creation was constantly made legitimate to the government as a necessary step against the propagation of the much-maligned charlatanism. This emphasis on the prevalence of fraud was also tied to the pyramidal structure of power at the *Société*. If fraud was so pernicious and difficult to catch, it gave reason for the increased sanctions and the attention put into laying out the law.

Finally, these regulations show the attitude of the *Société* towards the market and medicine. Though it was a medical institution, it became clear that when it came to distributing mineral waters, the regulation could not be solely the responsibility of the kingdom's physicians. Instead, the laws were all focused upstream, on transport and administration. The *Société* wanted to ensure that the product which arrived in the hands of patients had been handled correctly, and it did so by focusing its efforts on the supply chain, rather than, for example, giving recommendations directly to consumers on how to best source their waters. Therefore, the actions of the *Commission* and the *Société* can be described in this instance as those of regulators, rather than *savants*. That is not to say that these institutions had no scientific ambitions; those will be studied in the following chapter.

## Chapter 4. Establishing chemical expertise in mineral water appraisal

The previous chapters established a timeline for the advent of government control over mineral waters, culminating with the 1778 Letters patent of the *Société de Médecine*. A decisive tool which the *Société* used to fulfil its regulatory and scientific ambitions was chemical analysis. Being able to appraise mineral waters and obtain reliable knowledge of their composition presented the regulators with a solid base on which to ground their legislative efforts.

Chemical analysis was not invented at the *Société*. An early scientific work of note on the mineralisation of waters came from Bernard Palissy's 1580 treatise on waters and fountains, in which he discussed the origin of the heat and mineralisation of ground waters.<sup>463</sup> By the late seventeenth century, despite the practice of chemistry being viewed with lingering suspicion, analysis had become an accepted method of investigating mineral waters. Between 1670 and 1779, different versions of a plan to analyse all French waters were put into place, with varying levels of success. There was a strong continuity to these successive endeavours. All of them argued for the importance of chemistry in providing data on mineral waters, and all of them claimed that they would result in some aspirational 'big picture' of the French springs. These efforts were motivated by a variety of interests, from economic incentives to public health. The government wanted to know what kind of remedies were being consumed. Despite some failures, the plans of analysing all French waters were attempted again and again, because these ambitions outlived individual wishes, by being part of the wider missions of governments and institutions.

The *Société*, resting on the ground of an already established tradition, decided to include chemistry in all scientific matters regarding mineral waters. But the *Société* also differed from its predecessors. Where all previous attempts at large-scale analysis programs had presented limitations, the *Société's* was the most successful to date. This, I argue, was the result of making a large space for chemistry in its daily activities. This gave the chemical field a lot more respectability, particularly among the key demographic of

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<sup>463</sup> Palissy's work was republished in 1777, at the height of interest in scientific works on mineral waters. Bernard Palissy, "Oeuvres de Bernard Palissy," ed. Barthelemy Faujas de Saint-Fond, Nicholas Gobet, and Nicolás Ruault (Chez Ruault, à Paris, 1777), 239. "Des Eaux et des Fontaines".

physicians. The correspondents were encouraged to perform chemical analyses, leading to a greater number of them being completed. The relative success of this chemical survey greatly contributed to the establishment of chemistry as an expert science in the field of mineral waters, an expertise which outlived the *Société*.

In this chapter, I will first outline the reasons why chemistry was in a difficult position in the early eighteenth century, due to stricter laws in the wake of the Affair of Poisons. I will then recount the history of government-mandated analysis campaigns, highlighting the connections between chemical analysis and regulatory institutions. The chapter will follow a longer chronology, starting in the early eighteenth century, and then moving to the notable attempt at analysing the waters of France performed by the chemist Venel. I will then focus on the decades of the *Commission* and depict the ways in which the *Société* attempted to improve on these efforts, gathering hitherto unseen amounts of knowledge on French mineral waters. In order to do this, I will examine the structural aspects of the presence of chemistry within the *Commission* and later the *Société*. One important mean through which both institutions imposed a chemical standard was by rendering judgments on the quality of the chemical analyses they received. I will therefore highlight the contents of these documents and show the evolution of the *Société's* work with chemistry for the twenty odd years of its existence. I will conclude by detailing the demonstrable persistence of the importance of chemical analysis, even after the French revolution which signed the end of the *Société*.

## The precarious position of chemistry in the early eighteenth century

In the early eighteenth century, chemistry was not solidly established in the scientific world. It barely had any institutional attachments to speak of, despite a committed community and a comparatively large amount of literature available on the subject. This situation made it fragile in the face of criticism. According to some chemical practitioners of the eighteenth century, the biggest adversary of chemistry was alchemy, a field with which chemists entertained a complex relationship. Though recent scholarship has done much to shake off the image of chemistry as a field viewed with nothing but distrust by the public, the field had been through a lot of negative press as it entered the eighteenth century.<sup>464</sup>

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<sup>464</sup> For reasons of brevity, I will not enter upon a discussion of the relationship between chemistry and alchemy. This is not to say that alchemy and chemistry did not have plenty of overlap, or for that matter that there was a point in time during which alchemy 'became' chemistry. I am simply referring to the existence of the field of chemistry, as was referred to by the majority of actors working within the field of mineral waters during the eighteenth century. See:

The French seventeenth century had been characterised by state-fuelled adversity against obscurantism and anything perceived as occult. Astrology for example, fell considerably out of favour at the court of Louis XIV.<sup>465</sup> Alchemy suffered a similar fate, being caricatured as a secretive dark art of secrecy with a history of failed promises. The Affair of Poisons (1677–1682) escalated this sentiment and heightened the general scepticism against those who handled chemicals.<sup>466</sup> Operating a laboratory became more regulated, and infractions were threatened with severe punishment.<sup>467</sup> These threats were more than mere words, and there were examples of people who were burned at the stake under suspicions of manipulating poisons, including late into the period.<sup>468</sup> This naturally put some restrictions on the ability of chemists to hone their craft. It also encouraged them to actively distance themselves from alchemy. If the ancient art was to be associated with obscurantism and regicide plots, it had to be at least performatively abandoned.<sup>469</sup> It appears that the rhetoric of distinction yielded some success as early as 1682 with one Edict proclaiming the following:

it is defended that any person of any profession and condition excepted physicians, professors in chymistry and master apothecaries to have any laboratory,

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Bernadette Bensaude-Vincent and Jonathan Simon, *Chemistry, the Impure Science* (Imperial College Press, 2008).

<sup>465</sup> Chantal Grell, “Astrologie et politique au milieu du XVIIe siècle, : les “nativités” et “révolutions” de Bouilliau et de Des Noyers,” *Dix-septième siècle* 266, no. 1 (2015).; Micheline Grenet, *La passion des astres au XVIIe siècle. De l'astrologie à l'astronomie* (Paris: Hachette, 1994).; Hervé Dreviron, *Lire et écrire l'avenir . L'astrologie dans la France du Grand Siècle* (Seysse: Champ vallon, 1996).

<sup>466</sup> The Affair of Poisons was a series of scandals which took place during the reign of Louis XIV. A large number of people, many of them well-connected to the court, were implicated in accusations of poisoning, practicing of black magic among other forbidden proceedings. Over 400 people were accused in the so-called “Ardent Chamber”, an exceptional court of law created for the circumstances. Overall, thirty-six people were executed and heightened fears of poison-related intrigue went on for many years.

<sup>467</sup> On the general unfolding of the Affair of Poisons, see: Jean-Christian Petitfils, *L’Affaire des Poisons, Crimes et sorcellerie au temps du Roi-Soleil* (Paris: Perrin, 2009).; Anne Sommerset, *The affair of the poisons : murder, infanticide and satanism at the court of Louis XIV* (Londres: Orion Publishing, 2003).; Éric Le Nabour, *La Reynie. Le policier de Louis XIV* (Paris: Perrin, 1993).

<sup>468</sup> See a 1778 example of such an execution in: *Arrest de la Cour de Parlement de Toulouse, qui condamne le nommé Pierre Coulet à être brûlé pour crime de Poison, & qui fait un nouveau Reglement pour la vente du Poison, & autres Minéraux*, (Toulouse, de l'imprimerie de Noble J.A.H.M.B. Pijon, 1778)., consulted in: 78 B 1, Cours et juridictions antérieures à 1789, Archives départementales de la Haute Loire, le Puy en Velay.

<sup>469</sup> This was to a large extent, a rhetorical construction. See: Fors, *The Limits of Matter: Chemistry, Mining, and Enlightenment*. On the endurance of alchemy, see: Marieke M. A. Hendriksen, “Critiquing Chrysopoeia? Alchemy, Chemistry, Academics, and Satire in the Northern Netherlands, 1650–1750,” *Isis* 109, no. 2 (2018).; Lawrence Principe, “Rêves d’or: La surprenante longévité de l’alchimie au coeur de la chimie,” *L’Actualité chimique* 424 (2017).; Lawrence Principe, *New Narratives in Eighteenth-Century Chemistry* (Dordrecht: Springer, 2007).; William R. Newman, *Atoms and Alchemy: Chymistry and the Experimental Origins of the Scientific Revolution* (Chicago: University of Chicago Press, 2006).

and to work on any preparations of drugs, or on distillations under the pretence of chymical remedies and experiments without having beforehand obtained permission by letters of the great Seal<sup>470</sup>

While most experimentation was heavily restricted, chemistry professors and apothecaries had become exempt from these laws. Chemists, especially those working with non-lethal products were seen as less suspicious than others. This is an important piece of background explaining why the chemical analysis of mineral waters was able to gain momentum even in this delicate time.

The restrictions on what types of experiments were allowed in chemical laboratories did carry on well into the eighteenth century. In 1747, Letters patent were written to allow some individuals to distillate water. Those letters show similar restrictions to the 1682 Edict, by saying that with the exceptions of chemists and approved physicians, no one could be allowed to make chemical experiments, especially those related to the search for the Philosopher's stone. The letters also listed the kind of material that was allowed in laboratories. They mentioned acids, retorts, distillation apparatus, while making strict restrictions on crucibles and any other kind of instrument that could be used to melt metal.<sup>471</sup> By the middle of the century, chemistry was still not completely free to experiment, but water chemistry for the most part, could escape the bulk of negative connotations.

The surge in popularity of mineral waters therefore came at an opportune time. By accurately appraising waters, chemists were handed out a chance to prove the worth of their expertise. Instead of empty promises of gold, they could claim to help the public, the sick and sufferers, out in the open. If chemistry could properly analyse mineral waters, but most importantly if it could convince the world of the accuracy of its results, this represented a good case for the value of the field.

This ambition presented some immediate difficulties. Mineral waters were known to be a delicate product, unstable, difficult to transport and famously quick to lose its healing potential over time. These difficulties, however, were not dissimilar to the kinds of challenges with which chemical practitioners already engaged. The chemistry teacher Rouelle defined chemistry as “a physical art which by means of certain operations and instruments teaches us to separate from bodies several substances which enter into their composition and to recombine them anew among them or with others to reproduce the original bodies or to form new ones.”<sup>472</sup> Mineral waters in that sense were the

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<sup>470</sup> État des status à remettre à M. Chirac, (1707), AL/1, BIU. “par l'Edit du Roy enregistré au parlement le 31 aoust 1682 article 11. il est defendu a toutes personnes de quelques profession et condition quelles soient excepté aux medecins, professeurs en chymie et aux maistres apothicaires d'avoir aucuns laboratoires, et d'y travailler d'aucunes preparations de drogues, ou de distillations sous pretexte de remèdes chymiques ou experiences sans avoir auparavant obtenu par lettres du grand Sceau la permission”.

<sup>471</sup> Lettres Patentes pour les distillateurs d'eau, (1747), Registre 3, BIU.

<sup>472</sup> Cited in: Kim, *Affinity, that Elusive Dream: A Genealogy of the Chemical Revolution*, 194.

perfect case study for the capabilities of eighteenth-century chemistry. As more and more analysts published their works on mineral waters, they brightened the image of chemistry, and paved the way for its inclusion in scientific institutions.

## Venel and his lifelong mission of water analysis (1753–1779)

The first attempt at analysing the waters of France on a large scale took place between 1667 and 1674. It was conducted by the academicians Samuel Duclos (1598–1685) and Claude Bourdelin (1667–1711).<sup>473</sup> They had been summoned by statesman Colbert (1619–1683) to conduct this extensive set of analyses, and later published an important treatise on their findings.<sup>474</sup> The order mandated that all mineral waters in the kingdom had to be “distilled” in order to obtain an accurate survey of their location and properties.<sup>475</sup> This was an indication of the trust that was placed in the capabilities of the chemical arts, or at the very least in the technique of distillation, as a method of water-appraisal. Duclos and Bourdelin’s treatise represented an extensive amount of work. It should be noted however that these analyses were all conducted on bottled waters that had been shipped to Paris for the occasion. The authors alluded to the need of performing analyses directly at the spring in future endeavours.<sup>476</sup>

The place of iatrochemistry in the evaluation of mineral waters has been aptly covered by Michael Bycroft’s study which concerns the seventeenth and first half of the eighteenth century. He concludes that “academic chemists and physicians outside the Academy shared an interest in using the composition of mineral waters as a guide to their medical efficacy.”<sup>477</sup> Although Bycroft focuses on the role of the practitioners themselves rather than that of institutions and government bodies, his study clearly demonstrates that analysis was an established method of water assessment. Bycroft also suggests that analytical knowledge was shared by most physicians with an interest in mineral

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<sup>473</sup> Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.”, 17.

<sup>474</sup> Samuel C. Duclos, “Observations sur les eaux minérales de plusieurs provinces de France, faites en l’Académie royale des sciences en l’année 1670 et 1671,” (Paris, de l’imprimerie Royale, 1675).

<sup>475</sup> Jean Baptiste Colbert, “Lettres, instructions et mémoires de Colbert, 5, Fortifications, sciences, lettres, beaux-arts, bâtiments, publ. d’après les ordres de l’Empereur,” (par Pierre Clément, impr. impériale, 1861–1873), 291.

<sup>476</sup> Duclos, “Observations sur les eaux minérales de plusieurs provinces de France, faites en l’Académie royale des sciences en l’année 1670 et 1671.”, 4–5. “en attendant les occasions de les aller observer e leurs sources, l’on a fait apporter de diverses Provinces, avec beaucoup de soin, pour les examiner dans les Assemblées ordinaires des Physiciens de cette Académie.”

<sup>477</sup> Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.”, 26.

waters. As his study ends in 1750, I will pick up where he left off, with what was the first in-person systematic attempt at analysing the waters of France.

This attempt started in 1753, when the chemist Gabriel François Venel (1723–1775) was given the task of analysing the mineral waters of the French kingdom. Venel’s mission has been studied by Christine Lehman, and much of the retelling that follows has been directly informed by her work.<sup>478</sup> I have chosen here to retell it for three different reasons. First, Venel was an influential and central figure of the field of chemical analysis in eighteenth century France, and his work and connections will often feature in following chapters.<sup>479</sup> Second, the challenges encountered by Venel in his mission are highly informative regarding the kind of support which was needed in order to complete such an ambitious endeavour. These challenges have directly informed later analytical efforts, particularly those of the *Société*, making Venel’s mission a crucial piece of context. And third, Lehman’s account of events is presented in her thesis within the context of Venel’s life. My aim here is to go beyond this biographical framing, in order to place Venel’s mission as an example of the tightening relations between chemical analysis and mineral water regulation. For these reasons, the following account of Venel’s mission will be based on Lehman’s research, enriched with my own findings and connections with the longer history of water analysis.

Venel was born in 1723 in the town of Tourbes. He studied medicine at the Faculty of Montpellier and obtained his license in 1742. He then visited Paris for a time, during which he studied chemistry with the public teacher Guillaume-François Rouelle (1703–1770). He praised his master highly, crediting him for his subsequent interest in chemistry.<sup>480</sup> While in Paris, Venel made the acquaintance of Denis Diderot, which most likely led to Venel’s best-known contribution: the writing of the majority of the articles in the *Encyclopédie* which pertained to chemistry. His most famous article was the entry “Chymie” (meaning “Chemistry”), which appeared in the third volume.<sup>481</sup> He was also selected to become a royal censor in the field of chemistry books.

During this time, the government ordered a kingdom-wide study of mineral waters to be performed by a competent chemist. Christine Lehman suspects that a favourable intervention by the director of censorship and *Encyclopédie*

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<sup>478</sup> In my own archival research, I have encountered the figure of Venel, his analytical work, and its reception, many times, and all the texts I have been able to unearth have directly supported Lehman’s conclusions. This is why I lend a lot of trust to her account of Venel’s mission here. Christine Lehman, “Gabriel-François Venel (1723–1775) : sa place dans la chimie française du XVIIIe siècle” (Thèse de doctorat Université Paris-X - Nanterre, 2006).

<sup>479</sup> See Chapter 6 in particular.

<sup>480</sup> Venel talked of his teacher in highly positive term, saying that all french chemists got the “first taste of Chemistry” thanks to Rouelle. Diderot, Rond, and Jaucourt, “Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.” Volume IV, Article “CHYMIE ou CHIMIE”, 408. “tous les chymistes François”, ont le “premier goût de la Chimie est postérieur aux premiers cours de M. Rouelle”.

<sup>481</sup> Ibid.

protector Malesherbes (1721–1794) might have been at the origin of Venel’s selection. Venel was given the task, which he was to fulfil with the help of the apothecary Pierre Bayen (1725–1798), a fellow alumnus of Rouelle’s chemistry courses. Bayen was to perform the experiments, while Venel investigated the therapeutic principles of the waters, interpreted the results of the experiments and wrote the reports. The pair received a passport from Sénac, the First physician, insuring them free passage throughout the kingdom. The passport in question made sure to address any potential official that they could meet on the way, certifying the necessity of Venel and Bayen’s crucial mission.<sup>482</sup> Venel’s name figured prominently on the passport, since he was the one responsible for the mission, but Bayen was also mentioned by name.<sup>483</sup> For their work and time spent on the mission, they were compensated by a pension of 3,000<sup>l</sup> a year, and the promise of a job at the end of their long journey.<sup>484</sup> They were expected to analyse all of the major springs of France, as well as a few foreign waters which were also routinely shipped to the French kingdom.

Venel and Bayen started their mission in the south-west of France, which was familiar territory for Venel. They performed several analyses until 1754, when they were summoned on a special mission to go analyse the new waters of Passy. Their work on this was published shortly thereafter.<sup>485</sup> They then travelled back south to continue their mission. But in 1756, the onset of the Seven Year’s War interrupted their work. Using government funds for scientific travels was not seen as necessary in war time, and the mission was put on hold.

Venel in the meantime, resumed writing articles for the *Encyclopédie*. According to Lehman’s account, mineral waters were one of the central points of focus of his scientific career. In 1761, upon completing his Encyclopaedic work, Venel fully intended on continuing his analyses. He apparently placed an order for a selection of books on the subject from his friend Rast de Maupas. He was regularly seen asking the Montpellier Faculty, where he taught chemistry, for time-off so that he could pursue his life’s work. He briefly

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<sup>482</sup> Venel (sr) docteur en médecine, chargé d'examiner les eaux minérales du royaume, avec le sr Bayen: passeport, (4<sup>th</sup> June 1753), O/1/97, fol. 156–157, AN. “Passeport pour le Sr Venel doteur en medecin a Vers. le 4 juin.” “A tous Gouvernement, Lieutenant Généraux en nos provinces et Armées, Gouvernement particuliers de nos villes et [illisible], maitre et echvenins d'icelle, capitaine et gardes de nots portes ... magistrats, officiers de justice, Polices, Eaux et forêts, et maréchaussées, gentishommes et eclesiastiques communautés seculiere et regulieres ... Salut”.

<sup>483</sup> Ibid, “Le S Senac Cons en nost Conell noust ayant représenté quil étoit important pour le bien de nos Sujets de nommer quelqu capable d'examiner avec toute l'attention nécessaire les Eaux mineralles qui se trouvent dans les differentes villes et autres endroits de nôtre Royaume A cet effet nous vous mandont et ordonnons de laisser surement et librement passer dans l'entendüe de nos Provinces [...] Le S Venel”.

<sup>484</sup> The selection of Venel was not without critics. The physician Théophile de Bordeu had eyed the position. Upon being rejected, he called Venel a good chemist but a terrible physician, ending their prior friendship. Lehman, “Gabriel-François Venel (1723–1775) : sa place dans la chimie française du XVIIIe siècle.”

<sup>485</sup> Venel and Bayen, “Analyses chimiques des nouvelles eaux minérales de Passy.”

considered going back to do the analyses by himself, but such an operation could simply not be done without adequate funding. Both the travelling and the analyses themselves were expensive, and Venel was no rich man. He lived on his own physician's practice and his teaching in Montpellier, but he had no estate. In 1765, he attempted to publish an early version of his results, to no avail. He appears to have lost hope for a time, declaring in 1767 that he could only ever hope to finish his work on mineral waters "if God lends me life and health".<sup>486</sup>

These struggles were not surprising given the amplitude of the task at hand. Even if Venel had restricted himself to visiting only the waters of France, and only those of established reputation, this still left him with dozens of analyses to do and involved travelling in every region of the kingdom.<sup>487</sup> This was the kind of work that only the richest of patrons could fund, and since no prince or other wealthy philanthropist were willing to pay for the ordeal, the mission remained dormant for some time.

It was not until 1773 that things started moving again. With the war long fought and lost, Venel was given four years of funding to complete the mission he had started decades earlier. He chose to keep his job at the Montpellier faculty, and went to work on his analytical work during the school holidays. He travelled much during this time, even analysing the waters of Spa, which were admittedly very far from his home in the south-west of France. When he could not visit a spring in person, he sometimes got locals to send him samples of evaporated residue.<sup>488</sup> During his work, since he was without assistance this time, he apparently enlisted the help of his students in Montpellier. I have found that on several occasions, he also received help from local analysts when he visited various springs. He worked for example with the intendant of the waters of Montbrison, Richard de Laprade (1744–1797), during his trip in the Lyon region.<sup>489</sup>

When he visited a spring, Venel tried to obtain as much information on the water as possible. Once he had performed the analysis, he questioned the locals about the presence of baths, showers, the ways of taking the waters, and asked for details about therapeutic applications. He planned his book structure accordingly, intending to dedicate the first volume of his findings to the analysis per se, the second to the most important springs of the kingdom, ending on a final volume on baths, showers and other ways of taking the waters.<sup>490</sup> This attention to detail suggests that Venel was inspired by contemporary

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<sup>486</sup> Lehman, "Gabriel-François Venel (1723–1775) : sa place dans la chimie française du XVIIIe siècle." "Je l'acheverai certainement si Dieu me prete vie et santé".

<sup>487</sup> See the map of the mineral waters of France in Chapter 2.

<sup>488</sup> This technique was seen as a compromise, making the results of the analysis less reliable than with a visit to the spring. See chapter 8 for details on dry analysis.

<sup>489</sup> Analysis of the waters of Sail sous Couzan by Laprade, (1775), Ms 120, f279–280, AAL.

<sup>490</sup> Correspondence from Le Roy, (22<sup>nd</sup> July 1778), SRM 95 dossier 1 pièce 12, ASRM. Traité écrit "par l'ordre et aux frais du Gouvernement".

works on mineral springs, which often attempted to paint a complete picture of each spring.<sup>491</sup>

In his final letter to Rast de Maupas, in 1775, Venel seemed confident in his capacity to finish both his mission and manuscript. This was however, not to be. Venel died a few months after, of the complications that ensued from a leg injury. He named no successor for his mission. According to Lehman, Venel had at the time of his death analysed around a hundred mineral springs, and written full reports for about twenty-five of them, making him by far the most prolific analyst of the current study.<sup>492</sup>

Because Venel's work had been conducted on a royal grant, his notes could not be given to his family as part of his inheritance. This is one of the strange issues that arose from the public nature of his mission. While Venel could not fund the mission himself, and needed the support of the government, the fact that he relied on a government allowance meant that the usual rules of wills did not apply. Despite his brother's attempt to obtain the manuscript, with the intention of continuing the work, it was given to the physician Charles Le Roy (1726–1779).<sup>493</sup> He started to rework the manuscript, and wrote a few reports based on Venel's notes, but quickly became discouraged by the amount of work that was ahead of him.<sup>494</sup> In particular, recent discoveries in pneumatic chemistry, regarding the discovery of "fixed-air" caused issues.<sup>495</sup> In just a few years, the study of the air found in some mineral waters had gone from an intriguing novelty to an absolute necessity. This meant that parts of Venel's analyses had become outdated. Le Roy still believed that Venel's work should be published, and that the results could be very valuable to the wider

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<sup>491</sup> Most printed works that took a mineral spring as their prime object of study included all sorts of detail about the history, geography, local culture, and installations present at the spring. See for example: Limbourg, "Traité des Eaux Minérales de Spa.", chapitre 4, 69–83.

<sup>492</sup> Correspondence from Le Roy to Amelot, (22<sup>nd</sup> July 1778), cited from: Lehman, "Gabriel-François Venel (1723–1775) : sa place dans la chimie française du XVIII<sup>e</sup> siècle." "Le manuscrit de M. Venel ne contient que les matériaux de la seconde partie. On y trouve les descriptions, analyses et propriétés de vingt cinq Eaux minérales qu'il a lui meme rédigées et mises au net. On y trouve des matériaux épars de la description et de l'analyse de soixante et une Eaux minérales, que j'ai rédigées. Il avoit enfin visité plusieurs Eaux minérales qu'il avoit seulement fait évaporer et dont j'ai analysé les résidus au nombre de quinze."

<sup>493</sup> Le Roy had once been Venel's competition for the chair of medicine in Montpellier. He was also an *Encyclopédie* contributor, most notably writing the basis for the article "Mineral Water". Le Roy also said in a letter that he had himself attempted an analytical endeavour of this kind some years before, but had abandoned it given the size of the work that had to be done. See: Correspondence from Le Roy, (22<sup>nd</sup> July 1778), SRM 95 dossier 1 pièce 12, ASRM.

<sup>494</sup> Correspondence from Le Roy to Amelot, (22<sup>nd</sup> July 1778), cited in: Lehman, "Gabriel-François Venel (1723–1775) : sa place dans la chimie française du XVIII<sup>e</sup> siècle." "Il faudroit encore bien du temps, du travail, des voyages longs et dispendieux pour nous mettre en état de compléter l'ouvrage de mon confrere, de maniere à répondre dignement aux vues sages et bienfaisantes du Gouvernement."

<sup>495</sup> Correspondence from Le Roy, (22<sup>nd</sup> July 1778), SRM 95 dossier 1 pièce 12, ASRM. "Quant à ce qui concerne l'analyse ; les découvertes qu'on a faites sur l'air-fixe exigeroit seules des travaux recommencés et suivis sur beaucoup d'Eaux minérales. Un grand nombre d'autres objets de leur analyse demanderoient pareillement de nouvelles recherches."

community of water analysts. But Le Roy too, was not able to commit to his publishing plans, and his passing in 1779 meant that Venel's manuscript had to change hands once more.

After a few intermediates, the notes eventually landed in the hands of Pierre Thouvenel (1747–1815), who was chosen not for his confusingly similar name to Venel but more likely for his position as the intendant of the waters of Contrexéville and his recent analytical work of said water.<sup>496</sup> Thouvenel wrote an overwhelmingly negative report on the manuscript, noting that Venel's handwriting was hard to read, his abbreviations were not always clear, and many of the analyses would need to be redone. He subsequently asked for an exorbitant amount of money to finish the manuscript, which was unsurprisingly never granted to him. Given that Thouvenel was much younger than Venel, and more interested in the link between mineral waters and natural history, it is not impossible that he might simply not have had much interest in finishing the admittedly exhausting task of turning these many notes into a finished, printed work. Thouvenel was much more interested in the new science in town, mesmerism. After the downfall of Mesmer in Paris, Thouvenel abandoned the capital, his interest in mineral waters, and tragically, Venel's manuscript disappeared with him.<sup>497</sup>

The loss of Venel's findings was grieved by many analysts.<sup>498</sup> Le Roy himself had considered publishing the manuscript despite the flaws he could see, because of the "shortage [*disette*]" that existed for good books on chemical analysis.<sup>499</sup> Years later, a physician at the spring of the Mont d'Or mentioned that many had been inspired by Venel's attempt at a complete analysis of French waters, but no one managed to succeed in writing such a book.<sup>500</sup> Venel and his work were to become much-regretted by the community of water analysts.

The struggles faced by Venel were representative of the issues that could arise with any other project of similar nature. Analysing dozens of mineral springs spread across a large territory required some serious financial and human resources. When Venel was sent to do the analytical work by himself, he still had to ask for help many times along the way. Even the issues in sorting the succession of the manuscript are telling. They showed those who cared for

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<sup>496</sup> Pierre Thouvenel, "Mémoire chymique et médicinal sur les principes et les vertus des eaux minérales de Contrexéville en Lorraine," (A Nancy, chez Babin, Imprimeur Libraire, à Paris chez Valade, Libraire, 1774).

<sup>497</sup> The following reference claims to be the notes of Venel's notes, showing that at some point, they probably were meant to end up in the hands of the *Société*. The folder is however empty, with no explanation as to what happened to the manuscript. See: [missing] Venel's manuscript notes, SRM 95, dossier 1, pièce 12, ASRM.

<sup>498</sup> See the many mentions made by other analysts in Chapter 6.

<sup>499</sup> Correspondence from Le Roy, (22<sup>nd</sup> July 1778), SRM 95, dossier 1, pièce 12, ASRM. "disette".

<sup>500</sup> Dufour mentions the physicians who have followed the example of the late Venel in a letter to the *Société*. Correspondence from Dufour to the *Société*, at the Mont d'Or, (1783), SRM 90A, dossier 4, ASRM.

the science of mineral waters that publishing results, even early and incomplete results, could be crucial, lest they be lost to some mishandling or accident. The speed of change in analytical science was another critical issue. If an analysis could become dated in the span of a few years, then the task of analysing many waters was essentially impossible for an individual who could not compress that kind of time. And this was precisely where later efforts in gathering data about mineral waters differed. Rather than mandating another analyst with the same mission, subsequent projects were distinctly communal in nature.

## Favouring chemical knowledge: the *Commission* and its recruitment of market workers

Upon the creation of the *Commission* in 1772, the analysis mission was still up in the air, and it would be just one more year before Venel would be back on the road. Those efforts were clearly linked. The First physician was behind the creation of the *Commission*, but his predecessor was also the one who handed Venel his passport, and likely briefed him on the mission to some extent. The First physician had therefore little incentive to ask the *Commission* to double up on a kingdom-wide analytical program. Instead, the *Commission* worked on cementing the place of chemistry as a desirable skill for those that worked with mineral waters. While intendants in the early parts of the century, like Fouet, Chomel and Giraud were more focused on the medical properties of their waters, in the time of the *Commission*, combining medical and chemical approaches was becoming increasingly necessary.<sup>501</sup>

The expanding place of chemistry in the toolkit of those working with waters can be shown very concretely thanks to a particular set of documents. The *Commission* upon its creation had to hire a number of people to work within the market of transported waters. It also had to vet the existing intendants who worked and supervised operations at the springs. In order to fill the positions of water distributors, inspectors and intendants, the *Commission* had to review many applications. The folders containing them have been kept in the records of the *Société*, providing compelling insight into which kinds of skills were put forward by people who were hoping to work in this market.

In a 1773 application, the apothecary Flaugergues de Rodez asked for a permit for the inspection of mineral waters in the Rouergue. The Abbe Marie, a local professor of mathematics, wrote a recommendation letter for him which stated: “These sirs ensure that Mr. Flaugergues deserves this favour from the Royal commission by his personal merit by his talents and primarily

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<sup>501</sup> See chapter 2, section 2, on Vichy.

by his knowledge in chemistry”.<sup>502</sup> In a second recommendation, Flaugergues was praised for being “more of a chemist than are ordinarily the apothecaries of provinces”.<sup>503</sup> Another document, described his education in chemistry with more precision.

After having done three courses in Chymistry in Toulouse, with M. Dubernat and two in Montpellier with M. Venel, he has come to paris where he has followed two more with M. Machym and with M. Rouelle, and two at the garden of the apothecaries.<sup>504</sup>

Clearly, this applicant had followed pretty much every chemistry course that was worth attending in his day. This diligence in attending chemistry courses was not mandatory, but it was rightfully praised here as a very useful skillset to win over other applicants. Flaugergues was granted the position, confirming the value of being a well-trained ‘provincial chemist’.

In 1773 still, during the creation of a bureau in the small town of Brioude, the topic of chemistry was again mentioned. The man who was named to become its director was “an apothecary who did his courses with m. rouële in paris and who is in a state to make analyses”.<sup>505</sup> Rouelle’s chemistry courses were probably the most famous and appreciated by the community of chemists. It is nonetheless notable to hear of them from a practicing physician in Brioude, for whom the costs involved in getting to the Parisian course were indicative of his interest. But the most interesting mention in this text were the potential applications of this knowledge of chemistry. The applicant would not only be a good bureau tenant if hired, but he could also be an asset to the *Commission*, since he was both able and willing to perform analyses on his local waters. The bureau creation went through, and the applicant was given the job.

Another file shows that some applicants studied chemistry and medicine specifically with the intent of becoming intendants down the line. In 1775, Laviaille, the intendant of the waters of the Mont d’Or asked that his title be passed to his son upon his death. An internal letter at the *Commission* gave a

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<sup>502</sup> Support to the application of Flaugergues de Rodez by the Abbe Marie, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM. “Ces messieur assurent que Mr Flaugergues merite cette faveur de la commission Royale par son merite personnel par ses talents et principalement par ses connoissances en chimie”.

<sup>503</sup> Support to the application of Flaugergues de Rodez, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM. “il est d’ailleurs chimiste plus que ne sont ordinairement les apoticaire de province”.

<sup>504</sup> Support to the application of Flaugergues de Rodez, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM. “Après avoir fait trois cours de Chymie a Toulouse, chès M. DuBernat et deux a Montpellier chès M. Venel, il est venu a paris ou il en a suivi deux autres chès M. Machym un chès M. Rouelle, et deux au jardin des apoticaire.”

<sup>505</sup> Correspondence to the *Commission* from Brioude, 29e assemblée, (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM. “Celuy que j’ay l’honneur de vou presenter pour Directeur est un apotiquaire qui a fait ses cours chez m rouële a paris qui est en etat de faire des analyses”.

very positive assessment of the request, stating “The sir Laviaille the son is also a man of merit. he knows perfectly the mineral waters of the Mont d’Or. he defended in Montpellier a very well-made thesis on their principles, and their properties. he has even given me a manuscript memoir on those waters.”<sup>506</sup> The agent, impressed by the willingness of Laviaille’s son to go through the trouble of studying at the Faculty of Montpellier, decided that he should indeed inherit the position.<sup>507</sup>

This was not the only case of father and son working together with waters. The medical profession was often familial in this way, so it is to be expected that families of apothecaries and physicians also transmitted interest in mineral waters. In 1777, the intendant of the waters of Neris and Saint Pardoux asked that the position be granted to his son upon his retirement. He explained that his family was coming from a long line of physicians, and that his son would be the twelfth intendant of mineral waters in the lineage. But despite this impressive record, the son had also “dedicated himself for three years to the study of his estate, under the best masters in the art; he cultivated in particular chemistry”.<sup>508</sup> While ancestry was used by applicants in order to get an edge on the competition, chemistry was also added as an important qualification.

The final case of this kind took place in 1778, right before the dissolution of the *Commission*. Terrede asked for the administration of the waters in Saint Santin. His recommendation letter stated that he knew the waters and their properties better than anyone, because in 1776, “he published a very exact analysis [of these waters] which has deserved the approval of chemists, and of physicians.”<sup>509</sup>

Internal documents of the *Commission* showed that when reviewing applicants, the skills in analysis were actively sought after. In a note regarding the nomination of an inspector for the waters of Plombières, the *Commission* reviewer noted: “it would be a shame towards the public to give the positions of physician intendant or inspector of the Mineral Waters without them knowing

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<sup>506</sup> Support to the application of Laviaille, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM. “Le s Laviaille fils est aussi un homme de mérite. il connoit parfaitement les eaux minerales du Mont-dor. il a soutenu à Montpellier une thèse très bien faite sur leurs principes, et leurs propriétés. il m'a même remis un mémoire manuscrit sur ces eaux.”

<sup>507</sup> Ibid, “J'estime qu'il est juste que la C. R. accord au s Laviaille, la double demande qu'il fait, pour lui et pour son fils.”

<sup>508</sup> Demand for a permit inheritance in the Bourbonnais, 88e assemblée, (3<sup>rd</sup> March 1777), SRM 112, dossier 16, ASRM. “ce jeune medecin, doué des dispositions les plus heureuses, après avoir pris les grades, est venu dans cette capitale ou il s'est consacré pendant trois ans à l'étude de son état, sous les meilleurs maitres de l'art ; il a cultivé particulièrement la chimie, dans la vûe de succeder un jour à son pere et de remplir d'une maniere distinguée les fonctions d'intendant des eaux minérales.”

<sup>509</sup> Support to the application of Terrede, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113 dossier 17, ASRM. “m terrede les connoit parfaitement, il en publia en 1776 une analyse très exacte qui a mérité l'approbation des chymistes, et des médecins.”

the nature and the properties of those that they are entrusted with”.<sup>510</sup> He added that he believed all applicants should prove their intimate knowledge of the waters they were interested in supervising by sending “to the Royal Commission memoirs concerning the properties and the principles of these Waters”, as a matter of “public utility.”<sup>511</sup> In that particular case, the applicant had sent analytical memoirs regarding the waters of Plombières, but they were deemed insufficient, and further proofs of competence were requested. This shows that the applicant had been aware of the need to show chemical knowledge beforehand but had possibly underestimated the *Commission's* standards.

There was one interesting counter example to this celebration of chemistry, which is worth a mention. As of 1780, Dorliac had been granted the position of bureau director in Toulouse. He had a rival however, who explained in a letter to the *Société* that Dorliac had forbidden him for selling waters in his dispensary. He added that Dorliac had no knowledge of chemistry, making him a very poor choice for a mineral water distributor. He would never know when the waters had been altered, or when they might have lost their virtues. Dorliac responded in his defence that not all bureau tenants had to be chemists, and that plenty of good distributors were laymen when it came to the sciences, and that was perfectly fine. Someone who knew nothing of pharmacy could be seen as trustworthy because they were unlikely to concoct artificial waters instead of selling natural ones.<sup>512</sup> This letter is an important reminder that, proficiency in chemistry or medicine were by no means mandatory, especially for the positions of bureau tenants. And despite a growing emphasis on the sciences, the market was not only operated by chemists, nor would this ambition have been realistic.

These files show that there were different ways for applicants to boast their skills. Some did it by attending chemistry courses, others by publishing books on the subject, others still by finding positive attributes in their own ignorance. All were effective in securing them positions. But when it came to the higher positions, those of inspector or intendant, the stakes were higher. Being an intendant of mineral waters was an enviable and salaried position. These examples show that to some applicants, it was worth travelling to be taught the latest advances in chemistry, if it meant securing a lifetime position in the trade of mineral waters. For the *Commission*, hiring staff with competences in

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<sup>510</sup> Internal report on the application of Deguerre to become inspector in Plombières, 22e assemblée, (15<sup>th</sup> April 1773), SRM 111A, dossier 18, ASRM. “il seroit un malheur pour le public de donner des places de medecins intendans ou d'inspecteur des Eaux Minerales sans qu'ils connaissent la nature et les propriétés de celles qui leur seroient confiées”.

<sup>511</sup> Ibid, “il seroit necessaire pour eviter cet inconvenient d'exiger de ceux qui se presenteroient pour occuper de telles places qu'ils envoyassent à la Com Roy des memoires concernant les propriete et les principes de ces Eaux, je crois même qu'elle doit cette attention à l'utilité publique.”

<sup>512</sup> Correspondence from Lahens to Lassone, “Memoire que Monsieur Lahens apoticaire de la ville de Toulouse prend la liberté d'adresser à monsieur de La Sonne premier medecin du Roy”, (1780), SRM 93A, dossier 6, ASRM.

chemistry constituted an important asset. These modern intendants and inspectors could in turn produce new knowledge on the waters they administered by publishing memoirs, logging their observations and performing analyses when needed. Even as Venel passed away and his mission was interrupted, the network of medically trained spring workers would later be mobilised to fulfil his original purpose.

## The influential role of chemistry at the *Société*

The *Commission*'s role was to regulate the circulation of remedies and mineral waters; they had no other prerogatives. The *Société* on the other hand, was a much bigger institution, with multiple orientations. At the very least, it needed to take on the tasks of the two *Commissions* that preceded it, doubling its amount of work from the start. But this was not all it was created to do, and the *Société* had ambitions in many other areas of medicine, meaning that chemistry, although of notable importance at the *Société*, was not its single priority by a long stretch. I want to stress the importance of this point here, since the present thesis inevitably tends to present the *Société de Médecine* as an institution primarily concerned with the administration of mineral waters.<sup>513</sup>

To take a glimpse at the diversity of activities at the *Société*, and to put its work on waters into perspective, the *Histoire de la Société de Médecine* is a good source to discuss.<sup>514</sup> This publication presented the different memoirs that had been received and debated at the *Société* for the year 1776, and helpfully sorted them into categories, each corresponding to an area of medicine. The categories are listed in Figure 4.1, alongside the number of memoirs that were given in that category.

These numbers are only indicative for a single year, and there is much to suggest that the number of items per categories varied from year to year. What is of interest here is the inclusion of a dedicated category on mineral waters, which received a rather large number of memoirs, and the category “medical chemistry”, attesting of the *Société*'s interest in the applications of chemistry to medicine. But as is very clear from the table, these two subjects were although undeniably present, still just one facet of the *Société*'s work.

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<sup>513</sup> For a study on the *Société*'s work on medical topography, see: Moussy, “Les topographies médicales françaises des années 1770 aux années 1880, Essai d'interprétation d'un genre médical.” For a study of the *Société*'s work on epidemics, see: Hannaway, “Medicine, Public Welfare and the State in Eighteenth Century France: The Société Royale de Médecine of Paris (1776–1793).”, 145–227.

<sup>514</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”

Category	Number of items
Meteorological observations	3
Medical topography	6
Epidemics	3
Epizootics	21
Practical medicine	14
Surgery	9
Anatomy	5
Medical chemistry	9
Mineral waters	12
Botany and natural history of remedies	11
Diseases of grain	2
Medical physics	8

Figure 4.1 Memoirs discussed at the *Société* by category. Source: *Histoire de la Société de Médecine* (1776).

This interest in chemistry can be explained by different reasons, which are worth briefly mentioning because of their immediate relation to the *Société's* administration of mineral waters. For one, all of the Associates who practiced medicine had at least had the opportunity to receive training in chemistry. The Faculty of Paris and the Faculty of Montpellier both offered one course in chemistry that a lot of the graduates were likely to have taken. In addition, since many of the Associates lived in Paris, they had access to a plethora of free chemistry courses. Those who lived in other cities also had access to a selection of such courses, depending on the town.<sup>515</sup> In that way, even the Associates who specialised in more traditionally medical subjects like anatomy or epidemics probably had some working knowledge of the basics of chemistry. The commonality of this double-specialisation likely lessened the height of the disciplinary boundary between members. Medicine and chemistry were also closer than is sometimes described in part of the historiography on the eighteenth century.<sup>516</sup> Kim talks for example discusses the “intimate & necessary relationship” chemistry had with all kinds of health professions.<sup>517</sup> Even the *Commission* for the study of epidemics, despite having only six members, made a point of having a chemist on board. It is therefore not altogether

<sup>515</sup> John Perkins, “Chemistry courses, the Parisian chemical world and the chemical revolution, 1770–1790,” *Ambix* 57, no. 1 (2010).

<sup>516</sup> For an exploration of the links between pharmacy and chemistry, see: Simon, *Chemistry, Pharmacy and Revolution in France, 1777–1809*.

<sup>517</sup> Kim, *Affinity, that Elusive Dream: A Genealogy of the Chemical Revolution*, 256.

unexpected that this inclusion was kept in the much bigger institute that was the *Société*.

This co-dependent relationship between medicine and chemistry also came from wider dynamics surrounding the division of labour in early modern medicine. Despite growing criticism of the sharp divide between physicians, surgeons and apothecaries, the tripartite division was still firmly held in place by the physicians.<sup>518</sup> Traditional roles stipulated that physicians observed and prescribed, surgeons cut and operated, and apothecaries mixed and manipulated remedies. When applied to mineral waters, this would mean that apothecaries should analyse the waters, physicians should prescribe them, and surgeons should apply them to the body (in showers and baths for example).

A number of physicians agreed in principle that mineral waters should be investigated from both a medical and a chemical perspective. The physician Théophile de Bordeu (1722–1776) who closely worked with waters and was a correspondent of the *Commission* theorised that “everything in the body cannot be explained by Chemistry and mechanic alone”.<sup>519</sup> He argued in particular that mineral waters could not be only captured by chemistry, and that their efficiency was also due an internal vital force.<sup>520</sup> According to such a framework, neither disciplinary knowledge was sufficient in order to properly explain the effects of remedial waters by itself. And while not all agreed with Bordeu’s views, this idea of double expertise was widely shared among water analysts.<sup>521</sup> Chemists and physicians had to collaborate.

The chemists of the *Société* were therefore tacitly put in charge of the analysis of waters. As was stated during the creation of the *Société*, “we propose to give to the société of which the most Celebrated chemists are zealous members, the right to speak on [the waters’] analysis, on their virtues, and on all the details of their examination, and of their distribution.”<sup>522</sup> The physicians meanwhile, were charged with the prescriptions of the waters, as well as medical interpretations of the results of analysis.

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<sup>518</sup> On medical hierarchies, see: Rieder and Zanetti, *Materia Medica, Savoirs et Usages des Médicaments aux Époques Médiévales et Modernes.*; Philip Rieder, “La médecine pratique : une activité heuristique à la fin du 18e siècle ?,” *Dix-huitième siècle* 47, no. 1 (2015); Alexandre Lunel, *La maison médicale du Roi : XVIe–XVIIIe siècles, Le pouvoir royal et les professions de santé (médecins, chirurgiens, apothicaires)* (Champ Vallon Editions, 2008).

<sup>519</sup> Correspondence from Théophile de Bordeu to Sauvages de la Croix, (30<sup>th</sup> September 1757), Ms 106(5)2 ff., BIU. “tout dans l’organisme ne s’explique pas par la Chymie et la mécanique”.

<sup>520</sup> Dominique Boury, “Théophile de Bordeu : source et personnage du Rêve de D’Alembert,” *Recherches sur Diderot et sur l’Encyclopédie* 34 (2003), 15–16. ; Jacques Roger, *Les Sciences de la vie dans la pensée française au XVIIIe siècle* (Paris: Albin Michel, 1993).

<sup>521</sup> See chapter 6.

<sup>522</sup> “Observation sur le Mémoire dans lequel M Le Premier Chirurgien du Roi s’élève contre le projet des lettres patentes pour l’établissement de la société Royale de médecine”, (1778), SRM 114A–B, dossier 12, ASRM. “on se propose de donner à la société dont les chymistes les plus Celebres font des membres zélés, le droit de prononcer sur leurs analise, sur leurs vertus, et sur tous les détails de leurs examen, et de leur distribution.”

This division was not fully functional. The relationship between chemists and physicians was not an exact match of the relationship between chemists and apothecaries. Most chemists, especially at the *Société*, were already physicians. So technically, they had the expertise needed in order to both analyse and prescribe waters. But if they claimed the medical expertise, they might end up being forbidden from engaging in practical experiments. Physicians were, with reference to their professional role, not supposed to inhabit the realm of experiment. This meant that mineral waters, despite fitting quite well in the traditional divides of early modern medicine, also challenged them.

Overcoming these divisions was no straightforward task. In the eighteenth century, chemistry emerged as an established domain of knowledge, but it was very rarely a profession. Chemists were not a uniform group that could take concerted action, to claim their role as both theorists and technicians. Among them, water analysts were individuals with sometimes unclear ties to the authoritative figures of the field.<sup>523</sup> Many if not all of them were trained in medicine, sometimes as physicians, and other times as apothecaries, which made things complicated.

Despite these complications, by 1778, the idea that chemistry was needed in order to approach mineral waters was implemented rather firmly, in no small part because of the earlier efforts of the *Commission*. In a 1778 memoir responding to objections made by the First surgeon regarding the creation of the *Société*, the author stated “has the composition and the analysis of Remedies of all kinds not always been made by the physician-Chemists”?<sup>524</sup> This statement engaged in some rather clear erasure of the important role played by apothecary-chemists on the subject, but the mention is still interesting, because it made it clear that, from the perspective of the *Société*, medicine and chemistry were compatible on the question of remedies. The use of the term “physician-Chemists”, referring to individuals that engaged with both fields, made this obvious.<sup>525</sup>

Finally, an important element that helps in explaining the sensitivity of the *Société* towards chemistry was its closeness with the Academy of Science. The Academy had housed a chair in chemistry since 1699 and was one of the only places where one could be a chemist by profession in the eighteenth century. A lot of the Associates, including some of the chemists, held prestigious

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<sup>523</sup> See chapter 6.

<sup>524</sup> “Observation sur le Mémoire dans lequel M Le Premier Chirurgien du Roi s'élève contre le projet des lettres patentes pour l'établissement de la société Royale de médecine”, (1778), SRM 114A–B, dossier 12, ASRM. “la composition et l'analyse des Remèdes de toute espèce n'ont-elle pas toujours été faite par les médecins Chymistes”.

<sup>525</sup> *Ibid.* The use of this dual term is a noteworthy choice. There was a name in the eighteenth century for *savants* who engaged with multiple fields of knowledge, namely they were called *philosophes*. The choice to specify the two different expertise separately makes it clear that the *Société's* attitude towards knowledge was specific, and motivated by the demands that mineral waters placed on those who analysed them.

academic chairs. Macquer, Bucquet, and later Lavoisier were all *Société* Associates who also held academic positions in the domain of chemistry.

These reasons made the *Société* an inviting space for the practice of chemistry. To the *Société* Associates who were just physicians, this relationship with chemists was precious. In the 1790s discussions with the Faculty, a point of contention arose regarding the non-physician Associates, many of which were chemists.<sup>526</sup> The *Société* talked about the “sacred links” which united all members of the *Société*, including the Associates who practiced other sciences than medicine.<sup>527</sup> The Associates were willing to jeopardise a deal with the Faculty in a dire time, in order to secure the position of their non-physician members, testifying to the importance of those members. In one of its foundational texts, it was said that “people dedicated to Physics” (read, the wider natural sciences), should be included among the members of the *Société* in order to promote the “good of Medicine as a science”. That same text stated that in order to participate in this mission, there was no need to have taken “degrees in the faculties”.<sup>528</sup> The presence of chemists at the *Société* was not accidental, it was part of its design.

The first consequence of this design was that the *Société*, despite its medical orientation, produced seminal works in terms of chemical analysis. Chemical analysis required careful knowledge of chemical laws, reactivity, and technical know-how. This makes it all the more noteworthy that a medical institution acted as an authority on the matter. The *Histoire de la Société de Médecine* included an official protocol stating how the good chemical analysis of a mineral water had to be conducted.<sup>529</sup> As a matter of fact, this featured in the preface of the book. The passage started by stating that the king had entrusted the *Société* with the chemical analysis of waters.<sup>530</sup> It then listed the different steps that all analysts had to follow. This was no succinct description either, the entire protocol went on for eight pages of providing details regarding the specifics of the analysis. It first stressed the importance of taking physical measurements of temperature at the spring, adding “It is essential that the thermometers that will be used, be built with mercury; these are the only ones of which the operation is constant and regular”, thus showing a familiarity with a common issue of analysis.<sup>531</sup>

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<sup>526</sup> See section below.

<sup>527</sup> Texte à copier dans le plunitif, (January 1790), SRM 114A–B, pièce 10, ASRM. “liens sacrés”.

<sup>528</sup> “Observations sur l’établissement d’une Société de Médecine”, (ca. 1776), SRM 114A, dossier 4, ASRM. “on pourra joindre des personnes adonnées a la Physique, parce que pour concourir au bien de la Médecine comme science, il n'est pas nécessaire d'avoir pris des degrés dans les facultés”.

<sup>529</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, xx.

<sup>530</sup> Ibid, xx. “L’analyse des eaux minérales, dont le Roi a attribué la connoissance à la Société”.

<sup>531</sup> Ibid, xx. “Il est essentiel que les thermomètres dont on se servira, soient construits avec du mercure; ce sont les seuls dont la marche soit constante & régulière”.

The protocol then described the various reagents that had to be used on the waters, in order to identify what kind of substance it might contain. This is the kind of minutia that was included for each reagent:

5° One poured in the water a few drops of solution of silver, made with nitrous acid. When the liquor becomes lightly cloudy & of opal colour & when a matter under the form of small white scales is deposited, this is a clue as to the presence of vitriolic acid in the water, because this deposit is just moon vitriol. If on the contrary the mineral water becomes mat white by the addition of the silver solution & that a precipitate of white drops is formed, it is a proof that marine acid is contained in the water; as this deposit is a marine salt of silver or lune cornée.<sup>532</sup>

The protocol then went on to precisely describe the best method to extract the gas from a water, followed by the appropriate manner of performing a dry analysis. Once again, this part was very precise, stating exactly how slow the heating of the water had to be done, or describing the taste of the concentrated liquor that was obtained at half evaporation. It then described a large array of possible crystals, and the methods that could be used to identify them.<sup>533</sup>

Towards the end, the protocol also added that the description of the analysis could not be the only information included in the report. The analyst also had to be informed on the various diseases for which “observation will have proven that [the use of these waters] has been salutary.”<sup>534</sup>

All this detail was still seen as potentially fallible. So the author of the preface added that the experiments detailed above were “not the only ones that could be attempted”, stating that it was the responsibility of the chemist to use his *lights* to “supplement what we might have forgotten, or to attempt the experiments that are applicable only to a few mineral waters that are found more rarely.”<sup>535</sup> This indicates that the Associates were aware that, in order to truly enlighten waters, they also had to rely on the knowledge of others, particularly the knowledge of those who worked with the springs, and knew their unique properties better than most.

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<sup>532</sup> Ibid, xi. “5° On versa dans l'eau quelques gouttes de dissolution d'argent, faite par l'acide nitreux. Lorsque la liqueur devient légèrement trouble & de couleur d'opale & qu'il se dépose une matière sous la forme de petites écailles blanches, c'est un indice de la présence de l'acide vitriolique dans l'eau, car ce dépôt n'est que du vitriol de lune. Si au contraire l'eau minérale devient d'un blanc mat par l'addition de la dissolution d'argent & qu'il se forme un précipité en flocons blancs, c'est une preuve que l'acide marin est contenu dans l'eau; car ce dépôt est un sel marin d'argent ou lune cornée.”

<sup>533</sup> These procedures of analysis will be discussed in more detail in Chapter 8.

<sup>534</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, xxviii. “On indiquera les maladies dans lesquelles l'observation aura prouvé que leur usage aura été salutaire.”

<sup>535</sup> Ibid, xxviii. “Les expériences que nous venons de détailler, ne sont pas les seules que l'on puisse tenter ; c'est d'ailleurs aux lumières du Chimiste qui fait l'analyse à suppléer à ce qu'on a pu oublier, ou à tenter les expériences qui ne sont applicables qu'à quelques eaux minérales que l'on trouve plus rarement.”

## Reliance on correspondents for information gathering

The focus on gathering information was not just one of the many ambitions of the *Société*, it was one of its core pillars.<sup>536</sup> The idea of the correspondence originated from the *Commission* for the study of epidemics, the one Vicq d’Azyr was originally involved with.<sup>537</sup> This small institution revolved largely around the data it collected from town doctors and used it to study and curb the spread of disease amongst people or livestock. Vicq d’Azyr was in charge of this initial information collection, and he did so by using a questionnaire. This was his early assignment as a young doctor, and there were some issues with the way things ran. The questions lacked clarity and were worded in a way that did not encourage detailed responses. Many respondents gave laconic answers that were difficult to later compile in a comprehensive summary. But even though they did not contain the exhaustive descriptions that Vicq d’Azyr had hoped for, he did receive a large number of completed surveys.<sup>538</sup>

Those early respondents became the base that would later form the correspondence of the *Société*. Vicq d’Azyr was the *Société*’s secretary, or *Secrétaire*, meaning that he was in charge of receiving and answering all letters addressed to the institution, of redirecting them when necessary. Vicq d’Azyr turned out to be the *Société*’s most constant presence, as he remained perpetual secretary for the entirety of the institution’s existence, making his role in communicating with the network all the more central.

The correspondence stemmed from the *Société*’s academic ambition. According to a draft, the Royal Correspondence of Medicine was created to “maintain on all subjects of practical medicine a close correspondence with the most skilful Physicians of the Kind et of Foreign countries”. It aimed collecting “the best observations”, “the most interesting facts”, and the best contribution to the “progress of the art of Healing”.<sup>539</sup>

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<sup>536</sup> This can be viewed within a wider context of knowledge circulation and interaction between state and provinces. See: Lothar Schilling and Jakob Vogel, eds., *Transnational Cultures of Expertise, Circulating State-related Knowledge in the 18th and 19th Centuries* (Berlin, Boston: Walter de Gruyter GmbH, 2019). For a case on knowledge-gathering correspondences, see: Sven Widmalm, “A Commerce of Letters: Astronomical Communication in the 18th Century,” *Science Studies* 5, no. 2 (1992).

<sup>537</sup> See Chapter 4, section 2, on the *Commission*.

<sup>538</sup> Moussy, “Les topographies médicales françaises des années 1770 aux années 1880, Essai d’interprétation d’un genre médical.”

<sup>539</sup> Note on the establishment of the correspondence, “Correspondance étendue des médecins des provinces”, (ca. 1776–1778), SRM 114, dossier 14, ASRM. “La Soc. et Corresp. R. de Med. est destinée à entretenir sur tous les objets de med. prat. une corresp. suivie avec les Med. les plus habiles du Roy. et des pays Etrangers, à recueillir les meilleures observ<sup>o</sup> et à réunir les faits les plus intéressans et qui peuvent le plus contribuer aux progres de l’art de Guérir, à rechercher dans tous les auteurs & époques et la description des maladies sur le traitement desquelles on a le moins de connaissances et apporter dans les cas d’Epid. et d’Epiz. des secours dans les diffts endroits ou elles regnent.”

One of the issues that its founders saw with the state of medicine was isolation. As one Associate put it in an internal note, “extensive experience has proved that the art of healing when abandoned to its own devices only makes slow and uncertain progress.”<sup>540</sup> But if physicians were more diligent about exchanging their findings and shared their interrogations and theories with one another, then this state of isolation could be partially fixed. An advantage of a correspondence was that it did not require any of the physicians to leave their practice. They could continue to serve their communities, while participating in the *Société’s* work. As one of the legislation drafts put it, “the physicians of the kingdom and the Foreign physicians will form a single body in which all members will know one another and will help each other reciprocally with their Lights.”<sup>541</sup>

Early outlines of the correspondence often emphasised the importance of including prestigious foreign men of science, to “establish [...] a commerce of letters with the physicians of all of Europe”.<sup>542</sup> *Société* leaders hoped to gain insight on the use of remedies abroad, including in colonial spaces: “among the savages of america and in our colonies and in the countries of the Oriental Indies where the India company has extended its commerce.”<sup>543</sup> The official texts also focused on foreign prestige, but limited it to a mention of the foreign correspondents. The Letters patent of 1778 made a point of saying that although the *Société* Associates were very capable, they should join forces with their many correspondents, “the most celebrated Physicians of the Provinces & even of foreign countries.”<sup>544</sup> Later, it became clear that the foreign correspondence was politically motivated. In a series of documents from the early years of the revolution, the *Société* explained that many of its most prestigious

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<sup>540</sup> Ibid, “une longue experience à prouvé que l'art de guerir abandonné à lui meme ne fait que des progrès lents et incertains.”

<sup>541</sup> “Projet d’un nouveau règlement relatif au Régime de la société R de Médecine Rédigé par M De Lassone et qui doit être placé a la suite des lettres patentes”, (ca. 1778), SRM 114A–B, dossier 7, pièce 21, ASRM. “c’est ainsi que les médecins du royaume et les médecins Etrangers ne formeront qu’un seul corps dont tous les membres se connaîtront et s’aideront reciproquement de leurs Lumieres.”

<sup>542</sup> Mémoire et Projet approuvé pr M Dodun, Controleur Général pour l’établissement d’une académie de médecine, (24<sup>th</sup> November 1724), SRM114B, d1–10, ASRM. “Outre ces occupations particulières de l’académie experimentale et pratique de médecine, elle établira sous le bon plaisir du Roi un commerce de lettres avec les médecins de toute l’Europe”.

<sup>543</sup> Ibid, “pour prendre connoissance des principaux remèdes les plus expérimentés dans les pais étrangers et prendra aussi un soin particulier pour connoitre les principaux remèdes qui sont en usage tant parmi les sauvages de l’amérique que dans nos colonies et dans les pais des Indes Orientales où la compagnie des Indes a étendu son commerce.”

<sup>544</sup> Draft of the Letters patent, (1778), SRM 114A–B dossier 7, pièce 2, ASRM. “Nous avons composé une Société de personnes expérimentées dans la science propre au traitement des maladies de toute espece, & Nous leur avons ordonné de s’assembler, dans la vue de parvenir à former une collection, tant des observations que leur expérience personnelle leur permettoit de réunier, que de celles qui leur seroient procurées par les correspondances que Nous les avons excitées à entretenir avec les Médecins les plus célèbres des Provinces & même des pays étrangers.”

correspondents required direct support from the government. The correspondence was therefore suggested to be, at least in part, a diplomatic effort.<sup>545</sup>

But despite a somewhat grandiose tone, the correspondence was made up of a great diversity of informants. The people who wrote to the *Société* with precious information or pressing issues were not all official correspondents. The people working in and around the mineral water market or the people who were trying to get permits to sell secret remedies, most of them were not official correspondents.<sup>546</sup> This meant that the letters sent to the *Société* looked very different from one writer to the next. Some were well-written, in perfectly spelled French; others were barely legible and riddled with errors. Some included fanciful expressions and polite addresses, others were factual and to the point. The length varied, from detailed memoirs, sometimes printed ones, to simple notes. Some deferred, some antagonised, others made excuses or demands. But in general, there was no sign that the different levels of literacy influenced the priority given to the issues raised.<sup>547</sup>

The correspondence, thanks to the good reputation of the *Société*, attracted a large number of participants seeking personal prestige and community.<sup>548</sup> It was a lot more successful than the *Commission* for epidemics had ever been. Hundreds were involved as correspondents, and the large number of letters kept in the archives of the *Société* shows that these were active writers. In the 1780s, the *Société* described it as “an immense correspondence made very active by the works of several years.”<sup>549</sup>

It can seem curious that so many people took the time to send the fruits of their labour to the *Société*, without compensation or promises of rewards. But there were strategies in place which encouraged this behaviour. Town physicians were not paid for sending medical topographies or any other kind of intel

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<sup>545</sup> “Projet de conciliation avec la faculté”, (1789–1790), SRM 114A–B, dossier 11, ASRM.

<sup>546</sup> When I refer to “the correspondence”, I refer to the collective of all of those who wrote to the *Commission* and the *Société*, whether or not they were correspondents, and whether or not they ever received a response.

<sup>547</sup> Perhaps while attempting to gather the surveys on epidemics, Vicq d’Azyr realised that an overly dry tone could turn away many potential precious informants. (This has also been suggested by Moussy, in Moussy, “Les topographies médicales françaises des années 1770 aux années 1880, Essai d’interprétation d’un genre médical.”) So the tone was kept amicable, and since the contributions from the networks were made on the basis of trust and voluntarily, many answers from the *Société* expressed gratitude, even when the contributions were deemed insufficient.

<sup>548</sup> This kind of dynamic has been attested in other institutions. Being made a correspondent of a royal institution could encourage individuals a lot of work, even when not compensated, for the prestige of participating in the institution’s work. See an example of this in 1745, in which the author mentioned his nomination at the Academy of Lyon as the drive being his willingness to conduct analytical research: Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL.

<sup>549</sup> “Sur les moiens de rapprocher faculté et société”, (1789–1790), SRM 114A–B, dossier 11, ASRM. “La Société aurois aussi le bonheur (ou bon sens ?) de mettre sous l’autorité de la faculté l’inspection de tous les distributeurs de remedes, l’administration des eaux minerales & medicinales du royaume & une correspondance immense rendue tres active par les travaux de plusieurs annees.”

on their region. The reward was more symbolic. Being a *Société* correspondent came with some amount of prestige, which helped to connect isolated practitioners to a broader ambition. And while it would be naive to suggest that these people all worked selflessly for no other reward than the knowledge that they had participated in the great mission of furthering science, it would be equally misguided to deny that this dynamic had its place in the array of motivations. The terms ‘shared knowledge’, ‘Enlightenment’ and ‘progress’ were not only used by ambitious government planners; they regularly featured in the writings of correspondents too.

An important driver of the work sent to the *Société* was a straightforward desire for recognition. One correspondent in Clermont Ferrand expressed how “flattered” he felt that a “such a celebrated academy” approved of his memoir.<sup>550</sup> He expressed gratitude at the upcoming mention of his good memoir in a future volume of the *Histoire de la Société de Médecine*. He then talked about his happiness at receiving not only the approval for his work, but also “the honourable title of correspondent”.<sup>551</sup> This type of testimony demonstrates that the prestige associated with being made a correspondent was not a meaningless title. For this correspondent, upon receiving a response signed by Lassone, the First physician, he claimed that he felt so honoured that he hoped to continue his medical work up to his last day, and that he hoped to die a correspondent of the *Société*.

These encouragements were written in the *Société*’s laws. Article 39 of a draft stated that “among the number of physicians and physicists who will have sent memoirs, the Société shall distinguish those that will have shown the most zeal & exactitude in instructing themselves in all that relates to its Works”.<sup>552</sup> As a way of thanking them, they should receive congratulating letters signed by all the leadership of the *Société*, and even gratifications when it was deemed to be deserved. This was exactly what was done as a thank you to the Clermont Ferrand doctor, and it clearly had the intended effect.

There was also one, or rather two, monetary incentives to send in good memoirs. Every year, the *Société* handed out two prizes of 600<sup>l</sup> each to the authors of the most deserving papers that it had received.<sup>553</sup> One of its

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<sup>550</sup> Correspondence from the correspondent in Clermont to the *Société*, (1780), SRM 90A, dossier 23, ASRM. “je suis tres flatte que mon memoire sur la formation du pus aye merité laprobation de votre compagnie et qu’elle veuille bien en faire une mention honorable dans l’histoire d’un de ses volumes”. “jugement d’une academie aussi célèbre”.

<sup>551</sup> Ibid, “le titre honorable de correspondant;”.

<sup>552</sup> “Projet de reglements concernant les assemblées et les travaux de la Sté Roy de medecine”, (ca. 1778), SRM 114A–B, dossier 6, ASRM. “art 39. dans le nombre des medecins ou physiciens qui auront envoyé des memoires, la Société distinguera ceux qui auront montré le plus de zele & dexactitude à sinstruire de tout ce qui est relatif à ses Travaux; elle leur donnera des lettres de correspondant signés du president, du vice-president & du secretaire; il leur sera meme donne des encouragemens ou gratifications, lorsque ils auront rendu[?] plusieurs services.”

<sup>553</sup> “Nouvel Etat de distribution des Fonds accordés par le Roi à la Société Royale de Médecine sur le revenu des Eaux Minérales”, (1786), SRM 114A–B, dossier 19, pièce 7, ASRM.

beneficiaries was Jean Guillaume Chifoliau (1716–1799), a physician and surgeon in Brittany. He received the prize for the analysis he made of some of the waters of his region.<sup>554</sup> He expressed that “The flattering welcome that [the *Société*] has granted to my first analyses, strengthens my zeal”.<sup>555</sup> He expressed his hope that the *Société* would take a look at his second analytical attempt. Clearly, receiving the prize motivated him to make further research in the mineral waters of his region. He added though, that his zeal might be heightened yet, if the *Société* accepted to give him the title of intendant of the mineral waters for the city of Saint Malo. As was often the case, this kind of scientific work was motivated by a multitude of factors.

At times, the *Société* also circulated calls for specific information to their correspondents. There were at least three examples of this that I have been able to find. One took place in 1777, in the early years of the *Société*. The physician Bertrand-Lagrésie from Montpellier wrote to the *Société* explaining that a prospectus describing the creation of the *Société* had been received in his province, and that he had been particularly attentive to the exhortation towards “the physicians to make a particular study of the air temperature, and the quality of the waters of the different regions”.<sup>556</sup> Feeling invested in the medical mission of protecting the population from illness, he was happy to submit any of his recent findings regarding his local waters to the *Société*.<sup>557</sup>

In 1780, a similar letter reached the *Société*. It was written by the intendant of the waters of Châtel-Guyon, in response to a call by the *Société* for any information or books that had been written on the mineral waters of his region. He therefore explained what he knew of the current state of research:

in my region I know of only two springs which have been analysed, and of which the analysis has been printed under the name of two authors, in the

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<sup>554</sup> Chifoliau analysed three different springs according to the records of the *Société*. Those waters were the springs of Veaugarni, Saint Jouan and Saint Suliac. It is not clear exactly which analysis warranted the prize. Analysis of the waters of Veaugarni by Chifoliau, (1780), SRM 93A, dossier 19, ASRM.; Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM.; Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>555</sup> Correspondence from Chifoliau to the *Société*, (1780), SRM 92B dossier 36, ASRM.

<sup>556</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. “des avoir reçu en province le prospectus touchant letablisement de la société royale de medecine quon nous a fait lhonneur de nous communiquer dans lequel vous exhortés les medecins a faire une etude particule de la temperature de lair, et de la qualité des eaux des differents paÿs”.

<sup>557</sup> Ibid, “prenant dailleurs tout linterest que doit prendre caque medecin a la conservation des habitans ou il exerce sa profession, je me fais un devoir de faire de ce precepte la regle de ma conduite, pour macquitter du premier point juy lhonneur de preseanter a lillustre société royale de medecine la description dune maladie epidemique qui a affligé la ville de rayleux en 1773 [...] pour remplir le second point jay commencé des ce moment a faire les recherches les plus suivies sur toutes les eaux mineralles de la province du quercy”.

distance of a century to the next. unless there have been some manuscript memoirs, which are outside of my knowledge despite any probing I made.<sup>558</sup>

He then went on to explain that his own waters of Châtel-Guyon had only been analysed twice to his knowledge, once by Duclos in 1645, and another time by himself in 1773, an analysis which had made its way in Raulin's analytical treatise (page 133, he helpfully indicated). This type of letter was a good example of the importance of the *Société's* network. The Associates had the extremely convenient recourse of being able to send a letter to all correspondents of a region whenever they had a query, and be almost sure that someone would send a response.

The efficiency of this method highlights the logic behind not electing to hire another analyst to travel through the country, as Venel once did, to study all the waters one after the other. With the resources of the *Société*, there was no need to put such responsibilities on a single person, when the job could be just as well done by the hundreds of correspondents spread across the kingdom.

In 1783, the *Société* sent around what was probably the most ambitious fact-finding call regarding mineral waters. The former inspector of the mineral waters of the Roussillon<sup>559</sup> turned Associate Joseph Barthélémy Carrère (1740–1803) sent a letter to all correspondents asking for any information on the mineral waters of the kingdom.<sup>560</sup> The responses attest of the same dynamics as in the previous responses. One letter explained for example that the author was flattered to have been asked such an important question, and explained that he was in the process of arranging future research on his local waters.<sup>561</sup> In another response to Carrère's letter, Vallier from Montpellier explained that he had gone on a small fact-finding mission of his own in the region of Angoulême (where he exercised his profession) to find out if the region had any mineral waters and what works had been done on them. He concluded that “no remarkable spring by the analysis and the effects” could

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<sup>558</sup> Correspondence from the intendant of Châtel-Guyon to the *Société*, responding to Carrère, (1780), SRM 90 A, dossier 23, ASRM. “je ne connois dans mon department que deux sources que l'on eut analusé, et dont l'analyse euÿt été imprimée sous le nom de deux auteurs, dans la distance d'un siecle a l'autre. a moins qu'il n'y ayt quelques memoires manuscrits, qui ne sont point de ma connoissance quelque perquisition que j'ey pû faire.”

<sup>559</sup> Carrère professeur en médecine à l'Université de Perpignan : brevet d'inspecteur honoraire des eaux minérales du Roussillon, (28<sup>th</sup> June 1774), O/1/121, fol. 86, AN. “Aujourd'huy 28 juin 1774 le Roy Etant à Marly voulait faire connoître la bienveillance particuliere que sa Majesté accorde au sieur Carrere Professeur en médecine à l'université de Perpignan ci devant inspecteur des Eaux minérales du Roussillon, sa majesté a voulu lui conserver le titre de cette place dont il a si bien rempli les fonctions à la satisfaction Générale de tous les citoyens, et des gens de l'art ;”

<sup>560</sup> Renseignements sur les eaux minérales du royaume, réunis en réponse à la circulaire de Carrère, (25<sup>th</sup> February 1783), SRM 95, dossier 1, ASRM.

<sup>561</sup> Correspondence from Barbuot to the *Société*, (1783), SRM 95 dossier 1, pièce 117, ASRM.

be found.<sup>562</sup> He did note that since the country was rich in iron mines, traces of iron made its way into its waters. But mostly, the country was rife with charlatans who tried to convince the public that completely common waters were in fact mineral remedies.

Thanks to the responses to his letter, Carrère was able to publish a full *Catalogue* surveying every work that had been done on mineral waters in France for the past century. His book credited in the very first page of the preface the responses of the “Physicians, Chemists & Physicists” who answered his query and gave him the information they knew, sometimes going out of their way to make sure they responded thoroughly.<sup>563</sup> The over 500 pages of the volume attest of the diligence of the *Société’s* correspondents in responding to such questions.

## Enacting scientific authority through the evaluation of analysis reports

The quantity of information sent *via* memoirs and letters to Vicq d’Azyr was not always directly usable. While the *Société* wanted nothing more than receiving as much information as possible on the medical state of the provinces, the Associates also needed to evaluate the quality, credibility and accuracy of the papers they read. This was an essential component of the *Société’s* work regarding secret remedies for example (called ‘secret’ because the recipes were only known to the sellers). To be allowed to sell such remedies, their makers had to send a detailed list of ingredients which went into their composition, which the *Société* would then evaluate.<sup>564</sup> There were countless

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<sup>562</sup> Correspondence from Vallier in Montpellier to the *Société*, (25<sup>th</sup> May 1783), SRM 95, dossier 1, ASRM. “aucune source remarquable par l’analyse et les effets”.

<sup>563</sup> Joseph-Barthélemy-François Carrère, “Catalogue raisonné des ouvrages qui ont été publiés sur les eaux minérales en général et sur celles de la France en particulier, avec une notice de toutes les eaux minérales de ce royaume,” (A Paris, Chez Rémond, Libraire, quai des Augustins, n°41, 1785), ii. “La Société Roayle de Médecine, avoit invité, au mois de Mars 1783, les Médecins, Chimistes & Physiciens, répandus dans les Provinces, à me donner des Notions sur les Eaux Minérales des pays qu’ils habitent, sur leur nombre, leur situation & leur température”.

<sup>564</sup> This task was inherited from the *Commission*, and represented much of its activity. For example, in 1773, the *Commission* received the recipe for a remedy that was being sold in Bordeaux by Genotelle, who was a hernia specialist. The remedy contained eight different ingredients, including aspic oil, colophon, and black tar. A member of the *Commission* drew a report, based on this recipe. He concluded: “the application of a topical remedy [topique] of this kind cannot be hurtful. But it seems also that it could not be useful for the healing of the disease towards which it is destined. On that, the Sir genotelle gives no proof of its use.” The sale of that particular remedy was subsequently forbidden. Report on the remedy of Sir Genotelle, (7<sup>th</sup> June 1773), SRM 111A, dossier 20, ASRM. “Le topique, dont le Sr genotelle expert herniaire à Bordeaux, demande a faire la distribution et l’application, est composé du mastic en larmes, de colophone, de benjoin, de poix noire, de thérébentine, de cire neuve, d’huile d’aspic, et d’huile de romarin.” “l’application d’un topique de cette espece ne peut etre nuisible. mais aussi il ne

examples of the *Commission* and later the *Société* performing these kinds of checks. At a glance, the majority ended up in refusals, but some resulted in the granting of permits too.<sup>565</sup>

In the case of mineral waters, their composition was not the result of some laboratory concoction. Therefore, in order to evaluate the quality of waters, the members of the *Commission* and the *Société* needed to rely on chemical analysis. The Associates received analyses sent through the correspondence. Two conclusions had to be extracted from these reports. First, the reviewers had to assess whether the chemist had performed the analysis competently. If that had been the case, the reviewer could move on to the second task, which was to evaluate whether the results of the analysis suggested that the mineral water was of notable quality.

This was one of the main tasks that the chemists at the *Société* were given. Chemical analysis was not so standardised that any member could simply check for the validity of the method against an agreed-upon template. The protocol of the *Société* was indicative and left space for the individual interpretation. Evaluating the quality of a chemical analysis required up-to-date knowledge of chemistry.<sup>566</sup> To perform this feat, the *Société* asked its resident chemists Bucquet, Coquereau, Lassone fils, Cornette and Fourcroy.

*The positive reports: valuing precision and up-to-date chemical knowledge*

Much like for the remedies, the *Société* was slightly more likely to give a negative judgment of an analysis than a positive one. Out of the fourteen reports that I have come across, only five of them were positive. But the reports were noteworthy not simply for their verdicts but also for the reasons as to why a particular analysis was deemed successful or not. Those arguments give shape to the chemical standard that the *Société* was attempting to impose on the market of mineral waters.

The first positive report came from the time of the *Commission*, and was made by l'Épine, in 1776. That report was completely and unambiguously positive. L'Épine apologised for skipping many of the “remarks, observations and judicious observations” that the analyst had made in his summary, because they were too numerous, testifying to his “Lights” and his “zeal”.<sup>567</sup> He then

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paroit pas pouvoir être utile pour la guérison de la maladie à la quelle il est destiné. D'ailleurs, le sr genotelle ne donne aucune preuve de son utilité.”

<sup>565</sup> For the full archival records on secret remedies, see SRM 96 to SRM 107, Remèdes secrets, ASRM. There were also a number of applications for permits of secret remedies in the *Commission's* files, SRM 111A to SRM 113, ASRM.

<sup>566</sup> It can also be added that the *Société* was not the only institution which evaluated the quality of chemical work. While it sometimes claimed that it held the monopoly on judging the analysis of mineral waters, other scientific institutions had done the same task in the past. See for example the Academy of Arts and Sciences of Lyon, evaluating the work done on the waters of Orléanas. Report by Gavinet and Willermoz on the Analysis of the waters of Orléanas by Lanoix, (1778), Ms 120, f203–206, AAL.

<sup>567</sup> Report by L'Épine on the Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM. “J'omets Mrs une multitude d'autres expériences et de remarques,

added that if all mineral water inspectors took the time to study the waters under their responsibility with such care, knowledge of mineral waters would soon be complete. He finished his report by recommending the work for publication. This was about as positive as the report on a chemical analysis could ever get.<sup>568</sup>

Not all positive evaluations were quite this enthusiastic. In 1778, the analysis of the waters of Saint Santin made by La Martinière were reviewed by the *Société*, specifically by Bucquet and Coquereau. Their report stated that La Martinière's chemical knowledge was "as exact as they could be a few year ago", but those limitations only highlighted that "few people have the talent to make good analyses of mineral waters." Despite this rather backhanded compliment, the two chemists decided that the author's work was "sufficient to enlighten the aperitive and tonic properties of these waters". They concluded that the work "merits the approval of the *Société*."<sup>569</sup>

A similar tone was employed in the evaluation of the analysis of the waters of Martres by Cuel, in 1780. The reviewers pointed out that some of the theories regarding the origin of mineral waters were already known to most chemists, and that these waters had been analysed in the past by Duclos and Chomel. But despite failing to mention this, they believed that the analysis had been made with "care and exactitude", and that the author had used adequate experimental methods.<sup>570</sup>

Sometimes, the reviewers expressed enthusiasm despite pointing out minor errors. This was the case for the 1781 reports on the waters of Sainte Reine by Maret. The reviewers in that case were Andry (1741–1829) and Fourcroy, who said "we admit with much pleasure that we know of no analysis made with more care and sagacity, and that it would be desirable that waters more important than those of Ste Reine had been examined with the same exactitude."<sup>571</sup> This was very kind to the author, though he probably would have

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d'observations et de réflexions judicieuses contenues au memoire de Mr Dugau qui font honneur à ses Lumieres et dont on ne sauroit trop louer le zele;"

<sup>568</sup> Chifoliau's work, mentioned above, was also an example of a very positive report. Since he ended up receiving the prize for good work of the *Société*, it is not very surprising that their report was very positive. They celebrated his attentive work, and added that it was the sign of an experimented chemist, to have worked so well. Report by Lassone fils and Cornette on the Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM.

<sup>569</sup> Report by Bucquet and Coquereau on the Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM. "Ses connoissances chymiques qui sont aussi exactes qu'elles pouvoient être il y a quelques années que pour faire remarquer combien peu de personnes ont le talent de faire de bonnes analyses d'eaux minerales. Néanmoins celles de M. Huet de la Marinière suffit pour éclairer sur les propriétés apéritives et toniques de ces eaux, propriétés confirmées par l'expérience. Nous pensons que ce travail mérite l'approbation de la *Société*."

<sup>570</sup> Report by Lassone fils and Cornette on the Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. "avec soin et exactitude".

<sup>571</sup> Report by Andry and Fourcroy (1782) on the Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM. "Telle est l'idée que nous avons cru devoir donner du travail de m. maret. nous avouons avec bien du plaisir que nous ne connoissons pas

something to say about the alleged lack of importance of the waters he took such care in analysing. The reviewers added that on a few minor points, Maret had deviated from the prevailing method, despite clearly being familiar with it. They added that a comparison of his results with the analysis that Fourcroy had once made of the waters would be greatly beneficial to the progress of chemical analysis. Since Fourcroy was one of the authors of the report, this sounded a little oddly self-congratulatory. The report finished on a very positive note, regarding both the analysis at hand, and the state of chemical analysis in general, which had been “perfected” and had reached a high “degree of confidence”.<sup>572</sup>

These positive reports say a lot about the criteria used by the *Société* when judging chemical work. They clearly valued an attention to detail, they appreciated when the analysts went out of their way to perform precise experiments, and they were not opposed to the inclusion of personal theories and conjectures regarding the science of mineral waters in general. They also showed some leniency regarding the state of the art. The reviewers, despite favouring analyses which followed contemporary methods, forgave analysts who could not have been knowledgeable of the field’s latest advancements.

*Ambivalent sentiments in the negative reports: from compassion to scolding*

The negative reports were just as if not more revealing of the *Société*’s standards, because the reviewer often explained exactly what part of the chemical analysis had been deemed inadequate. In 1777, Lassone fils and Cornette, who were often teamed together to evaluate analyses, noticed an error that Linacier had made in his analysis of the waters of Vallers. They noticed that during the evaporation stage, he had used an iron vessel, instead of using the more customary glass or sandstone container.<sup>573</sup> They explained that iron vessels always contaminated mineral waters, and the results could therefore not be trusted. They explained that Linacier should be prompted to make the entire analysis again using more care and precision. They expressed their hope that Linacier, a known correspondent of the *Société*, might take the feedback gracefully.<sup>574</sup> This highlighted a dynamic that would appear in other reviews.<sup>575</sup> The Associates had to maintain the careful balancing act of keeping

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d'analyse faite avec plus de soin et de sagacité, et qu'il seroit à désirer que des eaux plus importantes que celles de Ste Reine eussent été examinées avec la même exactitude.”

<sup>572</sup> Ibid, “je finirai cette comparaison par faire observer que l'analogie parfaite qui existe entre nos recherches doit prouver combien l'analyse des eaux minérales est perfectionnée et le degré de confiance qu'elle mérite aujourd'hui.”

<sup>573</sup> See chapter 8 on the vessels of evaporation.

<sup>574</sup> Report by Lassone fils and Cornette on the Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

<sup>575</sup> A very similar report was made of the analysis of the waters of Riboulet. Cornette and Bucquet made a point of celebrating the zeal of the physician, but they pointed out similar issues to the previous report, stating that the analysis of the residue lacked precision, and that the air analysis had been left out. This showed the *Société*’s ambiguity when dealing with what it considered to be subpar chemical works. The reviewers had a standard to uphold, but they also

its high standard on scientific works, while not being so harsh as to discourage prospective analysts.

In 1778, the *Société* reviewed two different analyses for the same mineral water. Lanoix and Tissier both analysed the water of Orléanas, a place near Lyon. Coquereau and Bucquet were tasked with evaluating both. They decided that while Tissier's work was more detailed and more precise than Lanoix's, his overall verdict was not as conclusive. They pointed to errors of over-interpretation that had been made by Tissier.<sup>576</sup> This showed that while the *Société* valued precision, it also valued accuracy. This also serves as an important reminder of the connections between chemical analysis and the market. The water of Orléanas were analysed for the sake of obtaining a sales privilege. Under those circumstances, it was the mineral content which mattered the most to the reviewers.

A 1779 report gave a good example of what a truly unsuccessful analysis could look like. The reviewers Coquereau and Cornette pointed out that the numerous problems they found in the analysis of the waters of Monestier. The water had been weighed incorrectly, copper vessels had been used during evaporation, which were as bad as iron vessels. They also pointed out problems with the interpretation of the residue, admittedly one of the most difficult parts of chemical analysis. They explained: "it is likely that here our author has again been mistaken, because what he takes to be epsom salt seems to me is only marine salt with an earthy base which is mixed with a few small crystals of selenite."<sup>577</sup> They went on to point out more experiments that ought to have been performed in order to clear the uncertainty left by the dry analysis. They noted that a critical part of the analysis was missing, as the analyst had not studied the air present in the waters. For these reasons, they strongly recommended that the author do his analysis again.

Sometimes, the reviews only pointed out one aspect of the analysis which needed further work. The analyst of the waters of Pouillon for example had speculated about the possible existence of an oily principle in the waters. Since this went against current chemical theory of mineral waters, the reviewers Bucquet and Coquereau urged him to do more research to support this outlandish conclusion, but saw otherwise few issues with the work.<sup>578</sup> In another

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knew that a negative report could cause issues that the *Société* would ultimately have to resolve down the line. In this case, the correspondence shows that the owner of those waters went on to sell them, despite the negative report of the *Société*. Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM.

<sup>576</sup> Report by Coquereau and Bucquet on the Analysis of the water of Orléanas by Tissier, (1778), SRM 91A, dossier 2, ASRM.

<sup>577</sup> Report by Cornette and Coquereau on the Analysis of the waters of Monestier, (1775), SRM 90A, dossier 19, ASRM. "il est vraisemblable qu'ici notre auteur se sera encore trompé, car ce qu'il prend pour du sel d'epsom ne me paroît être que du sel marin à base terreuse qui étoit mêlé de quelques petits cristaux de sélénite."

<sup>578</sup> Report by Bucquet and Coquereau on the Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

similar example, it was the analysis with the reagents that was missing, prompting the reviewers to request a new attempt.<sup>579</sup>

A problem that reviewers often encountered was a certain discomfort at telling the physicians of small towns that their knowledge of analysis was outdated. They knew that chemistry books were hard to come by in some parts of the kingdom, making accurate analyses difficult to make.<sup>580</sup> In the report on the analysis made by Latronçay, the reviewers expressed: “we admit that it is difficult for physicians distant from the capital, dedicated to their practice, and little initiated in manuals of chemistry to be able to devote themselves to these studies which require the convergence of so much knowledge.”<sup>581</sup> They then voiced their desire to recognise the merit of such physicians, but that in this case, some of the principles which were cited by the author were against “sane chemistry”, and they therefore recommended that the author educate himself a little more on the subject before making a second attempt.<sup>582</sup>

The final report that I want to highlight here came from 1784 and showed a particularly interesting conflict between the interests of the *Société* and those of its individual Associates. Cornette and Fourcroy reported on the analysis of the waters of Sultzbach by Beltz. They stated that the experiments had been performed mostly well, but that the analysis of the residue had to be redone, otherwise it could not receive approbation. They stated that Beltz could expect better results if he “remade the examination of the residue of the evaporation of these waters, by following the processes indicated by m Bergman (1) and in the book by one of us (2).”<sup>583</sup> The note (2), referring to the “one of us”, coincidentally happened to be a detailed reference to Fourcroy’s latest book! The note was spelled out in a precise manner for a manuscript: “(2) Leçon de chymie par m. de fourcroy, Paris 1782, ches Cuchet ruë de hotel serpente. t. 2

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<sup>579</sup> Report by Cornette and Lassone fils on the Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. “il paroît qu’il regarde l’examen par les réactifs comme inutile, ou peu nécessaire ; puis-qu’il ne les a point employés ; quoi-que nous soyons bien convaincus qu’ils sont d’une necessite indispendable dans l’analyse des eaux minérales, servant à diriger les expériences de l’artiste et à lui tracer la route qu’il a à suivre pour acquérir des connoissances sur leur nature.”

<sup>580</sup> In another instance, the reviewers admitted that it was difficult to source “suitable vessels” for air analysis in some parts of the country. Report on the Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. “des recherches de cette nature n’appartiennent à la vérité qu’à un chimiste confirmé et habitant d’une grande ville, car la plupart ne se trouvant pas à portée de se procurer les vaisseaux convenables pour des expériences de ce genre”.

<sup>581</sup> Report by Cornette and Lassone fils on the Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM. “nous avouons qu’il est difficile à des medecins éloignés de la capitale, adonnés à la pratique, et peu initié des manuels de la chimie de pouvoir se livrer a ces études qui exige le concours de tant de connoissances.”

<sup>582</sup> Ibid. Principes contraires à la “saine chimie”.

<sup>583</sup> Report by Fourcroy and Cornette on the Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM. “quoique son mémoire soit en général bien fait, nous croyons que la Société ne peut lui donner son approbation que lorsqu’il aura recommencé l’examen du résidu de l’évaporation de ces eaux, en suivant des procédés indiquées par m Bergman (1) et dans l’ouvrage de l’un de nous (2).”

page 341 à 407.”<sup>584</sup> The reference to Bergman’s book, which was a more universally accepted reference on the matter, was not quite as precisely worded.

To clarify, this was the only example I have been able to find in which a *Société* Associate used his position as reviewer to subtly claim that his own book was a reference on the subject. The reviewers completed their report by expressing great interest at receiving Beltz’s new and improved analysis, and were excited to see what he would do, once he had familiarised himself with “modern knowledge on the analysis of waters.”<sup>585</sup>

The reports, be they positive or negative, were a practical way in which the *Société* could apply its authority and impose its own scientific standards. As the example of Fourcroy shows, this standard was not a just a pure and unmotivated scientific ideal. Rather, it was a construction resulting from the collective ideals and experiences of the Associates which were put in charge of these evaluations. Their opinion was simply greatly magnified by the authority of the *Société* in matters of science.

#### *The Société’s authority in action: resolving the Passy controversy*

When studying mineral waters in the eighteenth century, one spring in particular comes up time and again. It was no famous spa town, instead, it was the new spring discovered in Passy, a small township near Paris. There was much debate as to whether this conveniently placed spring was a genuine mineral water or an abject fabrication, concocted to extort money from Parisian patients. Every person or institute invested with any kind of authority on mineral waters throughout the eighteenth century had to deal with the Passy question. When the *Société* looked at the problem, their conclusions were rather resolute, and its intervention was a demonstration of the *Société’s* scientific authority in a tangible and societally important case.

There had been a mineral water spring in Passy for centuries, but what kickstarted the renewed interest in the locality was the 1719 discovery of a new spring, adjacent to the old one, which appeared to be of a different composition and remedial nature. Since the New waters of Passy, as they would come to be called, sprung on private property, there was much debate as to whether these new waters were a real unique mineral spring, or if they were the result of some trick by the owner, who might have hidden a secret reservoir full of manipulated rainwater behind his property. Strangely, this kickstarted a mystery that was to continue all the way into the end of the century, and

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<sup>584</sup> Ibid.

<sup>585</sup> Ibid, “nous l’invitons avec d’autant plus de plaisir que les eaux de Sultzbach paroissent mériter qu’on s’en occupe avec soin, et que personne ne sera plus en état de le faire que ce médecin lorsqu’il voudra se mettre au courant des connoissances modernes sur l’analyse des eaux.”

study after study on the new waters of Passy seemingly always left a little space for doubt.<sup>586</sup>

Upon the initial discovery, a number of physicians came to Passy to analyse the new waters. They attracted enough attention to catch the interest of the Faculty of Medicine, who sent a small delegation to Passy to appraise the waters.<sup>587</sup> This did not however put a stop to questions, and more analysts travelled to the spring to apply their expertise, for instance Moullin de Marguery who published his analysis in 1723.<sup>588</sup> Others followed suit, and the introduction of their works often referred to the quickly growing body of literature on the subject.<sup>589</sup>

The emulation around the waters was the reason why Venel and Bayen were momentarily pulled from their mission in the south-west to come analyse the Passy waters. The printed analysis which resulted was addressed to Sénac, the First physician, who was the one who had ordered them to come. The results of the analysis were encouraging for the owner. Venel explained that the Passy waters were so concentrated in minerals that they had to be drunk diluted.<sup>590</sup> He compared them to the waters of Spa, which were very popular in Paris. Since the waters of Passy only cost 15<sup>s</sup> a bottle,<sup>591</sup> and the waters of Spa cost 2<sup>l</sup> a bottle, this was excellent marketing for the New waters of Passy.<sup>592</sup>

Despite the New waters being analysed by the most official analyst of the time, the scientific curiosity did not die down after the publishing of Venel's work. In the following years, two apothecaries would try their skills at it. Cadet, who published his analysis in 1757, was particularly interested in the myth that the Passy water contained copper, a known toxic substance. The purpose of his work was to discuss this possibility, and demonstrate its absence.<sup>593</sup> Machy, the other apothecary, centred his analysis on a comparative work with the nearby source that sprung in the property of Ms Belami. He concluded that

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<sup>586</sup> It is not clear from the archival records or literature on the subject, why this mystery endured for so long. I am not familiar with other cases in which a new spring was strongly suspected to have been fake for such an extended period of time.

<sup>587</sup> J. A. Dulaure, "Nouvelle description des environs de Paris: Contenant les détails historiques et descriptifs de Maisons Royales des Villes, Bourgs," (Chez Lejay, Libraire, rue NEuve des Petits Champs, près celle de Richelieum au Grand Corneille, 1787), 181.

<sup>588</sup> Moullin de Marguery, "Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris," (A Paris, chez François Barois, ruë de la Harpe, vis-à-vis le College de Harcour, à la Ville de Nevers, 1723).

<sup>589</sup> Cantwell, "Analyse des nouvelles eaux de Passy," 1.

<sup>590</sup> Venel and Bayen, "Analyses chimiques des nouvelles eaux minérales de Passy," vi.

<sup>591</sup> Their price decreased later on to reach only 6<sup>s</sup> a bottle. Poster on the prices of waters in Paris, (not dated, likely ca. 1778), SRM 95, dossier 1, ASRM.

<sup>592</sup> See chapter 2.

<sup>593</sup> Cadet, "Analyse Chimique," in *Analyses chimiques des nouvelles eaux minérales, vitrioliques, ferrugineuses, découvertes a Passy dans la maison de madame de Calsabigi. Avec les propriétés medicinales de ces mêmes eaux, fondées sur les observations des médecins & chirurgiens des plus célèbres, dont on rapporte les certificats authentiques*, ed. Gabriel François Venel and Pierre Bayen (1757), 64.

both the waters of Passy and the waters of Ms Belami were very suitable to cure many diseases.<sup>594</sup>

Somehow, despite all these positive accounts made between 1720 and ca. 1765, the mystery lingered. Some people reportedly still believed that the waters were not real, natural waters, but the result of some fabrication by the Calsabigi family who owned the spring. It then fell to the *Société* to once again attempt to clear the mystery. Vicq d'Azyr was contacted by a minister, and asked to send a delegation to Passy, not to analyse the waters but to specifically investigate whether the theory of them being fake had any weight at all.<sup>595</sup> The commissaries were selected amongst *Société* Associates, and they went to Passy to investigate. They thoroughly checked the surroundings, emptied the basin in which the waters fell, and were finally convinced that there could be no artifice at play there, and that both the old and the new waters of Passy were true mineral waters which deserved the trust of the public.<sup>596</sup>

This was not the definitive end of the controversy, but it certainly appears to have lessened the reach of Passy detractors, who subsequently were punished harshly for spreading falsities and libel about the new waters.<sup>597</sup> This suggests that the *Société's* authority prevailed, where others previously failed.

## Legacy of the *Société's* work at the revolutionary *École de Santé* (1793–1810)

From the late seventeenth-century attempt at distilling the waters of France, to Venel's mission, to the *Société's* support for chemistry, the importance of chemical analysis in the scientific knowledge on mineral waters was grounded in a long tradition. As time passed, it also became clear that chemical analysis was not only a tool of science, but also a tool of administration. A good analysis could serve as the ticket of entry onto the market of waters. A mineral water which had been analysed by a reputable chemist had the potential to become a commodity, and become part of the market. And although this was partially true in Venel's time, analysis was officially and legally required in the time of the *Société*. It is therefore of interest here to study, albeit briefly, whether or not government attempts to use analysis to control mineral waters

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<sup>594</sup> Machy, "Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.", 43.

<sup>595</sup> Note from Cadet to Mignon, SRM 91A, dossier 5, pièce 23, ASRM.

<sup>596</sup> Analysis of the waters of Passy by Vicq d'Azyr and eight commissaries of the *Société*, (1784), SRM 91A, dossier 5, ASRM.

<sup>597</sup> See for example the case of Croharé who claimed the waters were false in a pamphlet, only to be later found guilty of libel. Le Veillard, "Mémoire à consulter pour les Sieur & Dame le Veillard, propriétaires des nouvelles eaux minérales de Passy. Contre le Sieur Croharé, apothicaire de Monseigneur le Comte d'Artois," (Impr. de Monsieur, 1786).

were only a product of the *Ancien Régime*, or if the association between state, market and chemistry lasted beyond the revolution.

In 1794 (or year [An] III of the republican calendar),<sup>598</sup> the medical education system was reorganised into three *Écoles de Santé*, or Health Schools, located in Paris, Montpellier and Strasbourg.<sup>599</sup> These schools taught both medicine and surgery, and their foundation was in part spearheaded by no other than former *Société* Associate Fourcroy.<sup>600</sup> These schools underwent a number of changes, but notably, most questions related to mineral waters were relayed to members of the *École de Santé* (*École* for short) of Paris.<sup>601</sup>

In a letter from the An VI (1797–1798) to the minister, written by administrators of the Deux-Sèvres region, familiar complaints regarding the poor exploitation of a local water were made. The administrators explained that because of the natural carelessness of the people of the region, their precious spring was under-utilised. They stated: “We believe we can usefully serve the public cause by giving to some chemists or distinguished physicians, the task of visiting the spring, of analysing its waters, of indicating its value and of giving a preview on the means of creating a useful establishment there.”<sup>602</sup> A few years after its creation, and after receiving a few similar requests, the *École* wrote legislation regarding the administration of mineral waters under the new revolutionary administration.

The *École de santé* of Paris will be authorised by the Minister, to recognise with care, and according to the new lights acquired in chemistry, the nature

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<sup>598</sup> The French Republican calendar was the official calendar used in France between 1793 and 1805. It was meant to commemorate a new era of French history, and it designated the 22<sup>nd</sup> of September 1792 as the first day of Year I (called An I). Since the Republican year started in September and not in January, conversions from revolutionary to classic calendar always indicate two dates, i.e.: the An III, meaning Year three, corresponded to the late 1794 and the beginning of 1795. Most secondary literature on the French Revolution uses this calendar when speaking of the period, hence why I will be giving double dates in the following section and in all subsequent passages discussing the revolutionary period.

<sup>599</sup> *Écoles de médecine de Paris*, dossier 20, *Projet d'installation des écoles de médecine de Paris sur la place Sainte-Geneviève*, F/17/1065/A, AN. On this, see: Maurice Crosland, “The Officers de Santé of the French Revolution: A Case Study in the Changing Language of Medicine,” *Med Hist.* 48, no. 2 (2004).

<sup>600</sup> Antoine François de Fourcroy, “Rapport et projet de décret de Fourcroy, au nom des comités de Salut public et d'Instruction publique, pour établir à Paris une École centrale de santé, lors de la séance du 7 frimaire an III (27 novembre 1794),” *Première série (1787–1799)* (CNRS éditions, *Archives Parlementaires de 1787 à 1860*, 2012).

<sup>601</sup> On medicine during the revolution, see: Roselyne Rey, “L'École de santé de Paris sous la Révolution : transformations et innovations,” *Histoire de l'éducation* 57 (1993).

<sup>602</sup> Correspondence from the administrator of the Deux Sèvres to the minister of the interior, (An VI), AJ/16/6697, AN. “Nous croyons utilement servir la chose publique en donnant à quelques chimistes ou médecins distingués, la commission de visiter la source, d'en analyser ses eaux, d'en indiquer la valeur et de donner un aperçu sur les moyens d'y créer un établissement utile.”

and virtues of the different mineral waters, and to remake their analysis, and to classify them according to their properties.<sup>603</sup>

This new legislation decided that the examination of mineral waters was from then on going to be the responsibility of the *École de Santé* of Paris.<sup>604</sup> According to this legislation, chemistry was the ultimate arbiter on the question of waters. Chemists were asked to regularly check on the springs, so as to keep knowledge of each spring up to date. The persistence of the link between chemistry and administration could hardly be clearer.

The *École* made use of expert chemists in ways that demonstrate continuity with previous tendencies. For a start, the *École* took a page out of the *Société's* book and attempted to mobilise the network of physicians in the entire Republic in order to obtain knowledge about the local use of remedies.<sup>605</sup> Similarly, the *École* sometimes asked its contacts to go perform the analysis of new waters. When a thermal spring was discovered in Bagnères-de-Luchon, the *École* suggested to give the task of analysis to the Montpellier *École*, since they were closer to the spring than Paris.<sup>606</sup>

The *École* also insisted on the importance of analysis as an essential precursor to the sale of a water, stating “there is much recklessness in authorising the sale of a mineral water of which the virtues are not recognised in a legal manner.”<sup>607</sup> But as many before them, the *École* recognised that analysis was difficult, especially in the face of many “particular interests”, and “prejudices”, but that nevertheless, it was an important precaution to “be ensured of their nature and of their composition.”<sup>608</sup>

Another habit which was kept was the of choosing inspectors and intendants based on their knowledge of chemistry, and in particular, their knowledge

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<sup>603</sup> Administration des eaux minérales en période révolutionnaire, (An VII), dossier 332, 2, BIU. “l'École de santé de Paris sera autorisée par le Ministre, à reconnaître avec soin, et d'après les nouvelles lumières acquises en chimie, la nature et les vertus des différentes eaux minérales, d'en recommencer l'analyse, et de les classer d'après leurs propriétés.”

<sup>604</sup> Rapport sur une lettre du Ministre de l'Intérieur, (5 messidor an X), AJ/16/6697, AN.

<sup>605</sup> See for example a letter from the prefect of the Seine *département*, asking for information about the recent spread of disease, and asking which kinds of remedies had been used to combat the epidemics. Correspondence from the prefect of the Seine *département* to physicians, (An X), AJ/16/6697, AN.

<sup>606</sup> Rapport sur une lettre du Ministre de l'Intérieur sur la question de savoir par qui doit être faite l'analyse d'une eau thermale, nouvellement découverte à Bagnères de Luchon, (5 messidor an X), AJ/16/6697, AN.

<sup>607</sup> Rapport sur différens mémoires relatifs aux eaux minérales, (An X), AJ/16/6698, AN. “il y a beaucoup d'inconscience a permettre la vente d'une eau minérale dont les vertus ne sont pas constatées d'une maniere legale.”

<sup>608</sup> Ibid, “pas exempt de difficultés. En effet pour arriver au but qu'on se propose d'atteindre, il faudrait supposer la réunion de plusieurs personnes éclairées qui toutes occupées entièrement de l'objet dont il s'agit, eussent le courage de braver les intérêts particuliers, sussent se mettre à l'abri des préjugés, cherchassent à vérifier jusqu'a quel point les observations qui ont été citées sont exactes et prévissent les cas généraux et particuliers ou les eaux minérales peuvent être prescrites et prissent enfin toutes les precaution possibles pour s'assurer de leur nature et de leur composition.”

of water analysis. The application documents showed a very similar tendency of boasting about one's knowledge in the domain, as an argument for the qualifications of the candidate.<sup>609</sup>

Perhaps the most telling continuity was seen in the power held by the *École* in the evaluation of chemical analyses. Just as the *Société* once did, the *École* charged one of its members, often the pharmacist and chemist Nicolas Deyeux (1745–1837), to read and write reports on the chemical analyses that he received. Those analyses were not typically sent to the *École* directly, as it did not have a network and a correspondence network like the *Société* once had. Rather, it received analyses to evaluate from the ministers, and it reported back to the government.

*The École's reviews of chemical analyses: the persistence of ambivalent sentiments*

When reviewing the analyses that were sent its way, the *École* had to judge the quality of the experiments performed, the credibility of the author's claims, and the knowledge of chemistry that was displayed. Those appraisals ended either in a recommendation for approval or in an order to make a new analysis.

A positive report from 1802 suggested that although a newly discovered water was noteworthy from a medical point of view, its location close to the already well-known waters of Aix made it unlikely to succeed commercially. The report stated that however, if the owner felt like making the necessary spending to make his spring accessible to the public, he was very welcome to do so.<sup>610</sup> A very similar conclusion was reached concerning the waters of Samblacay, with the reporter stating that although the analysis was not perfect, it was good enough to be passable, and that he saw no issue with these waters being used by the public.<sup>611</sup>

One report had been sent as part of an application for a position of inspector. Deyeux concluded that the memoir was well-made, and that it adequately demonstrated the applicant's skills. He therefore extended his recommendation for his attribution of the position of inspector.<sup>612</sup> He even added that the patients who visited those waters would be lucky to meet an inspector with such good knowledge of not only the waters, but also the best ways of taking them.<sup>613</sup>

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<sup>609</sup> Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN.

<sup>610</sup> Report by Deyeux, Roux and Vauquelin on the analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN.

<sup>611</sup> Remèdes secrets, eaux minérales, Rapport sur les eaux de Samblacay, (An XII), AJ/16/6698, AN.

<sup>612</sup> Report on the application for the position of inspector at the waters of Lamalou, (1806), AJ/16/930/A. n°519, AN.

<sup>613</sup> The same happened a few years later, and once again, the excellence of the work was deemed to merit the position of physician inspector. Report by Deyeux, (1810), AJ/16/6697, n°822, AN.

In the year III (1794–1795), a somewhat similar situation to the Passy question was resolved by using the expertise of the *École*. Some “noise” spread by “malevolent” individuals were said to have tarnished the reputation of the waters of Usat, suggesting that they had been mixed with other springs and had therefore been diluted beyond saving.<sup>614</sup> Two commissaries were appointed in order to investigate the matter. According to their chemical analysis of the source, the waters were just as good as they had always been. The report expressed a hope to see the rumours cease following this evidence.

In the positive reports, the reviewers congratulated similar qualities. For the waters of Cambon, the reporter celebrated the “care” that had been put in the analysis.<sup>615</sup> The waters of Combo were said to have been properly analysed by Pommier, a chemist who showed that he was “very aware of current knowledge”.<sup>616</sup> The reviewer added that he wished all waters were analysed in this fashion.<sup>617</sup> The *École* appears to have valued precision, the inclusion of all necessary steps, and the enthusiasm of analysts who wanted to promote their local waters.

In other cases, the *École* was not quite as impressed with the chemical analyses that it received. In the An IX (1800–1801), it received the analysis of the waters of Bourg, and judged that it was “too incomplete for us to definitively decide on the properties of this Water. The author of the analysis has made many useless experiments and has omitted those that are the most essential.”<sup>618</sup> The report pointed out some specific problems with the missing experiments, explaining for example that the acre taste of the waters was ill explained by the results of the analysis.<sup>619</sup>

In another case, the *École* received an application for a position of inspector, in which the applicant claimed that the water he was interested in supervising had been analysed by the renowned chemist Jacquet, and that this

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<sup>614</sup> Report on the baths of Usat, (ca. 1808), AJ/16/6697, 861, AN. “Les travaux qui ont été faits, d'après cette vüe, ont donné lieu à des malveillants de répandre le bruit qu'on avoit détériorié l'eau de la premiere source, en la mêlant a d'autres eaux qui lui etoient etangeres.”

<sup>615</sup> Eaux minérales de Cambon, (1806), AJ/16/930/A, 481, AN. “l'analyse de Mr le Bout parroit avoir été faite avec soin, et il résulte de son travail que l'eau ferrugineuse tient en dissolution des muriates calcaire, de magnésie et de fer, des muriate et carbonate de soude et du sulfate calcaire”.

<sup>616</sup> Report by Pommier on the waters of Combo, (1809), AJ/16/6697, 780, AN. “tres au courant des connoissances actuelles”.

<sup>617</sup> The same was said of another analysis received in 1811, with a suggestion to send this particular analysis for publication. Report by Deyeux on the analysis of the waters of Usat, (1811), AJ/16/6697, 862, AN. Another report also celebrated the quality of the chemical work that had been done on the waters of Aix la Chapelle, particularly commanding the air analysis. Report by Deyeux on the analysis of the waters of Aix la Chapelle, (1811), AJ/16/6697, 866, AN.

<sup>618</sup> Report by Deyeux on the analysis of the waters of Bourg, (An IX), AJ/16/ 6698, AN. “L'analyse de l'eau de Bourg qui a été envoyée à l'Ecole, est trop incomplete pour qu'on puisse prononcer definitivement sur les propriétés de cette Eau. L'auteur de l'analyse a fait beaucoup d'expériences inutiles et a omis celles qui etoient le plus essentielles.”

<sup>619</sup> Ibid, “quant à la saveur acre que dit avoir trouvée à l'eau de Bourg ou n'entend par d'ou elle pourroit venir à moins de supposer la présence d'une assez grande quantité de muriate calcaire”.

should be sufficient to authorise their sale to the public. The *École* explained that the reputation of the chemist alone was no sufficient evidence to certify the properties of the waters, and that they would need to see a copy of the analysis before granting the applicant his wish.<sup>620</sup>

The arguably worst possible review was given to the analysis of the waters of Saltz en Donzy, sent in the An XI (1802–1803). Deyeux said that the analysis was so bad and so incomplete that he wondered if the citizen Poncet who had made it had ever seen a chemical analysis of a mineral water before.<sup>621</sup> The citizen in question was informed of the shortcomings of his first work, and subsequently sent a second analysis, which Deyeux deemed to be just as bad as the first, as “no reasonable consequence” could be drawn from this second attempt.<sup>622</sup>

In the same vein at the *Société*, the *École* also had some concern for the reactions to its reports. In 1806, an analysis of the waters of Capbern came to the *École*. It judged that the analytical part of the memoir had been rushed, stating that the author “does not know the necessity of doing it with more exactitude. According to the few experiments that he cited, it seems that the mineral Waters of Capbern are of the kind of those which contain mostly carbonic acid gas in excess and iron carbonate.”<sup>623</sup> However, despite this rather negative appraisal, the reviewer mentioned that the author had still done a lot

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<sup>620</sup> Rapport sur l'avis du C Desmaisons de faire insérer dans le journal officiel les qualités supérieures des Eaux d'Aix en Savoye, (An XI), AJ/16/6698, AN.

<sup>621</sup> Rapport sur une lettre du ministre de l'intérieur relative aux Eaux minérales de Saltz en Douzi, (An XI), AJ/16/930/A, n°273, AN. “Le ministre avant de prendre un parti à cet égard, doit consulter l'école qui répondit que pour prononcer il falloit qu'on connut qu'elle étoit la nature et la quantité des substances tenues en dissolution dans l'eau dont il s'agit; que l'analyse que le citoyen Poncet envoie étoit insuffisante, elle ne pouvoit servir à déterminer un jugement positif”. This seems to be a bit of a theme, in the negative reports which often stated regret regarding the lack of chemical knowledge of the author of the analysis. In the report on the waters of Nievstin, the *École* stated that a better analysis had to be made by chemists “in a state to follow with Exactitude the works which the examination of a Mineral water requires.” Analysis of the waters of Nievstin by the Société des Sciences of Mont Tonnerre, (1803), AJ/16/6698, AN. “elle [l'École] croit devoir suspendre son avis, jusqu'à ce qu'une analyse plus exacte que celle qui lui a été donnée en communication, ait été faite par des Chimistes en état de suivre avec exactitude les travaux qu'Exige l'examen d'une eau Minerale, lorsqu'il s'agit de Prononcer sur la nature des différentes substances qu'Elle tient en Dissolution, ainsi que sur ses propriétés Médicinales./.”

<sup>622</sup> Ibid. Envoi d'un mémoire “tout aussi insignifiant que le premier”. “sans répondre à la démarche qui lui étoit faite de produire une analyse exacte, il s'est contenté de donner un aperçu des substances qui suppose que contient l'eau minerale dont il eut établi la réputation; mais comme cet aperçu est même si peu conforme à ce qu'on peut présumer exister réellement il en résulte qu'on ne peut en tirer aucune conséquence raisonnable.”

<sup>623</sup> Eaux minérales de Capbern, (13th March 1806), AJ/16/930/A, AN. “cette notice m'a paru bien faite, excepté cependant la partie qui concerne l'analyse chimique des Eaux de Capbern. à la moitié? l'auteur annonce qu'il n'a pas eu le temps de soigner cette analyse; et qu'il ne connoit la nécessité de la faire avec plus d'exactitude. D'après le peu d'expériences qu'il a citées, il parroit que les Eaux minérales de Capbern sont de l'espece de celles qui contiennent essentiellement du gaz acide carbonique en excès et du carbonate de fer.”

of work, and even conceded that the waters were very likely to have useful properties.<sup>624</sup>

This attention to the analyst's pride was not always displayed however.<sup>625</sup> And in response, their authors sometimes reacted to the bad review.<sup>626</sup> Those exchange could be quite civil. The *École* reviewed for example a memoir on the waters of Saint Laurent les Bains, which was reportedly very enthusiastic, to the point of being a little whimsical in its description of the waters. The report mentioned, perhaps playfully, that "If so many marvellous properties belong, as the author affirms, to the Waters of St Laurent, we should regard these Waters like a sort of universal remedy which alone could suffice to heal almost all diseases to which the human Species is all too unfortunately exposed."<sup>627</sup> The report added however, that while Furet, the author, might have let his imagination run a little wild, his efforts should still warrant encouragement. Furet responded to the Deyeux's report, and to that response, Deyeux stressed that, while the first memoir was indeed exaggerated, the *École* had never doubted the properties of the Saint Laurent waters, and they applauded the renewed efforts of Furet in sending a second memoir. This second attempt, while still containing some errors, also included interesting findings, which confirmed the legitimacy of Furet in his newly appointed position as inspector.

This example showcases a phenomenon that was commonplace since the early days of the mineral water market. When faced with good faith but scientifically dubious actors, the authorities did not always judge their works harshly. They accepted that mineral waters analysis was, all things considered, still a somewhat 'soft' science, and the strict chemical standard should not be in place to bar good medical practitioners from assisting patients at the springs.

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<sup>624</sup> Ibid, "ces eaux, il n'en faut pas douter, doivent avoir des propriétés bien prononcées, aussi et c'est d'après cela que je propose à l'École d'inviter son excellence le ministre de l'intérieur, à témoigner sa satisfaction à mon s La Crampe Loustau de la peine qu'il a prise pour faire le travail qu'il a présenté."

<sup>625</sup> In one case, the reviewer brutally commented that the waters would be better suited to the making of dyes than the preservation of health. Second rapport sur les Eaux ferrugineuses de Labro, département de l'aveyron, (1806), AJ/16/930/A, 492, AN. "En consequence de cette reponse, le ministre fit demander de nouveaux renseignements au Préfet de l'aveiron sur l'eau dont il sagit. Ces renseignements ont été fournis et par le mémoire qui les contient, j'ai vu qu'il ses bien prononcé que les Experiences citées par Mr Ribeaucourt ne sont pas exactes, et que d'après l'avis de Mr Bertholet, l'eau de Labro est plus propre aux teintures en nois, qu'à réparer la santé."

<sup>626</sup> Rapport sur une lettre de M Chancel sur son analyse des eaux du Monestier, (1809), AJ/16/6697, 753, AN. "rien n'est plus difficile que de faire une analyse d'eau minerale avec cette exactitude rigoureuse qu'on exige toujours lorsqu'il sagit de corps moins composés. c'est aussi pour cela qu'on a si peu de bonnes analyses d'eaux minerales".

<sup>627</sup> Rapport sur un mémoire de monsieur Furet sur les eaux thermales de Saint Laurent les Bains en Ardèche, (1809), AJ/16/6697, 772, AN. "Si tant de propriétés merveilleuses appartiennent, comme l'affirme l'auteur, aux Eaux de St Laurent, il foudroit regarder ces Eaux comme un sorte de remede universel qui seul devoit suffire pour guerir presque toutes les maladies aux quelles l'Espece humaine n'est malheureusement que trop exposée".

## Conclusion

This chapter presents the mechanisms through which chemistry was implemented as a crucial field of knowledge within the realm of mineral waters. Because this process was slow, I chose to study it over a relatively long time period, starting the empirical investigation in 1753 and extending it into the early nineteenth century. While the *Société's* emphasis on chemistry was influential, its efforts were much more significant when shown as part of more than half a century of continuity.

The recontextualised account of Venel's mission unambiguously shows that chemical analysis was an established method of gaining knowledge about mineral waters by the middle of the eighteenth century. Venel's story also highlights the various challenges associated with any large-scale survey of the French mineral waters. The ultimate failure of his mission made it clear that this was not a task that could be undertaken by a single individual, or by a pair of analysts as it were. At the same time, the anticipation that many analysts voiced regarding Venel's never-to-materialise results also demonstrates the demand that existed for such a systematic study.

This context is an important background in understanding the *Commission* and the *Société's* attitudes towards chemistry in general, and chemical analysis precisely. Both medical institutions included chemistry as part of their activities. When it came to the gathering of information from different French springs however, neither institution ever sent their own specialists for another ambitious fact-finding mission. The *Société* instead learned from past failures and decided to rely on its network.

The network of correspondents of the *Société*, its "communication of lights", lived up to expectations. They were responsive, and even willing to do further experiments when prompted. The *Société* encouraged this behaviour by leveraging its own prestige, for example by handing out prizes to deserving correspondents. This meant that throughout its short existence, the *Société* was able to gather an unprecedented amount of data regarding the chemical state of French waters.

The *Société* also needed to evaluate the quality of the data it received. This can be studied in a few different ways, but the most telling kind of document that I have found in that regard were the reviews that its expert chemists made of the analyses it received. These documents show in practice what kind of chemistry was considered worthy of praise, in the opinion of the Associates. The *Société's* ideal analyst was dedicated, precise, well-read, aware of recent developments in the field, and careful in his choice of theories, vessels and reagents. The reviewers also allowed analysts to make new scientific claims in their reports, as long as they were supported by credible evidence.

Given the institutional power of the *Société*, the chemical standard they imposed on the market of mineral waters was firmly implemented, and the actors who worked with the mineral water market appear to have integrated the importance of chemistry. As a testimony to the endurance of this

association between chemical analysis and mineral waters, it lasted even after the *Société's* revolutionary demise. The institute which immediately succeeded it, the *École*, applied a comparable set of standards and expectations, despite the drastic change in governance. Overall, the *Société* was successful in reaffirming chemistry as the expert science in the field of mineral waters.

## Chapter 5. Decentred waters

The ambition of regulators was to create an institution with enough resources, knowledge, authority, and persuasion skills to overcome fraud, and bring about a reliable, and profitable mineral water market. The work of the First physician, followed by the *Commission* and the *Société*, all embodied this ideal. And while giving the First physician Letters patent and demanding he fix the issues of the trade, and creating an entire institution from scratch were two very different endeavours, they operated from the same fundamental notion of centralisation. One strong entity, located in Paris, should, using the power of scientific authority and legislation, be able to rule the market of mineral waters kingdom wide.

This vision of power was by no means limited to the market of mineral waters, it was a general emanation of the *Ancien Régime*, a way of idealising centralisation as the proper way of bringing about lasting order. This model was however at odds with the reality of mineral waters. In this chapter, I will explore the ways in which the regulators' ideals of centralisation failed to materialise. The social reality of the market, the intricacy of the pre-existing networks, the number of convoluted regional legislations, and the physicality of the waters themselves all compounded in inhibiting centralisation.

A speaker at the *Commission* put this into words, in his 1776 address to the members. He recounted: "I have had the honour Sirs to talk to you in different sessions of the Com[mission] R[o]ya[le] about the frauds that are committed in almost all provinces of the kingdom in the distribution of mineral waters. it even seems that the lawlessness introduces itself more and more in the furthest provinces."<sup>628</sup> This plea highlights a very practical issue that arose from the regulators' physical location in Paris. The further the bureaus and spa towns were, the less the *Commission* was able to curb the spread of illegal activity. Physical distance was no small feat to overcome. And with no strong judiciary power to speak of – neither the *Commission* nor the *Société* had its own police force – the institutions in charge of the market often had to resort to shaky diplomacy, time-consuming attempts at conflict resolution, and sometimes forced leniency in the face of unsolvable problems.

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<sup>628</sup> Minutes of the meetings of the *Commission*, 76e et 77e assemblées, (3<sup>rd</sup> June 1776), SRM 112 dossier 5, ASRM. "J'ai eu l'honneur messieurs de vous entretenir en différentes séances de la Com Rle des fraudes qui se commettent dans presque toutes les provinces du royaume dans la distribution des eaux minérales. il paroît même que la licence s'introduit de plus en plus dans les provinces éloignées."

Controlling the market of mineral waters was a task akin to the management of any other natural resource, albeit on a smaller scale. Their inherent dispersion created challenges when it came to control. Despite the arsenal of workers that were deployed around mineral waters, from transporters to intendants to inspectors to sub-committees, nothing could sidestep the reality that the waters could never be in arm's reach of the king at all times. The social and relational issues between the actors of the market were compounded by geography or simple geological phenomena.

The attempt at centralisation stemmed from the monarchy itself. The only authority that the First physician of the king, the Commission Royale, or the Société Royale ever held rested with the power granted to them by the monarch. When the monarchy fell following the events of 1789, the power structure that held the regulation of mineral waters collapsed. This presented an opportunity for lawmakers to invent new systems of regulation. Some were characterised by a strong continuity with the late *Société's* rule, but the ideal of a full central authority was more or less relinquished.

This chapter's primary aim is to bring the concept of decentredness to life. While I will be arguing that the market of waters overall evaded the centralised power of regulation, this concept would be abstract without examples or nuance in its application. The legislation was not wholly without impact. The first chapter made it clear that prices were directly affected by the increased scrutiny of the *Société*. The rules simply failed to meet the ambition of the regulators, forcing them to argue and compromise in many areas. In order to bring the required precision, and at times, human colour to this concept, I will be highlighting a number of examples of compromise and describing the exchanges between regulators and market actors.

This chapter will once again follow a loose chronology, starting from the early days of the *Commission*, and ending after the downfall of the *Société*, in the revolutionary period. I will start by pointing to the scattered materiality of mineral springs, and the challenges that this presented. I will then discuss the ways in which regulators attempted to manage the conflicts they encountered. The study will then turn to the reasons underpinning the various conflicts between regulators and actors in the market, namely regional laws, geography, lack of communication, and the impracticability of certain rules. I will conclude this chapter by describing the revolutionary end of the *Société*, and the legacy of its centralised legislation.

## The decentred materiality of the waters

Centralising the market of mineral waters was a difficult task largely because of social and relational reasons. The conflicts were typically caused by people rather than circumstances. Despite this, the physicality of the waters themselves should not be dismissed out of hand. There were some inherent

difficulties to the regulation of mineral waters that were completely unrelated to the lack of cooperation of disgruntled bureau tenants.

In most spa towns, the mineral spring itself was not a completely settled object. Even when it was forced into pipes and fountains, the water could dry up, or it could start to flow elsewhere. Waters moved with the landscape. In Bagnères, in the face of high demand, the locals dug a large number of baths in the earth, which in turn had the unforeseen consequence of drying up older ones.<sup>629</sup> Some springs had too small of a flow in order to accommodate the people who wanted to drink them. In one case, the owner of a spring had to consider deviating its course, because the water was not flowing properly, and causing the formation of a bog on his land. This in turn caused relational issues with his neighbour. So while the water on his property appeared promising for its remedial qualities, it ended up causing more trouble than anticipated.<sup>630</sup>

When a spring had too small a debit, the locals sometimes attempted to prospect and dig in various points in the vicinity of the spring, hoping for a second point of overflow. This could raise issues regarding ownership. For instance, the owner of the waters of Orliénas asked the *Société* to forbid anyone within a mile of his domain to dig with the intent of finding a secondary spring.<sup>631</sup> The owner in question had just gone through great lengths to have his waters analysed by a series of physicians, and did not intend on having any competition after these expenses. But the mineral waters themselves did not care much for borders and private property.

A recurring issue mentioned by intendants and mineral water inspectors concerned the mixing of mineral springs with so-called foreign waters, meaning common water which could merge with the mineral spring and thus dilute its content, altering its remedial qualities. The flow of any stream can be unpredictable and subject to variations due to weather and other geological conditions, meaning that an unusual amount of rain or melted snow could create a disruption in the path of the mineral spring. A letter describing the state of the waters of Pouillon explained for instance that the spring was isolated, and thus vulnerable to foreign waters.<sup>632</sup> Because of this risk, checking the fountain for any signs of contamination by foreign waters was a part of the intendant's prerogatives.<sup>633</sup> Any intervention on the course of the spring, for example an attempted repair on a damaged fountain, came with the risk of causing

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<sup>629</sup> Rapports sur les dégradations de certains établissements de bains, 100e assemblée, (5<sup>th</sup> January 1778), SRM 113, dossier 10, ASRM.

<sup>630</sup> Correspondence from Bertrand-Lagrésie to the *Société*, (1779), SRM 91 A, dossier 7, ASRM.

<sup>631</sup> Correspondence to the *Société*, (1779), 743 Wp 065, AML.

<sup>632</sup> Correspondence from Massie to Raulin, 76e et 77e assemblées, (3<sup>rd</sup> June 1776), SRM 112, dossier 5, ASRM.

<sup>633</sup> "Projet d'un règlement pour les eaux minérales du Royaume", 89e assemblée, (24<sup>th</sup> March 1777), SRM 112, dossier 17, ASRM.

changes in the water's composition by introducing foreign waters.<sup>634</sup> If contamination was suspected, it could sometimes be difficult for physicians to prove to the public that the water was still remedial.<sup>635</sup>

In addition, although by the late eighteenth century, confidence in chemistry had grown enough for most people to take the word of chemical analysis as being proof regarding the minerality of a spring, some waters still escaped strict definitions. I will not talk here about the issues that arose when no scientific consensus on the mineralogy of a spring could be reached, although that certainly happened from time to time.<sup>636</sup> But there were also rarer cases of waters which were not quite mineral, but not quite common waters either. This put them in an odd legal status.

One example of this were the waters of Salies, in the Béarn, a small region in the south-west of France.<sup>637</sup> This commune had a natural spring of highly salty water, which had been discovered somewhere in the late antiquity, or so the inhabitants claimed. Since 1587, the spring had been regulated in a partnership which was drawn directly between the inhabitants of this small village and the king. In this partnership, it was established that one spring would be owned by the monarch, and the other by the inhabitants.<sup>638</sup> The revenue made from the latter spring would be evenly split between all married couples who populated the village, in exchange for which all worked an equal amount of time at the extraction of salt from the spring.<sup>639</sup> This arrangement was notable for many reasons, but for the current purposes, it must be noted that the waters of Salies were never officially counted among mineral waters, despite closely resembling them. Their content in salt was surely high enough, but they were never drunk nor were they celebrated for their therapeutic uses. In consequence, the waters of Salies were not placed under the administration of the

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<sup>634</sup> In one case, the intendant mentioned being especially careful when renovating the fountain, so as to make sure that the reconstruction did not make things worse by deviating the course of the spring and diluting it with foreign waters. Correspondence to the *Commission*, on the waters of Bilasay, 64<sup>e</sup> assemblée (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM. "je prends soin, m. m., que ces travaux ne donnent pas lieu au mélange d'eaux étrangères avec celles des sources minérales".

<sup>635</sup> See for example how Marguery argues for the virtues of the Passy waters in: Marguery, "Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris."

<sup>636</sup> This is discussed more thoroughly in chapter 7.

<sup>637</sup> See documents on Salies and its issues during the eighteenth century in: États de Béarn (affaires d'ordre intérieur) ; eaux et forêts, H//86, AN.

<sup>638</sup> The two fountains in Salies produced an estimated 24,000<sup>l</sup> a year. For a breakdown of the profits between the king and the inhabitants, see: Letter in Auch, États de Béarn (affaires d'ordre intérieur) ; eaux et forêts, (16<sup>th</sup> July 1783), H//86, AN.

<sup>639</sup> The reason for this equal distribution of the profits was justified on the basis of fairness, stating that it would be unjust that some work while others simply amassed the fruit of their labour. États de Béarn (affaires d'ordre intérieur) ; eaux et forêts, H//86, AN. "les motifs de ce reglement s'offrent d'eux mêmes la nature ayant accordé cette source de richesse a ces habitans, le travail, l'industrie et la residence habituelle devant la rendre plus ou moins feconde, il n'etoit pas juste que les uns travaillassent et sacrifiassent leurs tems et leurs goûts pour faire jouir les autres du fruit de leurs travaux et de leurs sacrifices."

*Société*, or the First physician.<sup>640</sup> All of their issues were resolved in correspondence with ministers directly, and it was also stated that the spring of Salies was independent from the administration of the Ferme Générale, or general tax office.<sup>641</sup> This case shows that the tacit definition of a mineral water necessarily included medical effects, but not market value. The waters of Salies brought a real revenue to the town, but because the locals rarely, if ever, attempted to bathe in them, their administration remained separate from that of mineral waters.

Another other case ambiguous boundary was the debate around artificial waters. I will later touch on the chemical advances and changes of opinions that led to renewed interest in these alternatives to natural waters.<sup>642</sup> But even without this context, the fact remained that by the end of the eighteenth century, some establishments made a living by making and selling artificial waters to be used in similar ways to traditional natural waters. A project was drawn in the An IX (1800–1801) for example, to create such an establishment in Lyon. The proposed establishment included baths and showers, so that clients could receive the same treatments than they would if they travelled to Vichy.<sup>643</sup>

More establishments of this kind would be proposed in the first decade of the nineteenth century. But these places challenged the existing rules on the commodification of natural waters. Many of the laws in place existed to avoid the issues of fraudulent sales, the issues related to transport, and the certification that bottled waters did in fact come from the place indicated on the label. These issues were non-existent when it came to artificial waters. Since they were made-to-order, there was no discussion as to whether they were mineralised enough to ‘count’ as mineral waters. There was no issue of transport since they were made on site, and their composition was so reliable that any potential adverse health effects were much more predictable.<sup>644</sup> This meant

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<sup>640</sup> That being said, during conflict resolution, the co-owners of Salies, the *partiprenants*, were in regular contact with the intendant of Auch and Pau, but it is not clear whether this title referred to the intendant of mineral waters. See: Correspondence from the intendant in Auch, États de Béarn (affaires d'ordre intérieur) ; eaux et forêts, (1783), H//86, AN.

<sup>641</sup> Communiqué du Conseil, (5<sup>th</sup> March 1783), H//86, AN. “La demande que fait M de Poustoly d'une pension sur le produit de la ferme de la fontaine de Salies en Bearn ne concerne en aucune manière la ferme Générale parce que ce produit est absolument indépendant de son administration.”

<sup>642</sup> See Chapter 9.

<sup>643</sup> Report by Gavinet on a memoir on artificial waters by Nicolas and Paul, (An IX), Ms 258, f187–193, AAL.

<sup>644</sup> See a case from 1810, in which it is argued that the artificial waters should be controlled in the same way as regular medicines bought in pharmacies, rather than like natural mineral waters. “Rapport sur une fabrique d'Eaux minerales artificielles envoyé au Min proposé par Mr Bunivar president du conseil de fonti de Turin”, (1806), AJ/16/930/A, n° 507, AN. “L'établissement de la fabrique d'Eaux minérales que propose monsieur Buniva peut présenter des avantages aux habitants de la ville de Turin et autres lieux circonvoisins, puis qu'il est reconnu aujourd'hui que dans bien des cas les Eaux artificielles peuvent remplacer avec succès les Eaux naturelles. il ne peut donc y avoir aucun inconvenient a permettre un semblable établissement.

that artificial waters, once they started to gain popularity, needed a rather different kind of regulation, further complicating the landscape of remedial water-regulation.<sup>645</sup>

As was seen in chapter two, the major springs of the eighteenth century were spread all over the country. These different types of regions were not equally reachable by transport. The waters were literally decentred within the French kingdom, for the simple fact that said kingdom was centred around Paris, and most of the waters were not conveniently placed on the large web which extended from the capital. They were far from the centre of power, and this physical distance was difficult to overcome by regulators. But being in different regions also meant that the waters were placed under different jurisdictions, and these various jurisdictions differed in the relationships they had with Paris and the crown. Overall, the difficulties in seizing what a mineral water really was, compounded with their geological characteristics made the waters difficult to regulate. But the majority of issues that regulators had to deal with came not from the physical nature of the mineral waters, but from the actors who operated the market.

## Facing challenges to legislation

The *Société's* apparent over-preparedness in crafting the perfect chain of command was not a purely academic endeavour. As the *Société's* authority became known throughout the kingdom, and as its Letters patent were sent to local governments, it encountered resistance, as had the *Commission* before it, and the First physician before that. One of the points of friction was of legal nature, as the Letters patent could not overrule all prior establishments. An example of this happened in 1773, when the *Commission* ran into some issues with a physician from Montpellier, who claimed to have legal ground in denying the validity of the new rules. This individual, named Bonafos, stated that “the inspection of mineral Waters” was a “right inseparable from the protomedicat.”<sup>646</sup> It turned out that the physicians at the Faculty of medicine of

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on peut même dire qu'à la rigueur monsieur Boniva auroit pu se passer de l'autorisation du ministre. En effet les Eaux minerales artificielles pouvant etre coinsiderées comme de veritables medicamens toutes les fois que leur emploi est jugé utile par les medecins, il n'y a pas plus de motifs pour s'opposer a leur fabrication qu'à celle de tous les autres medicamens. il soit donc etre libre a tout pharmacien légalement reçu de fabriquer des Eaux minerales artificielles, pourvu toutefois que leurs composition soit soumise a la même inspection que celle qui a lieu pour toutes les drogues qui se proposent dans les pharmacies.”

<sup>645</sup> In another case from ca. 1810, it was argued that the artificial mineral water establishment should be entrusted to the control of physician chemists, which should be sufficient for a good and reliable management. “Projet d'établissement d'un bureau général d'eaux minerales artificielles privilégié pour les douches et les bains à l'usage des habitants de la ville de paris”, (ca. 1810), AJ/16/6697, AN.

<sup>646</sup> Minutes of the meetings of the *Commission* on the request of the S. Bonafos, 37e assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM. “Le Sr Bonafos ne fut pas satisfait de la

Montpellier obeyed to the old institution of the *protomédicat*, a special jurisdiction on medicine instated in the kingdom of Spain in 1422.<sup>647</sup> At that time, the Montpellier region was part of Spain, and it therefore still operated according to those medieval Spanish rules instead of those of the French kingdom. The Montpellier physicians charged Bonafos with writing to the Parisian institution, asking to be granted the rights to the inspection of mineral waters. In that case, the answer was a swift no. An internal letter at the *Commission* said: “I exposed to you the reasons opposed to the illusory claims of this physician and you deliberated that the commission Royale should not have respect for them.”<sup>648</sup> This was a clear case of the Letters patent of the *Commission* and of the First physician overruling older jurisdiction. The respondents in Paris did advise each other on how to handle the subject delicately though, as the *Commission* could not afford any litigation with the Faculty of Montpellier.

In a very similar instance, the Royal college of Nancy claimed the rights of inspections over the mineral waters of the Lorraine. Given the semi-independence of the region, the legality of the *Commission*'s credentials could be put into question.<sup>649</sup> But again in that case, the complaint was brushed off.

This claim of the royal college is founded, sirs, only on the opinion of the physicians of Nancy. During the establishment of their college there were no bureaux of distribution of mineral waters in Nancy or in the Lorraine. the title of their establishment cannot give them an inspection on an object which did not exist.<sup>650</sup>

The *Commission* was again given the upper hand, on the base of its activity which “must be independent from any law anterior to its promulgation.”<sup>651</sup>

Even if it could prevail in court, the *Commission*'s authority was not always followed, and if fraud was an issue everywhere, it was often harder to address in regions where the legality of the regulations was a little hazy. The members

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justice de votre decision; il assembla la faculté de medecine et fit determiner cette compagnie par le moyen de ses protections à reclamer l'inspection des Eaux minérales comme un droit inséparable du protomedicat.”

<sup>647</sup> Delaunay, *La vie médicale aux XVIe, XVIIe et XVIIIe siècles*, 377.

<sup>648</sup> Minutes of the meetings of the *Commission* on the request of the S. Bonafos, 37e assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM. “je vous exposai des raisons opposées aux pretentions illusoires de ce medecin et vous deliberates que la commission Royale ne devoit point avoir egard à ces dernieres.”

<sup>649</sup> See: Renate Zedinger, *Lorraine et Pays-Bas autrichiens au XVIIIe siècle* (Winkler, 2010).

<sup>650</sup> Minutes of the meetings of the *Commission* on the pretensions of the college of Nancy on the mineral waters, 72e assemblée, (26<sup>th</sup> February 1776), SRM 112, dossier 1, ASRM. “Cette prétention du collège royal n'est fondée, m m, que sur l'opinion des médecins de Nancy. Lors de l'établissement de leur collège il n'y avoit point à Nancy ni dans la Lorraine des bureaux de distribution des eaux minérales. le titre de leur établissement ne pouvoit pas leur donner une inspection sur un objet qui n'existoit point.”

<sup>651</sup> *Ibid*, “ces prérogatives ne peuvent infirmer celles qui ont été accordés à la Com R de par la loi qui a établi son existence et dont l'activité doit être indépendante de toute loi antérieure à sa promulgation.”

of *Commission* regretted the resulting inefficiency. In a letter discussing such issues, an Associate wondered why “a great monarchy” such as the French royal line could not simply be the “unique centre” from which sprouted “all subdivisions”.<sup>652</sup> This yearning for a simple, hierarchical system could be found in other texts lamenting the lack of effectiveness of the law.<sup>653</sup>

This kind of problem happened once more, relative to the mineral waters of Luxeuil, this time because of the parliament of Besançon. Its spokesperson argued that the authority of the *Commission* derived from the Letters patent of 1605. The catch was that in 1605, Besançon was not a part of France, and therefore not under French rule. The parliament argued “we have no Edict of 1605”.<sup>654</sup> The parliament however recognised some advantages of the new legislation. Despite the laws “not having been verified at the Parliament of Besançon”, they still decided to enforce them “in particular for the mineral waters of Luxeuil”.<sup>655</sup> The letter indicated that the First physician had previously granted a permit for an inspector to be in charge of those mineral waters. The only liberty that the region had taken was not to grant said inspector total authority on the pricing of the waters. The price they argued, should be decided freely. This caused further complications with the *Commission*, as pricing the mineral waters consistently was one of its primary aspirations. A number of issues ensued between the inspector in question and the justice system, not all of them were kept in the records unfortunately.

Eighteenth-century town parliaments were far from being puppet institutions manipulated by the king. Created in the medieval era, the parliaments were legislative institutions, essentially local courts, which held a certain amount of prestige and independence.<sup>656</sup> These characteristics made them difficult opponents to overcome, and they took a lot of time from regulators who could not simply ignore their requests. More issues regarding town parliaments not registering permits, even Letters patent, were common enough that I will not recount them all here. Problems comparable to the situation in

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<sup>652</sup> Minutes of the meetings of the *Commission* on the sovereign court of Nancy, 21e assemblée, (26<sup>th</sup> March 1773), SRM 111A, dossier 17, ASRM. “N’est ce pas le procédé le plus raisonnable d’une grande monarchie, que d’avoir un corps principal, pour chaque branche d’administration, qui soit le centre unique, auquel viennent aboutir toutes les subdivisions;”

<sup>653</sup> The archives of the *Commission* especially, often show such mentions, for example: Correspondence to the *Commission*, 76e et 77e assemblées, (3<sup>rd</sup> June 1776), SRM 112 dossier 5, ASRM. Un désordre “favorable aux contrevenans”.

<sup>654</sup> Rapport concernant les eaux minérales de Luxeuil, 21e assemblée, (26<sup>th</sup> March 1773), SRM 111A, dossier 17, ASRM. “Les lettres Patentes lui donnoient pouvoir de commettre par Brevets des personnes de probité et capacité suffisantes pour la distribution exacte et fidèle de ces eaux : cette loy à été enregistrée au grand conseil ; elle ne pouvoit l’être au Parlement de Besançon qui n’étoit point encore sous l’administration française c’est ce qui résulte du préambule des lettres Patentes de 1733. dont sera mention cy après car nous n’avons point Edit de 1605.”

<sup>655</sup> Ibid, “Quoy que ces loïs sages et utiles au Public naient point été vérifiées au Parlement de Besançon elles ont été néanmoins exécutées dans son ressort et en particulier pour les eaux minérales de Luxeuil.”

<sup>656</sup> On the parliaments, see: Alfred Cobban, “The ‘Parlements’ of France in the Eighteenth Century,” *History* 35, no. 123/124 (1950).

Besançon or Nancy also happened in the cities of Toulouse, Nantes, La Rochelle, Dijon and Lyon.<sup>657</sup> It is safe to say that struggling to implement the new laws on the regulation of waters was the norm rather than the exception.

The old systems, despite numerous outcries for a need of reform, were strongly ingrained within regional networks and consequently not easily moved. Those who had received permits to sell waters from the First physician had no reason to believe that their rights could suddenly be nullified. This caused more conflict for the *Commission*, because its creation voided the legality of all previous systems and it therefore had to renew all permits and attributions at once.

The same problem was repeated with the creation of the *Société*, as frustrated mineral water sellers had to renew their permits once more. A few letters sent during the early days of the *Société* attested of this. A bureau tenant expressed that he was “uncertain of the arrangements” that had to be taken with the new institution.<sup>658</sup> The owner of the waters of Saint Martin also wrote to share his confusion, and wondered if the permit he had obtained only a year prior had been rendered invalid by the change of institution.<sup>659</sup> Despite being created with intents of simplifying the medical field, the creation of the *Société* also had immediate adverse consequences for the trade of mineral waters and remedies.

Finally, it is important to consider that significant part of the market of mineral waters in France concerned waters that sprung outside of its borders.<sup>660</sup> This caused uncertainty regarding the legal status of such waters. They could not be regulated with the same closeness as French waters, as the French king obviously had no authority on the transporters in Liège or Switzerland. Some sellers voiced their annoyance regarding the exceptions that were made for foreign waters. In ca. 1774, one seller expressed his surprise at seeing the amount of fraud in the trade of foreign waters go unpunished, exclaiming: “could one believe that His Majesty would allow that his subjects be exposed to being wronged by the infidelity of foreign mineral waters by exempting

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<sup>657</sup> Mémoire de M Raulin à la Commission Royale de Médecine, 37e assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM. Dit avoir été “dans l'obligation d'Ecrire près de 2000 Lettres”. On the parliament of Besançon: Rapport concernant les Eaux minérales de Luxeuil, 21e assemblée, (26<sup>th</sup> March 1773), SRM 111A, dossier 17, ASRM. On the issues in Nancy: SRM 112, Dossier 14. Minutes of the meetings of the *Commission* on the pretensions of the college of Nancy on the mineral waters, 72e assemblée, (26<sup>th</sup> February 1776), SRM 112, dossier 1 and dossier 14, ASRM. On similar issues in Toulouse: Demande du bureau des eaux minérales de Toulouse par Larroure, apothicaire, 15e assemblée, (22<sup>nd</sup> January 1773), SRM 111A, dossier 12, ASRM.

<sup>658</sup> Correspondence from Delpon in Lyon to the *Société*, (1778), SRM 90A, dossier 2. Delpon se dit “incertain des arrangements”.

<sup>659</sup> Correspondence from the owner of the waters of Saint Martin to the *Société*, (ca. 1778), SRM 92 B, dossier 39, ASRM.

<sup>660</sup> See Chapter 2 on the waters sold in Paris, Lyon, Marseille and other bureaus. Many of these bureaus sold the waters of Spa, or Sedlitz for example, which came from the low countries, and Germany respectively.

them from general law?”. He then added “such a thing is not possible. it is removed from all likelihood.”<sup>661</sup> He expressed this while most likely knowing that it was indeed possible for a law to be incomplete, and simply used this argument as a way of reminding the regulators of their duties to their subjects.

This clear wish to see a universal jurisdiction on mineral waters is worth noting. This kind of aspiration was not only voiced by Controller-Generals of Finances and *Société* Associates, but also by a number of sellers and transporters who were regularly inconvenienced by the constantly contradicting legislation. The ideal of centralising all matters regarding remedies was, although essentially unattainable, an aspirational ideal to the people involved with the distribution of waters.

Sometimes, the refusal to follow legislation was more defiant. The *Commission* had all sorts of trouble with the bureau tenant in Lyon, Pariot, who continuously refused to pay his debt of 1900<sup>l</sup> for his privilege. Raulin explained in a letter that he had been in talks with the lieutenant of police following a number of deliberations, but that his good will was being chipped away by the repeated quibbles of Pariot. Raulin explained that Pariot had managed to make himself insolvent by the *Commission*, and the case was eventually dropped.<sup>662</sup>

While the *Commission* and the *Société* were able to overcome most legislative issues, and often win the cases against local parliaments, that did not mean that their authority was always well-received or unchallenged in the different regions of the kingdom. In one instance of conflict between the *Société* and the college of pharmacy of Lyon, the delegates of the latter expressed their disappointment with the *Société*'s inference on their local issues, and wrote, in lightly-veiled bitterness: “Our College is Far from believing that the royal société wants to adopt a tone of despotism on all physicians in the kingdom.”<sup>663</sup> The *Société*'s ambition to centralise, secure and simplify the market of waters did sometimes take on the colour of despotism, at least from the perspective of those who disagreed with it.

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<sup>661</sup> Minutes of the *Commission*, on the correspondence of the intendant of Metz to the *Commission*, 72<sup>e</sup> assemblée (26<sup>th</sup> February 1776), SRM 112, dossier 1, ASRM. “pourroit on penser que S M voulut permettre que ses sujets fussent exposés a etre trompés par l'infidélité des eaux minérales étrangères en les exceptant de la loi générale ? la chose c'est pas possible. elle est destituée de toute vraysemblance”.

<sup>662</sup> Minutes of the *Commission*, Report on the lack of payment by Pariot, 86<sup>e</sup> assemblée, (20<sup>th</sup> January 1777), SRM 112, dossier 14, ASRM. “il eut la prevoyance frauduleuse de faire une separation de biens avec ceux de sa femme, et se rendit par la en apparence insolvable la Com. Rle.”

<sup>663</sup> Collège de pharmacie, Polémique avec la Société royale de Médecine, (ca. 1780), SRM 115A, dossier 8, ASRM. “Notre College est bien Eloigné de croire que la société royale veuille prendre un ton de despotisme sur tous les medecins du royaume.” les corps de médecine sont censés être égaux.

## Disruption of existing systems

Thus far, when describing the advent of the *Commission* and later the *Société*, I have mostly cited the voices of those who demanded order and regulation. But once these institutions were created, not all were happy with the results, nor had all asked for their creation in the first place. The correspondence of the *Commission* was riddled with accounts of overt rule-breaking, inattentive control and unsolvable relationship issues. Many of these issues continued into the years of the *Société*. These conflicts highlight a variety of different concerns. An important part of these issues was the way in which the *Commission's* administration had disrupted the systems that existed before 1772, and how the new regulation, despite its promises of ease and safety, had in actuality pushed a lot of people into illegality, despite them having committed no crime.

A case arose in 1775, which challenged the standards that the *Commission* was trying to uphold. It originated in Montauban, a town in a region rich in mineral waters. A bureau tenant, Brun, was approved by the *Commission* and granted a permit to sell mineral waters. He received recommendations by the mayor and the *échevins* of the town, who testified of his good services as an apothecary. They also praised his charitable work for the relief of the town's poor. Brun promised to pay the fee of 220<sup>l</sup> for his exclusive privilege that extended five miles around Montauban. An additional letter of recommendation signed by five physicians ensured that he was a qualified apothecary, and that he would be perfect for the job of distributor of mineral waters.<sup>664</sup> This kind of profile was essentially ideal given the criteria of the *Commission*. The man was a local, he had support in town, he did not try to haggle down the price of his privilege and had an obvious advantage on other non-medically trained applicants, due to his profession as an apothecary.

And yet, not everyone was pleased with his nomination, once his privilege became public. His proprietorship over the sale of waters in the town was done at the prejudice of Antoinette Lacroix, also resident of Montauban, who had been in charge of selling the waters so far. Brun's monopoly effectively outlawed her commerce. It is difficult to judge whether Lacroix had been made aware of Brun's application beforehand. Since the entire application process took place via letters, it is not impossible that she might have been in the dark about its proceedings until the sentence fell. Another possibility was that Brun used the permit application as a way to take down a competitor with whom he had poor relations; in which case she might have been aware of his attempt to put her out of business.

As Lacroix was a woman, she had no possibility of obtaining medical degrees of any kind, since official medical professions were for the most part reserved to men. But the legislation of the *Commission*, although it tended to

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<sup>664</sup> Correspondence from Brun to the *Commission*, support to Brun's application from the residents of Montauban, 60e assemblée, (29<sup>th</sup> May 1775), SRM 111B, dossier 27, ASRM.

favour people of medical or chemical backgrounds, did not strictly require it. Besides, Lacroix had support. When Brun threatened to fine her for keeping her shop open despite his exclusive privilege, town officials banded together and wrote to the *Société* in support of her bureau. A letter of support was signed by no less than eighteen people, including two local priests, the local abbe, the provost, and a number of *bourgeois*, and town residents. The letter written in her defence stated that “her knowledge of the best springs, her attention to condition them well, and her exactitude towards the public have earned her full trust”.<sup>665</sup> In a memoir attached to the claim, the defendants explain that Lacroix has sold the waters for twenty years with little regard for personal benefit, and always keeping to the best seasons to sell.

A sustained experience of knowledge that she had acquired almost in the crib, because her mother as well as her ancestors had done this commerce in all times, has made her know the best springs<sup>666</sup>

The memoir went on to explain that Lacroix’s commerce of mineral waters was her only source of revenue, and that she was too old to pick up a new trade. As she was referred to as *Mademoiselle* Lacroix, it is clear that she was unmarried, meaning she could not rely on a husband’s income to support herself. The memoir then openly criticised the ignorant decision of the *Commission*, stating that it would have been “more natural” to give the privilege to Lacroix rather than Brun, because the public was “assured that by receiving the waters from her hand there entered no other composition than that of nature”. From the apothecary Brun however, one could not be so sure, as “by receiving them from a pharmacist”, one might be likely to be handed “a composition, instead of mineral waters”.<sup>667</sup> This was a clear argument for the merit of vernacular knowledge, the passing down of know-how in families, in this case from mother to daughter, as a superior form of knowledge to the *Collège* education of an apothecary. This made Lacroix a more trustworthy seller, and most importantly, one whom the *bourgeois* were already accustomed to. They asked for that reason that she be spared from the unfair fine that she was being asked to pay.

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<sup>665</sup> Correspondence from the inhabitants of Montauban to the *Commission*, support to Demoiselle Antoinette Lacroix, 109e assemblée, (7<sup>th</sup> September 1778), SRM 113, dossier 19, ASRM. “sa connaissance des meilleures sources, son attention a les bien conditionnees, et son exactitude envert le public lui en ons meritte toute la confiance”.

<sup>666</sup> Ibid, “Une experiance soutenue de connaissance quelle avais acquise qu'asy dans le berceau, par ce que sa mere ainsy que ses ayeux avaient fais de tous le temps ce commerce, lui avaient fais connaitre les meilleures sources”.

<sup>667</sup> Ibid, “plus naturel den accorder le privilege a l'exposante, qu'au sieur Brun, parce que l'exposante etait dans la possession de cette distribution quelle avait la confiance du public qui etait assure qu'en recevnt les eaux de sa main il n'y entrat d'autre composition que celle de la nature, aulieu que les recevant d'un pharmaciste il aura plutot l'idée de recevoir une composition, que des eaux minerales.”

This case represents a cogent example of the networks that made mineral waters available prior to the inception of the *Commission*. Such instances demonstrate that despite the many complaints of frauds, these networks were also functional, and sometimes even appreciated by the local residents who had no need or wish to see a new institution criminalise their activity. Because of the *Commission* and the *Société's* focus on higher education, either in medicine or chemistry, their rule had the consequence of pushing women out of the market, as they could never acquire such titles.

To be clear, this was not an isolated occurrence. There were many women in the sale of mineral waters, including single women who held bureaus and made a living from them. This case was not even the only occurrence of a permit holder attempting to push a rival bureau held by a woman out of the trade using his privilege. This happened again just a year after the Montauban case, this time in the city of Besançon. A bureau tenant, referred to as Demoiselle Fleur, held what appears to have been a well-stocked bureau, selling waters from Spa, Seltz, Bourbonne, Contrexéville, Bussang and Vichy.<sup>668</sup> A note in the *Commission's* meeting minutes even suggested that these waters were sold “at the most just price.”<sup>669</sup> But despite this statement, another note added that the parliament of Besançon should be promptly contacted by the *Commission*, which should not be all too “careful” in the enforcement of the privilege.<sup>670</sup>

These kinds of instances suggest that sometimes, the “charlatans” who were selling waters illegally were simply former legitimate businesses that had been turned to illegality by the monopolistic legislation. But this kind of distinction can only be found when people stood up to the *Société* voluntarily. In Dijon when an applicant wrote to be granted the permit, he explained that the main advantage of his enterprise would be that people would no longer need to get their waters from the local charlatan. In this case, it is hard to know if that charlatan was an actual con-artist, or perhaps just a regular seller, who was being slandered by his rival, to harm his potential chances if he tried to obtain a permit.<sup>671</sup>

Although shows of solidarity like the Montauban case were uncommon, issues related to disruption of prior systems could be seen in other areas of the market. Juvet, an intendant in Bourbonne made an interesting complaint to the *Commission* in that regard. He had been nominated for life, before 1772, and was shocked to hear that he had to reapply to keep his position upon the *Commission's* creation, stating that no one could “dispute us the quality of born

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<sup>668</sup> Minutes of the *Commission*, on the bureau of Demoiselle Fleur, 72e assemblée, (26<sup>th</sup> February 1776), SRM 112, dossier 1, ASRM. “la demoiselle fleur ainée continue de tenir un magasin des eaux min : de toutes especes, particulièrement des eaux de wals eaux de spa, eau de seltz, eaux de Bourbonne, eaux de contrexeville, eaux de Bussant de vichy;”

<sup>669</sup> Ibid, “elle remit exactement tous les quinze jours et qu'elle debite au plus juste prix.”

<sup>670</sup> Ibid, “ne sçauroit agir avec trop de ménagement”.

<sup>671</sup> Minutes of the *Commission*, on the bureau of Dijon, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM.

Inspectors of the King's Waters in Bourbonne".<sup>672</sup> He was nevertheless, summoned by the *Commission* to put together an application, just like anybody else, and to send his credentials.<sup>673</sup> The former intendant replied, complaining that his servants forgot to answer in time, but claiming that he had already published an analysis of the waters back when he was first granted his title. He added that his analysis had been praised at the time, implying that he had no intents on making another one for the sake of changing regulation.<sup>674</sup>

These pre-existing systems often relied on family businesses. Inheriting a bureau of distribution of mineral waters was an asset, especially in the rising poverty of late eighteenth-century France. Most sellers before 1772 inherited their trade from their parents, sons and daughters alike. A number of letters show the attempt to keep these family bonds in place, with fathers writing asking the *Commission* to give their position to their son upon their death, stating their merits, sometimes attaching a number of credentials stating why the son was deserving of the inheritance.<sup>675</sup>

In 1776, instead of a group of people banding together to help a more deserving bureau tenant, a group instead formed to attack a newly appointed distributor. The *syndics* of the Béarn wrote to the *Commission* to ask for the repeal of a permit that had been granted to a man named Miette, a bureau tenant in the town of Pau.<sup>676</sup> They showed awareness of the legislation by referring to the 1605 Letters patent, but they argued that this particular permit had been issued to an undeserving applicant.<sup>677</sup> They listed their motives for such an accusation, explaining that the waters had actually increased in price since the establishment of the bureau, that it was only selling French waters when foreign waters were also in demand, and that the distribution was

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<sup>672</sup> Correspondence from Juvet to the *Commission*, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM. "on ne peut nous disputer la qualité d'Inspecteurs nés des Eaux du Roi à Bourbonne ; pour cela il faudroit être et ne pas être."

<sup>673</sup> All of the credentials are found in: Minutes of the *Commission* and correspondence from Juvet to the *Commission*, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM.

<sup>674</sup> From the *Société's* archives, it does not appear that he ever sent a new analysis of the waters of Bourbonne. He did communicate with the *Commission* and the *Société* about the diseases of his region a few years later though, suggesting that he probably was granted his position, and therefore had no conflict with the institution. Montrol and Juvet, "Observations météorologiques et nosologiques", (1778–1780), SRM 196B, dossier 13, ASRM.

<sup>675</sup> See chapter 4, and see: Correspondence from Desguerres to the *Commission*, 22e assemblée, (15<sup>th</sup> April 1773), SRM 111A, dossier 18, ASRM.; Correspondence from the intendant of Montpellier, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM.

<sup>676</sup> Correspondence from the États du Béarn to the *Commission*, 78e assemblée, (1<sup>st</sup> July 1776), SRM 112, dossier 6, ASRM. Miette's permit had indeed been granted, see: Brevet de distributeur pour 6 ans, en Basse-Navarre, Béarn, pour Miette, signé de Vicq d'Azyr, (20<sup>th</sup> October 1780), SRM 94, dossier 10, pièces 7–8, ASRM.

<sup>677</sup> Minutes of the *Commission* on the correspondence from the États du Béarn to the *Commission*, 78e assemblée, (1<sup>st</sup> July 1776), SRM 112, dossier 6, ASRM. "Les états du Bearn peu instruits sans doute des justes motifs qui en 1605 déterminèrent henri IV leur ancien souverain à créer une surintendance des eaux minerales du royaume [...] ont délibéré le 31 janvier dernier que mm les syndics des états demandent la révocation du brevet accordé par sa majesté au Sr Miette en vertu duquel il a établi à Pau un bureau de distribution des eaux minérales."

becoming increasingly unreliable under his privilege. The states of Béarn made it clear that the main issue with such a bad distributor was that he held the monopoly on the sale of waters in the region. If he was not the only distributor allowed to practice, there would be alternative options to his bad bureau. Previously, a number of families used to make a living on the sale of mineral waters, but now, the only option was the terrible commerce of Miette.<sup>678</sup> They concluded by saying that “the permit granted by his Majesty to the Sir Miette can only be the effects of ill-founded zeal”.<sup>679</sup>

This case shows that, while many physicians liked to complain about the many sellers of mineral waters that were unaccredited, and allegedly putting the public at risk, the local governors who represented the public rather than the medical authorities, sometimes favoured the existence of competition between several different bureaus. To some extent, the buyers appear to have enjoyed being able to form a relationship with their own chosen seller and did not want that choice taken away from them.

The *Commission* responded to this by detailing the many advantages of having Miette be the seller for the town of Pau, including a diminution of the price of the waters, despite the claims of the *syndics*. They also added that the *Commission* would consider adding a second bureau in the region, if the *syndics* insisted on it, but that seemed hardly viable. In return, they accused the *syndics* of supporting illegal commerce, and stated that these supposed families who lived on the commerce of mineral waters were breaking an important law and should not be defended for it. Finally, the document from the *Commission* added:

the distribution of mineral waters cannot be a commerce. Mr the syndics are still wrong in this; it must be regarded as a deposit of trust in favour of the suffering humanity. it is for this just reason that since the sixteenth century our Kings and our sovereign courts have confirmed the law which establishes that the distribution of mineral waters must only be permitted to people of trust authorised by particular permits.<sup>680</sup>

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<sup>678</sup> This is corroborated by a complaint which Miette made to the *Commission*, claiming that a grocer, a transporter, and an apothecary, all kept on selling waters in his town, despite his supposedly exclusive privilege. Correspondence from Miette to the *Commission*, (1773–1789), SRM 91A, dossier 6, pièces 1–16, ASRM.

<sup>679</sup> Ibid, “Ces six motifs qu'alleguent les états du beam pour demander la révocation du brevet accordé par sa Majesté au S Miette ne peuvent être que les effets d'un zèle mal fondé.”

<sup>680</sup> Minutes of the *Commission* on the correspondence from the États du Béarn to the *Commission*, 78e assemblée, (1<sup>st</sup> July 1776), SRM 112, dossier 6, ASRM. “5° la distribution des eaux minérales ne peut pas être un commerce. Mr le syndics se trompent encore en cela ; on doit la regarder comme un depot de confiance en faveur de l'humanité souffrante. c'est par cette juste raison que depuis le seizieme siecle nos Rois et nos cours souveraines ont confirmé la loy qui établit que la distribution des eaux minerales ne doit être permise qu'à des gens de confiance autorisés par des brevets particuliers.”

This argumentation against the idea of profit was used as a way to exert moral superiority over the local government, which was accused of seeing the mineral water market solely as a money-making operation. The more morally inclined *Commission* on the other hand, argued that by forcing the region to remove competition between bureaus, it made the commerce of waters more selfless, and better suited for patients.

Even the imposition of chemical analysis was not seen as an unalloyed good by all within the market of waters. Although the practice of evaporating water to observe residue had been known since the early Renaissance, the eighteenth-century method of analysis was subject to changes and updates. With it came the possibility of evaluating the quality and effects of a water by measurements, rather than by the experience of cures. This was a deep change for the practitioners who were used to prescribing waters based on empirical observations. The complexity of sentiments surrounding this shift in method is summarised by the physician Herrenschwann who sent his work on the waters of Habsbourg to the *Société*:

In olden times, experience alone made the reputation of the mineral waters in Switzerland and decided on the way to use them, multiplied successes accredited them from person to person for similar cases; [...] In more modern times reasoning changed this trivial march; the desire to give extension to the known virtues gave excitement to made experiments; of which the ill successes rebounded so much on the remedy alone, that some excellent baths, and most healthy waters, fell into discredit, and stayed in oblivion until the time that some analyses poorly or well done got them out of it.<sup>681</sup>

According to Herrenschwann, the early attempts at analysis were guided by reason and by a will to judge waters based on scientific grounds rather than tradition. Unfortunately, this new science was too quick to be trusted and caused damage to the reputation of some waters. As analysis improved though, it could redeem its earlier mistakes by re-examining and asserting the qualities of previously misclassified waters with a new-found scientific authority. As of 1782, when Herrenschwann sent his work, his trust in the method was acquired, as he even called on other analysts to come and exercise their expertise in order to further confirm the rightness of his findings.

These examples suggest that the centralisation of power over the market promoted by the *Commission* was not always welcome by those on which this

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<sup>681</sup> Memoir sent to the *Société* by Herrenschwann, (1782), SRM 93B, dossier 34, ASRM. “Dans les tems reculés, l’expérience seule fit en Suisse la réputation des eaux minérales et fixa la marche d’en user, des succès multipliés les accréditèrent de proche en proche pour des cas pareils ; on bat les eaux, on prit les bains tout uniment à la mode du Pays, et communément avec succès. Dans des tems plus modernes le raisonnement fit changer la marche triviale ; le désir de donner de l’extension aux vertus connues excita a faire des expériences ; dont les mauvais succès rejaillirent tellement sur le remède seul, que d’excellents bains, et des eaux des plus salubres, tombèrent dans le discrédit, et restèrent dans l’oubli jusqu’au tems que des analyses mal ou bien faites les en ayant tiré.”

power was enacted. In particular, the sweeping changes that it attempted to make, like the handing out of special and monopolistic privileges which tended to exclude a lot of people from the trade, were not popular. Not only were the newly criminal water-sellers upset with the unforeseen regulation, but their buyers felt cheated sometimes too. For a patient who had been accustomed to purchasing a particular Spanish mineral water in the Béarn for example, the arrival of Miette and his French-only stock might have been seen as a threat to his or her health. This resentment against the new regulations made them all the more difficult to implement, as some people felt empowered to challenge them. And as it happened, the *Commission* and the *Société* were already busy getting their own backyard – the Paris bureau – in order, and were not always able to strike those who defied the rules elsewhere.

## The privileged position of the Paris bureau

Against the hope of the founders, the best diplomacy that the *Société* had to offer was rarely used on prestigious foreign scientists, but rather went to conflict resolution. A lot of this conflict emanated from the Paris bureau. The distributor of mineral waters in Paris during the 1770s and 1780s was named Arnaud. He featured in many cases of contention and appears to generally have been a constant source of issues which the *Commission* and the *Société* had to resolve throughout the years. Despite the proximity of Arnaud's bureau to the *Société's* quarter, the problems he encountered were similar to those of other provinces. The way these problems were handled however, differed from other bureaus. Being the distributor of the *bonne Ville de Paris*<sup>682</sup> did warrant special treatment, and additional scrutiny.

The *Commission* approved Arnaud's bid to become sole distributor in Paris in 1773.<sup>683</sup> His privilege was made public in the medical paper *Gazette de Santé*, as well as on posters displaying the prices of the mineral waters.<sup>684</sup> These advertisements indicated where to find his bureau, "in Paris, rue des Prouvaires, entering through rue S. Honoré".<sup>685</sup>

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<sup>682</sup> Common colloquial name for the capital in the eighteenth century, meaning "our good city of Paris".

<sup>683</sup> Minutes of the *Commission*, Arnaud's bid for distribution of the waters in Paris, 16e assemblée, (25<sup>th</sup> January 1773), SRM 111A, dossier 13, ASRM.

<sup>684</sup> J.J. Gargane, "Gazette de Santé," (Chez Ruault, Libraire, rue de la Harpe, 1773–1774), 80.; Poster on the prices of waters in Paris, (not dated, likely ca. 1778), SRM 95, dossier 1, ASRM.; Printed poster on the prices of the waters in Paris, (undated), SRM 94, dossier 7, pièce 179, ASRM. Later on, his privilege was also published in the town's newspaper, which started printing in 1777: "Journal de Paris," (De l'Imprimerie du Journal de Paris, même Maison, 1791), Avis, iiiii.

<sup>685</sup> Ibid, "Le sieur Arnaud, seul privilégié, fait le transport, vente & distribution de toutes les Eaux Minérales de France & Etrangères, à Paris, rue des Prouvaires, en entrant par la rue S. Honoré; à Versailles, rue du Chenil, à l'ancien Hôtel de Girardain;"

One of the first orders he received was to diminish the price of most bottles, in accordance with the new pricing policy of the *Commission*. In the first summer of his tenancy however, he asked for the diminution of prices to be delayed. He had purchased all of his stock at the original prices, and was set to lose a total of 3,000<sup>l</sup> if his inventory was to be sold at reduced cost.<sup>686</sup> By August, he wrote to the *Commission* again, explaining that he still had some matters to attend to before the prices could be lowered. He also asked that the waters of Bonnes, Barèges, Cauterets, Balaruc, Vals and Cransac only be lowered by 10] instead of 15]. Since those waters accounted for most of his profit, a substantive price reduction would be too much for him to withstand financially.<sup>687</sup> The pricing policy, and in particular the necessity of keeping prices low and fixed, was perhaps the strictest resolve of the *Commission*, and Arnaud had already challenged it twice in his first year of activity.

When he was not asking for leniency, Arnaud became quite the expert at deflecting blame. He endured some heat after the bureau of the neighbouring town of Fontainebleau received a very poor report.<sup>688</sup> In that bureau held by Nogaret, the price of the waters was too high, and very few waters were labelled correctly.<sup>689</sup> Nogaret when confronted with the sorry state of his bureau accused Arnaud of having failed to send him the decree on the new administration of mineral waters, implying that he was simply ignorant of the new regulations. Arnaud, unhappy with the blame, claimed that Nogaret's servant must have failed to transmit the letter containing the new orders. Nogaret seemed pleased with the excuse and chided with Arnaud to also blame his servant for the lack of proper communication.

The servant in question was asked about the situation by an Associate of the *Commission*, and she simply explained that she had done nothing but follow the orders she was given. In the end, the *Commission* sided with the servant, finding it more believable that both bureau directors had been lacking in their duty rather than believing that a single servant could be responsible for the state of disrepair of the bureau. It was feared that this "Infamy" might "fall back on the Royal commission", and that in order to avoid further trouble, Arnaud should be summoned to attend the next assembly in order to hear "a

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<sup>686</sup> Correspondence from Arnaud to the *Commission*, 26e assemblée, (21<sup>st</sup> June 1773), SRM 111A, dossier 20, ASRM.

<sup>687</sup> Correspondence from Arnaud to the *Commission*, 29e assemblée, (2<sup>nd</sup> August 1773), SRM 111B, dossier 21, ASRM.

<sup>688</sup> The Paris bureau appears to have been partly responsible for the relatively close by bureau of Fontainebleau. This is however not mentioned in Arnaud's permit. Minutes of the *Commission*, Nouveau bail de 5 ans accordé à Arnaud distributeur de Paris, 100e assemblée, (5<sup>th</sup> January 1778), SRM 113, dossier 10, ASRM.

<sup>689</sup> Memoir by Raulin, 37e assemblée (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM. "J'y vis avec le plus grand etonnement une confusion et un desordre incroyable ; dans le nombre des bouteilles qui etoient exposées a la vue; Des caraffons sans etiquetes en sans cachet de la Commission que la fille a qui je demandai quelles pouvoient etre les Eaux qu'ils contenoient, me repondis que c'etoit des Eaux de Bonne".

strong reprimand” and an injunction to be more “cautious, more attentive, less ardent to earn”.<sup>690</sup> The position of Arnaud was unique in that sense, that if he failed to his duty badly enough, he could receive a direct scolding from his superiors. This level of scrutiny was never enacted on other bureaus.

Two years later, Arnaud was found again in the letters of the *Commission*, answering for his lack of payment of the bi-annual fee. He explained that for the time being, the low season coupled with an unfortunate accident meant that he was low on liquidities.<sup>691</sup> Some months after that, he found himself in some controversy for asking his clients to return empty bottles to his shop. A doctor at the Faculty named Cosnier wrote to the *Commission* himself, to tell on Arnaud’s practice of asking servants to bring the bottles back to him: “what use does he have [for the bottles]? the secret is not difficult to penetrate. To refill them.”<sup>692</sup> Cosnier, showing awareness of the legislation, complained that the inspectors in charge of the Paris region were doing a rather poor job of checking on their distributor, or perhaps “Sir arnault does not care about them [*se moque d’eux*]”.<sup>693</sup>

The inspectors, not wanting to be seen doing nothing, came for Arnaud shortly thereafter. Upon their visit, they noted that some things were off. Some bottles, especially foreign ones, were only half filled. Arnaud defend himself of this, explaining that he had already reported this to Raulin years prior, and had reprimanded his transporter several times for bringing too little water. The inspectors concluded that this particular “infidelity” was to be blamed on the transport, not the bureau.<sup>694</sup> As for the reusing of bottles, the inspectors did not comment, since it was a common and accepted practice in the mineral water market.

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<sup>690</sup> Report on the visit at the bureau of Fontainebleau, 37e assemblée, (6<sup>th</sup> December 1773), SRM 111B, dossier 22, ASRM. “sans quoy ces Infamies retomberoient sur la commission Royale”. “Je crois Messieurs qu'on ne scauroit se dispenser de mander le Sr Arnaud a la chambre de lui faire une forte vesperie de lui enjoindre detre plus circonspect, plus attentif, mois ardent a gagner”.

<sup>691</sup> Correspondence from Arnaud to the *Commission*, 56e assemblée, (6<sup>th</sup> March 1775), SRM 111B, dossier 23, ASRM.

<sup>692</sup> Correspondence from Cosnier to the *Commission*, 60e assemblée (29<sup>th</sup> May 1775), SRM 111B, dossier 27, ASRM. “s’il donne des bouteilles de peintes il veut que les domestiques luy raportent les flacons avides. quel usage en veut il faire. le secret n’est pas difficile à penetrer. Les remplir.”

<sup>693</sup> Ibid, “vous avies nommé plusieurs de vos membres pour inspecter la conduite du Sr arnault, reconnoistre les bouteilles d’eau minerale et assurer le public de la bonté des eaux. ou ces Ms exectuent bien negligemment leur commission ou le Sr arnault se mocque d’eux.”

<sup>694</sup> Minutes of the *Commission*, the inspectors of Paris relay Arnaud’s plea, 64e assemblée (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM. “nous avons également reconnu qu’il n’y avoit pas de la faute du Sr Arnaud, qui nous a présenté des lettres du Sr Rubremen écrites precedément par lesquelles il s’engage de fournir des cruches de mesure dont le Sr Arnaud lui avoit déjà deux fois fait passer le modèle, en lui envoyant deux cruches tenant deux pintes chacune.”; “[Arnaud] s’en remet totalement à sa justice, n’ayant d’autre ressource qu’en la bienfaisance de cette compagnie dans la malheureuse circonstance où il se trouve.”

More complaints came up on this particular point, however. In the face of repeated accusations, Arnaud had to defend himself to the *Commission* once more. He wrote two letters which were discussed at two meetings of the *Commission* in succession, in August and September 1775. In the first letter, Arnaud claimed that the practice of recycling bottles completely normal, and he wondered why “a custom established in all Provincial bureaus” would be forbidden in Paris.<sup>695</sup> If Arnaud was correct in this assessment, he was then pointing out directly that the scrutiny of the *Commission* was indeed more lenient in other regions, which would go against its principles of control and centralisation. Arnaud explained that, due to public pressure, he had to restrict the practice of returning bottles solely to those from Vichy. In his view, it was justified because those bottles were particularly sturdy, and they also contained a little more than a pint, so the customer was getting a good deal from them.<sup>696</sup>

This is quite typical of Arnaud’s behaviour in the correspondence. He, and many other bureau tenants, often tried to bend the rules slightly, but always in a way that could be explainable with a bit of good faith. This also showed that he took the *Commission*’s regulation seriously, but did not see it as an absolute law, and the circumstances showed that he was correct in this assumption.

This was perhaps best expressed in a second letter, in which he tried to respond to all accusations that had been made against him. First, he explained that if on rare occasions he failed at his responsibilities, “it has never been my fault I have been forced by unfortunate circumstances”.<sup>697</sup> His second reason was perhaps less expected. He explained that he had supplied the Faculty, and in particular Augustin Roux (1726–1776), the chemistry teacher, with bottled waters for analysis. He had sent them for free, asking only that the empty bottles would be returned to him.<sup>698</sup> After showing such generosity towards the Faculty, he did not expect to be treated so poorly in return.<sup>699</sup>

Arnaud was aware of his closer relation with the Parisian authority. He relied on a more traditional, and perhaps more merchant way of acting, based on the exchanging of favours and interpersonal relationships. And while the

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<sup>695</sup> Correspondence from Arnaud to the *Commission*, 65e assemblée (4<sup>th</sup> September 1775), SRM 111B, dossier 32, ASRM. “Messieurs, c'est un usage etabli dans tous les bureaux de Province de reprendre toutes les Bouteilles vides Pourquoi cette facilité me seroit-elle interdite ?”

<sup>696</sup> Ibid, “A l'Egard des Bouteilles vuides qu'on a toujours été dans l'usage de reprendre au bureau et qu'on me fait un crime de recevoir aujourd'huy, j'ai restrains cet usage aux bouteilles de Vichy de pinte parce qu'elles sont très fortes et qu'elles tiennent plus que la pinte”.

<sup>697</sup> Correspondence from Arnaud to the *Commission*, 64e assemblée, (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM. “si quelques fois je me suis ecarté [de mes engagements], il n'a jamais été de ma faute j'y ay été forcé par des circonstances malheureuses”.

<sup>698</sup> Ibid, “M Roux Professeur aux Ecoles suivans la lettre cy jointe ma fait l'honneur de me demander des Eaux pour ses experiences, je les lui ay offertes au même prix et conditions que cy dessus;”.

<sup>699</sup> For clarity, this happened before the controversy between the Faculty and the *Société*, as this all took place in the time of the *Commission*. Arnaud was therefore not committing a *faux pas* by assisting the Faculty.

*Commission* was claiming to enforce strict health legislation, which was not made to accommodate this kind of compromise, it was often forced to do so. In this light, most of his defences makes more sense. Arnaud expected to be trusted, because he considered himself a good bureau tenant who also knew a lot about his own stock. He complained for example that often, people returned bottles that had been freshly tested for quality. Specifically, sulphurous waters were often returned with complaints of bad smells, when clients ignored that they were in fact supposed to smell like that.<sup>700</sup> Arnaud was frustrated that his clients would not trust him, as he knew better than most was the bottles were supposed to smell like. He finished his letter by stating that, thankfully, a number of his buyers did trust him, and had always had good dealings with him, which was not cited often enough in his opinion.

This defence worked for a time, and the *Commission* did not further reprimand Arnaud. Two years after, another issue arose concerning the Parisian distributor. This time, he was going to need the active help and support of the *Commission*. Le Veillard, the owner of the nearby waters of Enghien wished to sell his waters in Paris directly, without having to go through Arnaud. The matter was grave enough to warrant an exceptional meeting of the *Commission*. Le Veillard's interests were defended by the prestigious lawyer of the Prince de Condé,<sup>701</sup> but his defence was "annihilated by the response of m. Limbergue attorney in the parliament".<sup>702</sup> The annihilation came from the invocation of the Letters patent of the First physician, once again the ultimate legal weapon in such matters. Le Veillard did not see this defeat as final though, and two years later he tried once again to have a rival bureau established, which would only sell Enghien waters but would still not be affiliated with Arnaud's bureau in any way. This time, Le Veillard tried to attack Arnaud's practice, in the hopes that he would fall out of favour with the members of the *Commission*. He stated that Arnaud's principles "seem to have no other basis than his particular advantage",<sup>703</sup> and asking once again to be able to set up an antenna of his Enghien bureau within Paris *intramuros*,<sup>704</sup> in order to save his buyers the trip. But this time again, the *Commission* stepped up to defend their distributor.

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<sup>700</sup> Correspondence from Arnaud to the *Commission*, 64e assemblée, (21<sup>st</sup> August 1775), SRM 111B, dossier 31, ASRM.

<sup>701</sup> He was a prince, member of house Bourbon. His youth title was Duke of Enghien, which is probably the reason why his attorney would be concerned with the issues related to the locality.

<sup>702</sup> Correspondence from Jacquart to the *Commission*, 91e assemblée, (5<sup>th</sup> May 1777), SRM 113, dossier 1, ASRM. "les moyens de deffense qu'il employa, furent aneantis par la reponse de m. limbergue avocat au parlement".

<sup>703</sup> Correspondence from le Veillard to the *Commission*, 91e assemblée, (5<sup>th</sup> May 1777), SRM 113, dossier 1, ASRM. "ses principes paroissent n'avoir d'autre baze que son avantage particulier".

<sup>704</sup> Inside of Paris' walls, meaning in the city.

the rights of property do not extend beyond the spring, they are restricted to it by those of the superintendency, nothing more certain; the claims of the Sir le Veillard can therefore only be delusive<sup>705</sup>

The *Commission* was certain that Le Veillard's wishes could not be carried out. The letters describing the problem also show support towards Arnaud. He had been chosen as the rightful distributor of waters, they had to "protect him against the affronts that could be carried against him, and maintain him in all his integrity".<sup>706</sup> Such obligations match the ambitions of the *Commission*, but it was uncommon in practice to see them applied with such dedication.

This closeness with the Paris bureau remained in the age of the *Société*, although few major conflicts took place after 1778.<sup>707</sup> Arnaud's permit was renewed upon the *Société's* creation with no changes. It was clear that, contrary to a majority of regions, the rules did not relax in Paris. The inspectors who slowly had to loosen their grip on the market everywhere else, were still watching Arnaud's bureau carefully, and the inspectors for Paris were often *Société* associates.<sup>708</sup> This kind of careful surveillance was much more difficult to enact in the rest of the kingdom.

## *Extramuros* conflict resolution

The case of Paris shows the number of issues that could arise, even with the constant watch from the nearby *Société*. Arnaud was seemingly in an endless wheel of conflicts, but when he needed help, he had the luxury of being able to talk to an Associate directly. This was not the case for most people in the wider network of the institution. For this reason, it is important to contrast the case of the Parisian bureau with an example of conflict resolution in a township of the south of France, for which no face-to-face diplomacy could be conducted.

The matter of contention took place in Sommières, a small town about 10 kilometres from Montpellier. This conflict was the result of a break in the family ties that held many of the small mineral water-selling enterprises

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<sup>705</sup> Minutes of the *Commission*, on the correspondence from le Veillard to the *Commission*, 91e assemblée, (5<sup>th</sup> May 1777), SRM 113, dossier 1, ASRM. "les droits de propriété ne s'étendent pas au delà de la source, ils y sont bornés par ceux de la surintendance, rien de plus positif; les prétentions du Sr le Veillard ne peuvent donc être que chimeriques."

<sup>706</sup> Ibid, "vous avez donné au sr: arnaud directeur du Bureau general de paris, un privilege exclusif pour la vente a toutes les eaux minérales, dans cette capitale et son arrondissement ; non seulement vous ne pouvez plus aujourd'hui démembrer son privilege, mais vous devez même le garantir des atteintes qu'on voudrait lui porter, et le maintenir dans toute son integrité".

<sup>707</sup> In those years, Arnaud might have still inserted himself in some conflicts, but fewer that required the direct attention of the *Société*. He was named for example in several sources as one of the conspirators against Debrest, mentioned in Chapter 2.

<sup>708</sup> Procès-verbaux des commissaires envoyés chez Arnaud, (1773–1791), SRM 94, dossier 8, ASRM.

together. The documents that describe the events are somewhat sparse, but precise enough to get a sense of the major points of conflict. Jacques Negre, a perfumer and merchant, became the distributor of mineral waters in Montpellier when he received a permit from the First physician Sénac in ca. 1753.<sup>709</sup> In the years of operation, the bureau encountered financial troubles, as Negre wrote to Sénac on occasions asking if he could raise the price of certain waters, or justifying delayed payments.<sup>710</sup> When the *Commission* was formed in 1772, it requested that all permit holders apply again to be granted their privilege. Negre complied and sent the relevant documentation in 1773.<sup>711</sup> He could keep his bureau, provided he paid the annual fee of 800<sup>l</sup> to the *Commission*, and kept to the imposed prices. In exchange, he received the right to be the sole seller of mineral waters not only in Montpellier, but also in four other neighbouring villages including Sommières.<sup>712</sup> Negre was asked to submit to the authority of Henri Fouquet who was the inspector of mineral waters for the Montpellier region. In return, Fouquet oversaw communication with the *Commission* regarding any trouble that came up in his jurisdiction.

When making his 1773 application, Negre was approaching old age. He felt the need to ensure the legacy of the bureau by asking for his son to be named as the heir to the bureau, upon his death. His son was at the time most likely underage, and involved in an apprenticeship to become an apothecary in Sommières. Upon reaching his majority, the son felt cheated by the deal his father made and started to take steps towards obtaining the rights for the bureau straight away, instead of having to wait for his father's passing. Fouquet's correspondence alluded to a rather ugly fight between father and son, as the son tried to argue that he alone should receive the profit from the bureau, as it had been registered in his name. He also attempted to argue "in court, under the pretence that he did not have the age required by the laws when he consented to this act".<sup>713</sup> Essentially, the son tried to argue against the validity of the contract, particularly the passage which stated that his father would hold the bureau until his death. At the same time, he tried to argue that because the contract was in his name, the bureau should be his rightful property.

There appears to have been a number of back-and-forth letters between the father, the son and the inspector, but not all have been transcribed in the records of the *Commission*. One letter from the father however, was kept. He

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<sup>709</sup> Nomination de Nègre, comme distributeur des eaux par Jean Sénac premier médecin du roi, (ca. 1753), SRM 90B, dossier 25, pièce 7, ASRM.

<sup>710</sup> Supplique de Nègre à Sénac pour pouvoir augmenter le prix des eaux de Vals de 36 à 40 s. la bouteille, (1760), SRM 90B, dossier 25, pièce 8, ASRM.

<sup>711</sup> Certificat de religion catholique de Nègre, Certificat de bonnes vie et mœurs, (1773), SRM 90B, dossier 25, pièce 3–4, ASRM.

<sup>712</sup> Arrêts de la cour des comptes de Montpellier (3<sup>rd</sup> April 1753 and 2<sup>nd</sup> December 1782), SRM 90B, dossier 25, pièces 14–16, ASRM.

<sup>713</sup> Correspondence from Fouquet to the *Commission*, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. "pretend s'en faire relever aujourd'hui en justice, sous pretexte qu'il n'ait point l'âge requis par les loix lorsqu'il a consenti cet acte".

could be seen begging the *Commission* to rewrite the permit in his own name, thus excluding his son outright.

only his misbehaviour and his dissipations which have no bounds and which multiply to the point of making me fear a terrible future and it is to prevent it and to make [my son] come back from his wanderings that I must use means that seem to me the most proper to succeed<sup>714</sup>

He argued that erasing his son's name from the permit was the only way to startle him into atoning for his awful behaviour. The father apologised at length in the letter, asking for forgiveness for all the time wasted on behalf of the inspector. He explained that his son had been terrible at handling finances for a long time, describing his many losses throughout the years, justifying why he should not be trusted with the bureau. Given that the son was specifically asking for the right to pocket the profits from the bureau, rather than take on its administration, some credence can be given to this statement. This was quite clearly at odds with the *Commission's* efforts to moralise the market of waters. A profit-driven future owner augured more trouble.

Fouquet, the inspector, attempted to calm the discord and find the best way to reconcile both parties. He explained, in a letter to Raulin, "I have examined this affair with care, I know all its details in full".<sup>715</sup> This kind of phrasing gives an incline of what kind of work was done, not by the *Commission*, but within its network, and by the people in charge of keeping communication between the regional bureaus and the Parisian administration. This could be hard work, as one can imagine from this case.

Here, Fouquet had to take sides, and he chose to defend the father. He asserted: "nothing is more reprehensible than the behaviour of M Negre, the son towards his father".<sup>716</sup> Fouquet himself lived in Montpellier and was thus likely to know the father personally. It is not unthinkable that he had further insight in the history of the troubles that Negre had endured over the years. Fouquet concluded that if "the royal commission grants negre the father what he demands, it will make an act of justice by giving his son a lesson in family

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<sup>714</sup> Correspondence from Negre the father to the *Commission*, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. "seul son econduite et sur ses dissipations qui nont point de bornes et qui se multiplient au point de me faire crainde un avenir affreux et ces pour le prevenir et le faire revenir de ses egarements. que je me dois a user des moyens qui me paraissent les plus propres pour y reussir celuy de vous supplier de me faire la grace de faire expedier le nouveau brevet a mon nom. pourra luy faire quelque impression."

<sup>715</sup> Correspondence from Fouquet to the *Commission*, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. "j'ai examiné avec soin cette affaire, j'en connois à fond tous les details".

<sup>716</sup> Ibid, "rien n'est plus rephensible que la conduite de M Negre, le fils à l'egard de son pere qui a dailleurs beaucoup d'autres sujets de plainte contre lui."

piety that he seems to ignore far too much”.<sup>717</sup> Administering the mineral water market could, as it turned out, entail lecturing young men with overspending habits and teaching them respect for their elders.

With the inspector taking the father’s side, and the *Commission* agreeing, the son was forced to apologise. He wrote to the *Commission* stating his deep remorse for his conduct, and approving the transmission of the permit back to his father in full, with the knowledge that all profit or deficit generated by the bureau was to be handled by his father.<sup>718</sup> In a final letter to the *Commission*, Fouquet expressed his relief, saying “It has not been without difficulty that I have managed to reconcile both parties much irritated and much angered against one another; but at last I have succeeded despite the violent character of a close parent of one of them”.<sup>719</sup> The inspector empathised once more with the troubles of the father, asking the *Commission* to enact “a little softness” regarding the cost of registering the new permit, alluding to the many expenditures that the father already had to make.<sup>720</sup>

In the end, Fouquet was congratulated for his diplomatic solution, as the *Commission* praised him by saying “nothing as wise, indeed than the party that you have taken in this matter”, thanking him for avoiding “a kind of small civil war” in the Montpellier region which would have led to great dishonour if pushed to further extents.<sup>721</sup> His diplomatic touch apparently paid off, as upon the creation of the *Société*, Negre’s permit was renewed once more and the sales of mineral waters could continue beyond the family feud.<sup>722</sup>

This first case represents an illustration of the attempts of the *Commission* to interfere in the already in-place networks of the market, and how the interactions between the different actors, from sellers to regulators, took place. There was no overwhelming show of authority here. Rather, there was a need to have someone on location, familiar with the region, and able to take the

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<sup>717</sup> Ibid, “s’il est donc possible que la commission royale accorde à negre le pere ce qu’il demande, elle fera un acte de justice en donnant à son fils une leçon de piété filiale qu’il paroît beaucoup trop méconnoître.”

<sup>718</sup> Correspondence from Negre the son to the *Commission*, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. “Je soussigné declare a mon pere que quoiqu’il ait bien voulu par sa bonté me faire mettre le nouveau Brevet pour les eaux minerales a mon nom, il sera toujours le maitre absolu pour la vente et achats dedites eaux et tout comme auparavant sans que je ne puisse prevaloir ny en justice ny par quel pretexte que ce soit.”

<sup>719</sup> Correspondence from Fouquet to the *Commission*, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. “Ce n’a pas été sans peine que je suis parvenu à concilier les deux partis fort irrités fort piqués l’un contre l’autre ; mais enfin j’y ai réussi malgré le caractere violent d’un proche parent de l’un d’eux.”

<sup>720</sup> Ibid, “je vous serai très obligé en mon particulier, Monsieur, de les faire traiter avec quelque douceur au Greffe de la commission, pour les frais de l’enregistrement de l’act”.

<sup>721</sup> Correspondence from the *Commission* to Fouquet, 107e assemblée, (6<sup>th</sup> July 1778), SRM 113, dossier 17, ASRM. “rien de si sage, en effet que le parti que vous avés pris à cet égard ; vous prévenés des dissensions et une espèce de petite guerre civile qui seroit résultée infailliblement”.

<sup>722</sup> Minutes of the *Société*, on the sending of Negre’s permit, (1778), SRM 90B, dossier 25, ASRM.

time to understand the different sides of the story. In this case, the inspector could fulfil that role, and the *Commission* trusted his judgment.

It was also clear in this case that the legislations could sometimes be bent to the convenience of a particular situation, as can be seen with the demand of ‘softening’ the cost of registration. Empathy, compromise and efforts to disentangle conflict situations were surprisingly important factors in the supervision of the market. This case was not unique in that sense. Resolving relationship issues was part of any administration. A head of a university, a town parliament, or a local blacksmith all had to ensure smooth relations with colleagues, constituents, or clients. But inspectors and intendants working with waters spent the majority of their time solving human relations problems.

Overall, the efforts of the *Société* could be summarised almost entirely as them producing a code of law, and then arguing for its legitimacy with every single person that it applied to. In these negotiations of legitimacy, the important parts of the law really came through. The Sommières case showed that the moral aspects of the legislation were more than a mere varnish. Punishing a disrespectful son was seen as worthy of altering a previously established permit. The importance of keeping prices fixed however, was no matter for arguing.

## Inapplicably strict rules

Some of the difficulties that the *Société* encountered in its mission to administer the market of mineral waters came from miscommunication and ignorance of the rules, rather than active malice. A common occurrence in the correspondence was the tale of an inspector going to a spa town, and reporting on the thousands of small problems that he saw there. Raulin travelled to several spas in the early years of the *Commission*, and came home with tales of terrible mismanagement.<sup>723</sup> Often however, he explained that the intendants he had met with were simply guilty of naivety or ignorance, rather than overtly opposing the *Commission’s* guidelines.<sup>724</sup>

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<sup>723</sup> See an example of this in the following document, in which the intendant, following a description of the poor conditions of the spring, promised to address all issues and to move to the town in question, so as to be able to watch it closely. “Extrait de l’analyse de trois sources thermales de Bains de Rennes en Languedoc par M Soutere”, 102e assemblée, (9<sup>th</sup> March 1778), SRM 113, dossier 12, ASRM. In another example, an analyst started his report by describing the numerous issues encountered by the local hospital. He asked for help for the poor and the sick who were not getting proper care because of local mismanagement. Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM.

<sup>724</sup> He talked about the case of Bigorre for example, describing how the owner of the waters had managed to convince the intendant to delegate the authority on the waters to the municipal officers. The intendant thought that this was the best option, but this decision led to chaos at the spring. Raulin explained this by saying that the owner had found a way to “fault the religion of Mr the Intendant of the Province”, thus implying that the intendant was only guilty of naivety, and not a willing opponent of the authority of the *Commission*. Délibérations de la Commission,

These issues reoccurred because the standards of the *Commission* and of the *Société* were not always realistic. The *Société* tried to impose a strict control over the waters from physicians (and chemists), but it made little space in positions of power for apothecaries and surgeons. In a number of provinces however, there were simply no physicians to speak of, and in response, surgeons had to step up to that much-needed role. They often illegally provided diagnosis. Apothecaries were in similar positions. They were known to overstep their roles as remedy mixers and would effectively prescribe medicine to patients, or recommended particular mineral waters to drink.

The bias towards physicians was the product of a form of medical elitism. Most apothecaries believed themselves competent to manage and occasionally prescribe mineral waters. As an illustration of this confidence, a pharmacist expressed in 1783 that a water he knew of was horribly mismanaged by their current owner, a goldsmith with no medical background. Under his care, the water were polluted by a residue, which left “a sort of foam which makes them disgusting”.<sup>725</sup> He expressed that under his care, and thanks to his knowledge as an apothecary, such a thing would never happen.

When the *Commission* was replaced by the *Société*, the First surgeon expressed concerns over the state of the medical field in the provinces. He claimed that in most of the country, eighteen out of twenty medical cases were handled by surgeons rather than physicians. This precise statistic perhaps alluded to some prior survey conducted by the First surgeon. Regardless of the exact ratio, denying surgeons the right to have a say on the distribution of mineral waters would be impractical. The *Société* was not swayed though. An Associate responded that even in this dire case, allowing the surgeons to prescribe remedies against the prerogatives of their branch would be treating “an abuse with another abuse”.<sup>726</sup> So the surgeons were yet again denied rights to extend their medical authority. This did not mean that they stopped prescribing remedies, it only meant that they had to continue doing it illegally. Issues regarding the rights of surgeons, apothecaries and physicians continued to appear in the years of the *Société*'s control. An example from 1783 describes waters which were “ordered” by apothecaries, surgeons, and midwives, showing the endurance of the practice, despite the *Société*'s inflexibility.<sup>727</sup>

### *Handling financial difficulties*

The scientific standard was not the only one to be challenged by the realities of the market, the waters, and the actors involved with it. Some of the owners

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(1778), Dossier 345, BIU. “trouvé le moyen de surprendre la religion de M. l'Intendant de la Province”.

<sup>725</sup> Correspondence from Lagarde to the *Société*, (8<sup>th</sup> October 1783), SRM 95 dossier 1, pièce 91, ASRM. “une espèce de mousse qui les rend degouttantes”.

<sup>726</sup> “Réflexions et réponses au premier chirurgien du roi sur l'arrêt du conseil du 5 mars 1781”, SRM 114A–B, dossier 13, ASRM. “traiter un abus par un autre abus”.

<sup>727</sup> Correspondence from Bossin to the *Société*, at the Mont d'Or, (1783), SRM 90 A, dossier 4, ASRM. Ces eaux sont “ordonnées” par des apothicaires, des chirurgiens et des femmes sages.

of waters expressed mild but persistent pushback against the monetary policy of the *Société*. Most did so without bothering to inform the *Société* that they were changing their prices. As early as 1777, Le Veillard, the above-mentioned owner of the waters of Enghien, argued directly for what he saw as his right to set his own prices. He explained:

the natural value of an already known product is that which the public gives it in the places where it is sold; if the water of Enghien is similar to that of Barèges, Cauterets etc the owner is all the more in his right to demand the same price;<sup>728</sup>

Le Veillard appealed against the supposed charitable mission that all mineral water owners were supposed to uphold. He openly stated that since the waters were his possession, and the waters were a commodity sold on a market, this alone should dictate the price that he decided to set for his property, since “a landlord has the right to profit from the place of his possession”.<sup>729</sup> He also argued against the obligation of using licensed transporters for his waters, against his wishes to use whichever personnel he already had a relationship with. He concluded that such a system could be dangerous, should it fall under worse command than that of the *Commission*. This bit of unconvincing flattery did not hide the much more transparent plea for the freedom of landlords to benefit from the waters they happened to own, without regulation from royal institutions.

Other issues concerning the economics of managing waters were directly related to poverty. Many towns struggled to foot the many bills generated by the use of their waters. Having to keep the facilities in good shape, hosting visitors, financing hospitals, all were expensive. Even Vichy went through periods of financial difficulty. The small community of Laruns was an example of this. The municipality owned a spring in its ground, and decided to start construction on a series of new buildings in 1776, with the intent of better utilising the water. The construction however, turned out much more expensive than the municipality had been initially billed for. By 1785, once the construction was finished, the entrepreneur who had contracted the work demanded payment. The town had to resort to borrowing more money from the state in order to pay its outstanding debt.<sup>730</sup>

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<sup>728</sup> Correspondence from le Veillard to the *Commission*, 91<sup>e</sup> assemblée, (5<sup>th</sup> May 1777), SRM 113, dossier 1, ASRM. “la valeur naturelle d'une denrée déjà connue est celle que le public lui donne dans les lieux où elle se vend; si l'eau d'Angien est semblable à celle de Barèges, Cauterets etc le propriétaire a d'autant plus le droit d'en exiger le même prix; qu'elles seront plus fraîches, plus souvent renouvelées, par conséquent plus salutaires et qu'il est évident que le public est en état de donner pour l'eau d'Angien ce qu'il paye pour celles de Barèges”.

<sup>729</sup> Ibid, “un propriétaire a droit de profiter du lieu de sa possession”.

<sup>730</sup> Documents concernant le Béarn, Envoi du projet d'arrêt du conseil concernant l'emprunt de la communauté de Laruns, propriétaire des sources chaudes de la vallée de d'ossau. Extrait du brevet des Etats Généraux des pays du Béarn, (1785), H//86, AN.

Financial struggle could also be faced by the inspectors and intendants. The position did not always come with free lodging. Because of this, several intendants did not live in the town where the water itself sprung, because these towns were too small to sustain their physician's practice. This however, led to issues, as there was no figure of authority in the town to ensure a good following of the rules. This was the case in Saint Alban. In an analysis sent to the *Société*, the author explained that because of local laws, the lord of the land received all profit on the waters, and the intendant could receive none of it, including a right to lodging. He therefore could not afford to live on location.<sup>731</sup>

Bureau tenants frequently had revenue shortages too. A few examples of this have already been described in chapter two. When their financial woes limited their ability to pay their dues to the *Société*, this was highly problematic to the Associates. This happened to the director Dorliac in Toulouse in 1780. The *Société* at the time wanted to increase the price of his fees. Dorliac explained that he was too inconvenienced by taxes at the moment to be able to withstand a rise in price.<sup>732</sup> The *Société* accepted to prolong his permit without the raise for a time. Over the next years, Dorliac asked for his fees to be reduced a few different times, citing the number of frauds and illegal transporters who hurt his business. This carried on until the revolution. In 1789, Dorliac also blamed the revolutionary unrest and lack of policing for having allowed many of his competition to gain an advantage of him and lessen his profit further.<sup>733</sup>

#### *The limits of the privileges system*

The *Commission* and the *Société's* jurisdiction was not infinite. Since the market of mineral water extended beyond the borders of France, the mismatch in legislations caused issues regarding transport. The most telling case of this were the troubles of the distributor of mineral waters in Metz, a city in the north-east of France. He explained that in his town, the buyers were mostly interested in foreign waters, mostly from Spa, Sedlitz and other German springs. He could not understand why his permit did not apply to foreign regions, and restated multiple times "there is no permit for a director of a bureau of mineral water that would not be exclusive both for foreign waters and for those of the kingdom".<sup>734</sup> Since he mostly sold foreign waters, an exclusive

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<sup>731</sup> Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

<sup>732</sup> Correspondence from Dorliac to the *Société*, (1780), SRM 93 A, dossier 6, ASRM.

<sup>733</sup> Correspondence from Dorliac to the *Société*, (1789), SRM 93 A, dossier 6, ASRM. "Depuis la révolution, beaucoup de personnes dans diverses villes vendent les eaux minérales en concurrence avec les distributeurs privilégiés, ce qui met ceux ci dans l'impossibilité de payer leurs revedances."

<sup>734</sup> Correspondence from the distributor in Metz to the *Commission*, 72<sup>e</sup> assemblée, (26<sup>th</sup> February 1776), SRM 112, dossier 1, ASRM. "il n'est pas de brevet de directeur du bureau d'eaux minérales qui ne soit exclusif tant pour les eaux étrangères que pour celles du royaume".

privilege on selling only French waters would be worthless to him. His main issue were the boatmen and women who kept importing waters into the town despite his privilege. He involved the police multiple times and had them search the boats of at least two different individuals. Hundreds of bottles of mineral waters were found in both cases. Boatman Fasbender was found to carry 850 bottles on his boat, and boatwoman Lautrebourg regularly brought waters in town, according to the many letters from the distributor. When her boat was searched, 800 jugs were found in her possession.<sup>735</sup> In a later letter, it appears that the two worked together to bring the bottles in Metz.<sup>736</sup> The distributor also tried to fight the practice of several residents of the town who ordered private transporters to bring the waters to them directly. All of these people claimed to ignore the law when confronted, which made his work very difficult.<sup>737</sup>

This type of case highlights the inherent limitations of the privilege system championed by the *Société*. By making bureau tenants pay for their right to distribute waters, the *Société* had to convince them that the privilege they received in exchange for the fee was worth its price, and that the monopoly they were entitled to would ultimately lead to higher profits for them. This however fell apart when the privilege was not respected. In those cases, the bureau tenant ended up with the worst possible deal. They had to pay for a meaningless privilege that all could breach in impunity. This made their frustration with the *Société's* strict rules more explainable. In the case of foreign waters, the issue could simply not be resolved by employing further legislation. The *Société* could have considered forbidding the sale of foreign waters outright, but this would have been incredibly unpopular when the patients clearly favoured them. Such unresolvable conundrums led to some relaxing of the rules from the *Société* over the years.

The case of Chifoliau was quite representative of this growing discouragement. Chifoliau, a physician and chemist in Brittany, was clearly a very enthusiastic participant in the market of mineral waters. He wrote many analyses for which he was praised. He also had ambitions of bringing order to the sale of waters in his region. In his correspondence with the *Société*, he complained about the issues he saw, stating that his work would be made easier if he were made intendant of that region.<sup>738</sup> But despite his enthusiasm, the *Société* appears to have responded rather sporadically. Chifoliau had to write several

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<sup>735</sup> Ibid, “La nommée Lautrebourg Batteliere de treves ayant conduit sur ses batteaux la quantité de huit cent cruchons d'Eaux mineralles en cette ville”.

<sup>736</sup> Ibid, “Demoiselle Zauterbourg batterliere de treve nous a fait reporte que cetoit elle qui les y avois amené pour le compte du Sr Jean Fasbinder aussi battelier du dit treve”.

<sup>737</sup> Ibid, “differens particuliers feignent d'en méconnoitre les dispositions, et sous ce pretexte font confuire en cette ville des eaux mineralles dont il font commerce sans observer aucune des formalités prescrites par laloy”.

<sup>738</sup> Correspondence from Chifoliau to the *Société*, (1781), SRM 92B, dossier 36, ASRM. “L'acceuil flatteur qu'elle a accordé a mes premieres analyses, enhardit mon zèle et me fait esperer quelle daignera jeter un regard sur celle cy.”

times before he was granted his title. He then had to prompt the Associates on multiple occasions to be sent an official seal, so that the waters could be stamped appropriately.<sup>739</sup> In 1783, after describing the fraudulent market in the town of Saint Malo, he expressed to the *Société* his ambition to have a bureau there. He seemingly put a lot of work in planning and managed to convince the judges of the town that such a bureau would be necessary so that the public would no longer be “drinking pure water as medicinal water.”<sup>740</sup> He even set a price list and sought out a locale for the new bureau. But the *Société* responded that per their regulations, Saint Malo was too close to the city of Nantes, which already had a bureau, and Chifoliau’s proposition was thus turned down without further discussion.<sup>741</sup>

By 1783, after a mere seven years of existence, the *Société* had already lost some of its initial diligence, in the face of legal challenges that were sometimes too great to overcome. But while the consequences for the *Société* were a potential loss in one half of its overall revenue, for the actors in the market, a more significant part of their livelihood was at stake. This explains why some of the intendant, bureau tenants, apothecaries and surgeons might have felt empowered to, at times, disregard its legislation. The stakes were simply too high, and following the rules to the letter brought them too few advantages to justify the difficulties that they would incur for being rule-obeying to a fault.

## Revolutionary demise of the *Société*: the end of centralised control (1789–1793)

The authority of the *Société* was not everlasting. As it had been created by state incentive, and funded in part by the state, the 1789 French revolution was bound to throw a wrench in its operation. No changes were made immediately after the storming of the Bastille, but as the revolutionary movement continued, the *Société* was forced to react and adapt to the new political landscape. These attempted modifications, which were the result of external circumstances rather than internal wishes, show a continuity with the *Société* unyielding attitudes towards some of its fundamental principles.

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<sup>739</sup> Correspondence from Chifoliau to the *Société*, (1783), SRM 92B, dossier 36, ASRM.

<sup>740</sup> Ibid, “j’ai éprouvé quelques difficultés; mais enfin je suis parvenu a demontrer a nos juges la necessité d’un pareil établissement. le public ne sera plus comme cy devant, exposé a des sophistications, il ne boira plus de l’eau pure pour de l’eau medicinale.”

<sup>741</sup> The *Société* indicated that creating a bureau in Saint Malo would compete with the one already established in Nantes. Note on the correspondence from Chifoliau to the *Société*, (1783), SRM 92B, dossier 36, ASRM. This happened in other cases in which the *Société* denied the establishment of a new bureau because of the proximity to another one. See: Note by a *Société* Associate on the correspondence from the Vivarais, SRM 93A, dossier 7, ASRM.

### *Making amends with the Faculty*

Rather unexpectedly, a project was put together, with the aim of uniting the Faculty and the *Société*. After years of vitriolic exchanges, followed by obstinate silence, the events of the revolution forced the old enemies to attempt working together in order to avoid eradication.<sup>742</sup> This project was taken to surprising lengths. There appears to have been a genuine effort on both sides to write what would be the foundational documents of a united enterprise, and a real reflexion on which principles should govern its operation and its structure. That being said, the original conflict between the Faculty and the *Société* had taken place a mere eleven years prior and was therefore still fresh in the minds. Despite the urgency, the unification was described as a “delicate” topic,<sup>743</sup> as shown by the sheer number of rewrites and different hands that can be found taking part in the document’s many drafts. Both the Faculty and the *Société* made conscious yet inconsistent efforts not to mention their conflictual past, alluding to them in euphemistic phrases, such as “a fatality of which we will avoid searching for a cause has rendered unsuccessful those steps that the faculty of medicine and the *Société* have made to get closer”.<sup>744</sup>

The hopes of the unification actually working were not high. The draft of the plan stated that the entire endeavour was probably hopeless, as the Faculty was irremediably opposed to change. Some other parts of the document were oddly revisionist concerning the events of the altercation, stating for example that the only criticism made against the *Société* was that it had been formed outside of the Faculty’s jurisdiction, when the Faculty had in fact detailed many more objections to the creation of the *Société*.

In the pursuit of reconciliation, the document listed several points of antagonism between the two institutes that would need to be addressed if the reunion was to ever take place. Three of those points concerned problems regarding state intervention and the independence of administration, the fourth concerned the issue of only admitting physicians at the Faculty, and the possibility of having non physicians Associates. The author after listing these points, expressed that a full merging of the two institutions was perhaps not necessary. If they simply managed to get closer, negotiation with the new revolutionary state would already be made a little easier.

In 1790, a new draft was written, alleging that from the point of view of some *Société* Associates, the conflict with the Faculty was regrettable, and that in particular, the Associates Lorry, Jussieu and the First physician

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<sup>742</sup> For a full rundown of the conflict between the *Société* and the Faculty (1778–1779), see Chapter 3.

<sup>743</sup> *Projet de conciliation avec la faculté*, (1789–1790), SRM 114A–B, dossier 11, ASRM. “C’est ici que la discussion commencée devient délicate”.

<sup>744</sup> *Projet de conciliation avec la faculté*, “Sur les moiens de réunion entre la faculté et la *Société* Royale de médecine”, (1789–1790), SRM 114 A–B, dossier 11, ASRM. “une fatalité dont nous éviterons de rechercher la cause a rendu infructueuse ces démarches que la faculté de médecine et la *Société* ont faites pour se rapprocher.”

Lassone had worked as early as 1782 on a reconciliation project.<sup>745</sup> This text, meant to be sent to the Faculty, still reminded the Dean of his unjust denying of the title of *Docteur-régent* to four of its members.<sup>746</sup> The text claimed that the only reason as to why the *Société* never disputed this was to save the Faculty from public embarrassment. This kind of jab shows that, if a reconciliation were to ever happen, some of the old points of conflict had to be resolved.

The Faculty also made a proposal for the reunification of the two institutes which essentially boiled down to keeping the Faculty exactly as it was, and simply integrating the *Société* under its command, as long as all *Société* members held Faculty titles. This would mean stripping the *Société* of its Academic structure. More discussions ensued, debates on which building could host both institutes, or whether having the Dean as the head of the *Société* would equate having a spy rather than a colleague in its ranks.<sup>747</sup>

The very last document in the folder on the *Société's* side was however more sombre in tone. Despite the attempt, the reconciliation had turned out to be impossible. Lorry, following many unsuccessful discussions with the Faculty, wrote to a fellow Associate, warning him “do not count on the dean who is honest but very stupid”.<sup>748</sup> He then wrote about the many insults that he received for daring to bring up the subject of reconciliation, and of his great sadness of not being supported by the government in this difficult case. He closed his letter stating he was “sorry to be giving such news, but it is necessary.”<sup>749</sup> Even in dire times, the *Société* and the Faculty could not settle old conflicts, and they remained stubborn enemies to the very end.

### *The final years*

These documents of conciliation showcase the mindset of the *Société* at the dawn of the revolution. The insistence on the need of the *Société* to remain collegial restated its belief in the success of the academic model. It reaffirmed however its need of maintaining good relations with the state, in order to keep its contacts abroad, and to support its legislative endeavours.

This need for close relations with powerful government figures turned out to be problematic. In the process of writing these articles of conciliation,

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<sup>745</sup> Texte à copier dans le plunitif, (January 1790), SRM 114A–B, pièce 10, ASRM.

<sup>746</sup> Halle, Fourcroy, Guérence and Chambon were all meant to receive their title as the altercation took place, and as they chose to remain at the *Société*, they were barred from attending any meetings at the Faculty, and therefore from graduating. Texte à copier dans le plunitif, (January 1790), SRM 114A–B, pièce 10, ASRM.

<sup>747</sup> Many more arguments were also made in an attempt to keep the members who did not graduate from the Faculty. A suggestion was made to name them “physicists” rather than non-physicians, as the term was less derogatory, citing the number of well-respected chemists and naturalist members whose expertise would be better recognised by such a title. “Projet de conciliation avec la faculté”, (1789–1790), SRM 114A–B, dossier 11, pièce 18, ASRM. “associés libres physiciens”.

<sup>748</sup> Correspondence from Lorry, *Projet de conciliation avec la faculté*, (1789–1790), SRM 114A–B, dossier 11, ASRM. “ne comptés pas sur le doyen qui est très honnête mais bête”.

<sup>749</sup> *Ibid*, “désolé de devoir donner de telles nouvelles, mais qu’il le faut.”

someone at the *Société* probably had the right idea in crossing out the part that mentioned the importance of having members of high rank, meaning of the nobility, as Associates.<sup>750</sup> Although this had been the explicit mindset thus far, the members clearly had some trouble in adapting to the new political reality of their time.

A letter was written by the *Société* to the physicians who sieged in the new judiciary body called the Assemblée Législative. The wording they used showed a willingness to embrace revolutionary ideals. The author mentioned being honoured to see so many of his colleagues called to such a high assembly. He then asked them for some help and support for the *Société*, but also for direction. The *Société* was in the midst of reforming their internal structure, they needed suggestions on how to best transition into the new political scene. The open letter invited all physicians and, in a newly found spirit of medical equality, surgeons too, to attend the discussions about the reform of the *Société*.

Medicine when suitably studied and practiced can become one of the most useful instruments of national Beneficence and it is in this aspect that it must attract the gaze of the representatives of a great People.<sup>751</sup>

The letter finished by indicating the time and place of the *Société*'s meetings and invited any interested readers to attend, urging them to participate to the debate. At the issue of these debates, yet another plan for the control of remedies was concocted, involving the creation of a tribunal for the surveillance of mineral waters. This institution was also meant to be able to dispatch people in order to analyse new waters and check the quality of remedies throughout the country.

This plan was, however, still quite pyramidal in its structure.<sup>752</sup> This was likely the damning issue with the *Société*'s attempts at internal change. The institution was by nature an emanation of the late *Ancien Régime*, too unyielding in its view of power to truly be able to adapt to the Republic. Its financing depended on structures that had just become defunct. All bureaus of distribution of mineral waters worked on a system of privileges, and following 1790, all privileges had been abolished, thus cutting the *Société* from half of its

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<sup>750</sup> Charge et revenus, traitement des membres, (1789–1792), SRM 114A–B, dossier 12, ASRM. “Les diverses académies de la Capitale ont bien senti ces avantages, et toujours désiré pour cette raison de s'associer des hommes d'un rang supérieur”.

<sup>751</sup> Lettre aux médecins de l'assemblée législative, Charge et revenus, traitement des membres, (1789–1792), SRM 114A–B, dossier 12, ASRM. “La medecine convenablement étudiée et pratiquée peut devenir un des instrumens les plus utiles de la Bienfaisance nationale et c'est dans cet aspect qu'elle doit fixer les regards des représentans d'un grand Peuple.”

<sup>752</sup> A study of its internal governance shows a similar conclusion. The institution only evolved forward by subdividing its existing structure into an ever-increasing number of branches, but it rarely questioned the legitimacy of the mother branches. It could therefore not easily be fundamentally changed.

revenue.<sup>753</sup> For a time, this was compensated by an increase in state funding, but quickly this became problematic too. Under the new regime, no one was supposed to receive annuity from the state. The *Société* tried to get around this by arguing that it was an institution, and the funds were therefore not privately handed out to individuals. But despite these efforts and workarounds, the state became increasingly suspicious of all state-funded institutions, especially when they had been created by the disgraced king. The *Société* had to answer for all spending, and in 1793 had to also justify why some of its members had left the country, being accused of allowing cowardly scientists to escape the Republic under the cover of scientific collections.<sup>754</sup> Only a couple of weeks later, a decree was proclaimed:

All academies and literary societies, patented or endowed by the nation are abolished.<sup>755</sup>

With this dry statement, the *Société*, the Academy of Sciences and the Faculty of medicine were all voided in a single gesture. The *Société* and its troubles belonged most certainly in the *Ancien Régime* at its peak, both in terms of ambition and celebration of progress, but also in the strict nature of its framework, and its incapacity to adapt to a radically different system. It is rather fitting that it ended with the end of absolute monarchy in France.

The revolution represented a definite break in the activities of the *Société*. Some of its former Associates were of noble origin, and a few met their end on the guillotine.<sup>756</sup> Others found spaces in the new medical institutions of the revolution. But it would not be until 1820 that a new institution would be made from the sketches left out by the *Société*. This new institution was to be named the Academy of Medicine, thus in a sense fulfilling the original intent of Pierre Chirac and of the *Société*, in dotting the medical world with its own Academy for the first time. This institution is still around today and claims to have been “Formed from the ancient scientific societies of the ancien régime”, to quote its current perpetual secretary.<sup>757</sup>

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<sup>753</sup> Charge et revenus, traitement des membres, (1792), SRM 114A–B, dossier 12, ASRM. “2° que le decret di 20 aoust 1790, supposans l’anéantissement de tous privilege en consequence des bureaux privilegiés d’eaux minerales, avoit assigné ci la société pour ses depenses non seulement la somme de 23200tt. deja verséee annuellement par le tresor royal, mais encore un supplément de 1300tt. pour tenir lieu du produit des eaux minerales.”

<sup>754</sup> Charge et revenus, traitement des membres, (23<sup>rd</sup> July 1793), SRM 114A–B, dossier 12, pièce 17, ASRM.

<sup>755</sup> Henri Grégoire, “Rapport et projet de décret, présenté au nom du Comité d’instruction publique, à la séance du 8 août,” (Paris, Imprimé par ordre de la Convention Nationale, 1793), 13. “Toutes les académies et sociétés littéraires, patentées ou dotées par la nation sont supprimées.”

<sup>756</sup> Lavoisier and the Duc de la Rochefoucauld are two notable examples.

<sup>757</sup> “Bicentenaire de l’Académie nationale de médecine : 1820–2020,” Académie Nationale de Médecine, 2020. <https://www.academie-medicine.fr/bicentenaire/?lang=en>. (Accessed August 2021). “Formée à partir des anciennes sociétés savantes d’ancien régime, l’Académie s’affirme

The Academy of Medicine upon its creation was not granted the superintendency over mineral waters however, meaning that the *Société* was truly the last institution to attempt a centralised control over mineral waters. Hanaway in her account of the institutional history of the *Société*, concludes from her work on the structure and inner-workings of the institute that it can be viewed as a prefiguration of post-revolutionary scientific institutions, with an emphasis on a young, progress-oriented institution, that challenges the traditional divisions of knowledge of the *Ancien Régime*. I would question this viewpoint to a certain degree. The *Société* was also very much a product of absolutism, one that viewed centralisation as the ideal method of governance.

## Rebuilding the pyramid? Ruling the waters after the revolution (1793–1810)

It goes without saying that the events of the Revolution, and the proclaimed end to all Academies, were not made with the explicit intent of harming or helping the trade of mineral waters. This was simply one of the many consequences of the change in government. And despite the legislative void left by the disbanded *Société*, the waters still flowed, in Passy, Vals or Vichy. And in the new French Republic, people still got sick, and among those, after the dust had settled, some still wanted to drink mineral waters in order to be cured. So, what happened to the market of waters during and after the revolution? With no superintendency or First physician to speak of, there was an opportunity to rebuild the legislation over mineral waters from the ground up. This opportunity was taken by the new ministers, who were aware that in the aftermath of the revolution, in “several of the counties where springs and fountains of mineral waters are situated, the old rules relative to them are entirely forgotten and without relevance”.<sup>758</sup>

### *An initial strong continuity in the principles of administration*

In the An VI (1797–1798), a report was made stating that the “mineral waters of the Republic” were “a gift from nature”, as well as among the “public resources”. This warranted the nomination by the state of “officers of health necessary to their service and their inspection.”<sup>759</sup> The ministry in charge of

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dès l'origine comme l'interlocuteur privilégié, le conseiller et l'instance de réflexion et de délibération au service des pouvoirs publics et du gouvernement en matière de santé.”

<sup>758</sup> Administration des eaux minérales en période révolutionnaire. (An VII), dossier 332, 2, BIU. “Le directoire exécutif, ouï le rapport du Ministre de l'intérieur ; considérant que dans plusieurs des cantons où sont situées des sources et fontaines d'eaux minérales, les anciens règlements y relatifs sont entièrement oubliés et sans vigueur;”.

<sup>759</sup> Correspondence from the minister of the interior to the *École*, (An VI), AJ/16/6697, AN. “Citoyens, j'ai rendu compte au Directoire exécutif des vûes que vous avez soumises à mon prédécesseur sur les eaux minérales de la République. il vient de prendre un arrêté qui en la considérant comme don de la nature et faisant partie des ressources publiques détermine quelles

health therefore attempted to put together a new draft of laws, stating that mineral waters “have always been and must always be subjected to particular measures”, and that their belonging to the realm of pharmaceuticals had been proven by “evidence and the sequence of uninterrupted laws given in that regard.”<sup>760</sup> After acknowledging the lengthy history of attempted legislation, the minister wrote his proposal for an updated version of the regulations on mineral waters, suited to France’s new regime.

His plan first concerned logistics. He wished to see the sellers of waters keep their books, perform an annual inventory, and open new shipments of bottles under the careful watch of a commissary in charge of inspection. Those rules followed the *Société* regulations almost to the letter. Another passage concerned the procedure to follow in case of discovery of a new spring:

Any landowner who discovers in their land a spring of mineral water, will be required to inform the Government so that it can have it examined; and following the report of the commissaries appointed to that effect, the distribution will be allowed or forbidden, in accordance with the judgment that has been carried.<sup>761</sup>

This kind of regulation suggested no immediate movement towards a more fluid market, and in fact very much reiterated the top-down structure of expertise of previous decades. The minister also mentioned the possibility of opening new places for citizens to buy their waters. He suggested potentially allowing civil hospices to sell waters, so as to give them an additional source of revenue. But a document from a few years later mentioned that according to the law that had been proclaimed in the An VII (1799–1800), mineral waters could only be sold at the spring, or in bureaus of distribution of waters.<sup>762</sup>

Generally speaking, the ways of using the waters did not change drastically before and after the revolution. In the decades of 1790s and 1800s, mineral waters were still being consumed as remedies, and springs fell in and out of fashion, as they had before. Some familiar waters remained just as popular in post-revolutionary France, like the springs of Vichy, Cransac, Barèges or

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sont les autorités qui doivent connoître de leur administration et Police et par qui doivent être nommés les officiers de santé nécessaires à leur service et à leur inspection.”

<sup>760</sup> Ibid, “Maintenant, si on ne peut douter que les eaux minérales ne soient comprises dans la classe des médicamens; qu’étant sujettes à des mixtions et falsifications, elles ont été et doivent être toujours soumises à des mesures particulières comme les autres parties du commerce des drogues, on ne pourra méconnaître que le décret conservateur des formes protectrices du commerce de la pharmacie soit également applicable au débit et à la vente des eaux minérales : or, c’est ce que prouvent également l’évidence et la suite non interrompue des lois rendues à cet égard.”

<sup>761</sup> Ibid, “Tout propriétaire qui découvrira dans son terrain une source d’eau minérale, sera tenu d’en instruire le Gouvernement pour qu’il en fasse faire l’examen ; et d’après le rapport des commissaires nommés à cet effet, la distribution en sera permise ou prohibée, suivant le jugement qui en aura été porté.”

<sup>762</sup> Correspondence from the minister of the interior to the *École*, n° 100, (An 8), AJ/16/6697, AN.

Plombières. There were also plenty of newcomers. The waters of the Mont d'Or became much more widely known, and some newly discovered springs entered the market like those of La Roche Posay, Encausse or Castera.<sup>763</sup> The waters themselves were still being used to heal the public, and the charitable missions had also been conserved.<sup>764</sup> According to a census done in Bagnères-de-Luchon in 1811, 822 civilians, forty military and 168 poor had been treated during that year at the hospital.<sup>765</sup>

The principal time-consuming activity of legislators in the following decades was to review, discuss, and approve or disapprove of new legislation concerning individual towns. Often, the ministry sent these proposed new rules to the *École de Santé*, who would lend its medical expertise to the minister. These exchanges between the *École* and the minister have been preserved, and they showed a quickly forming pattern. The earliest example I have witnessed came from the An II (1793–1794), in which the minister “asks the *École* for its opinion on a ruling made by the prefect of the Vosges, relative to the administration of the Waters of Plombières”.<sup>766</sup> The *École* studied the proposed ruling, and after deliberation, responded: “the measures indicated by the Prefect must be approved, because they seem to us able to contribute to and ensure good order, cleanliness, and a good administration of the Waters in question”.<sup>767</sup> The *École* also made a comment on the proposed list of prices for the waters, stating that the prices chosen were very “moderate”, and “within reach of the monetary faculties of those who frequent the Waters.”<sup>768</sup>

This habit of spa towns sending in their new regulation for approval continued as the years went by. In the An IX (1800–1801), Deyeux and Le Roux, both members of the *École*, explained that for a long time, the minister had received many memoirs and letters on the subject on mineral waters: “some have for object the question related to the right of property, in others, one complains about the non-application of the rulings, several also present their

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<sup>763</sup> Les Mines, Tourbières, salines, eaux minérales, Recensement par département des sources et du médecin inspecteur attitré, (ca. 1810), F/14/1309, AN.

<sup>764</sup> It would not be until the late nineteenth century that the poor would become almost entirely removed from the public of spa towns, amidst moral and economic concerns. Faure, “Aux marges de la médecine. Santé et souci de soi. France XIXe siècle.”

<sup>765</sup> Mineral waters of Bagnères de Luchon, “Observations réunies sur les personnes de tout sexe qui ont fait usage des eaux minérales de bagnères de luchon avec l'analyse des maladies qui se sont présentées les divers traitemens qu'elles ont subi et le résultat qui a été obtenu”, (1811), AJ/16/6697, AN.

<sup>766</sup> “Rapport sur une lettre du ministre de l'intérieur dans la quelle il demande à l'Ecole son avis sur un règlement fait par le préfet des vosges, relativement à l'administration des Eaux de Plombières et de bains”, (An II), AJ/16/930/A, N°266, AN.

<sup>767</sup> Ibid, “les mesures indiquées par le Prefet doivent etre approuvées, par ce qu'elles nous paroissent pouvoir contribuer et assurer le bon ordre, la salubrité, et la bonne administration des Eaux dont il s'agit”.

<sup>768</sup> Ibid, “le tarif annexé à ces reglements et dans lequel se trouvent consignées des sommes qui devront être payées par chaque malade suivant la maniere dont il usera des Eaux, nous parroit aussi devoir être adopté, attend que les prix y etant très moderés, ils sont à la portée des facultés pécuniaires de ceux qui frequentent les Eaux.”

views on the improvements which need to be done to certify the virtues of mineral Waters”.<sup>769</sup> In plain terms, this meant that the minister received complaints of fraud, letters asking for funds, discussions of legislation and chemical analyses or medical memoirs. In the face of this large body of documents sent to the *École*, they had to resolve to the creation of a small commission specialised in the question of mineral waters.<sup>770</sup> Old habits died hard.

And so this new, revolutionary commission, was put to work. The same year, they approved a report on the fixing of prices in Barèges. This administration was, much like the previous one, interested in limiting over-profiteering on the waters, and therefore also encouraged price fixing.<sup>771</sup> At the same time, a lot of the towns argued that since the last price fixing of the *Société*, the cost of labour had increased, and the cost of the waters had not followed, thus necessitating increases since pre-revolutionary days. The *École* had to make sure that these increases were not too dramatic.<sup>772</sup> In some cases, the *École* suggested which prices could potentially be lowered. All prices were of course in the new revolutionary currency of the *Francs*, divided in *décimes* and *centimes*, which was also the reason why all price lists had to be redrawn.<sup>773</sup> Similarly, all units had been converted into the brand-new metric system, meaning that prices of transported waters had to be given in *francs* per liter, rather than *livres* per regional pint.<sup>774</sup>

The town of Bagnères sent its new price list in the An X (1801–1802). A liter of water at the spring cost 5 *centimes*, and a transported one-liter bottle cost two *décimes* (or 20 cents of a *franc*). In this case, the *École* made suggestions of potential price reductions. They suggested for example that an hour in the shower be lowered from one *franc* to 75 *centimes*.<sup>775</sup> This appears to be a theme in many price list comments. The *École* often suggested that the

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<sup>769</sup> Report by Deyeux and le Roux on the memoir on the valley of Lauben, (An IX), AJ/16/6697, AN. “Depuis long-temps le ministre de l’intérieur recoit, tous de la part de quelques autorités constituées, que de celle de différents particuliers des mémoires et des observations sur les Eaux minérales. parmi ces mémoires, les uns ont pour objet la question relative au droit de propriété, dans les autres on se plaint de l’inexécution des réglemens, plusieurs enfin présentent des vûes sur les amméliorations qu’il conviendrait de faire pour constater les vertus des Eaux minérales et faciliter aux malades le soulagement qu’ils attendent de l’emploi d’un semblable remede.”

<sup>770</sup> “Rapport sur différens mémoires relatifs aux eaux minérales”, (An X), AJ/16/6698, AN.

<sup>771</sup> Report on the prices of Bagnères, (An X), AJ/16/6698, n° 271, AN.

<sup>772</sup> Report on the prices of Bagnères, (An XII), AJ/16/6698, n° 335, AN.

<sup>773</sup> See Appendix n°[10] on eighteenth-century currencies.

<sup>774</sup> In some cases, the sudden change in measuring systems caused issues and encountered resistance. On the implementation of the metric system, see: Suzanne Débarbat and Antonio E Ten, eds., *Mètre et système métrique* (Paris, Valencia: Universitat de València, 1993).; Jean Dhombres, “Résistances et adaptation du monde paysan au système métrique issu de la Révolution : les indices d’évolution d’une culture de la quantification,” *Annales de Bretagne et des pays de l’Ouest* 100, no. 4 (1993).; Witold Kula, *Les Mesures et les hommes*, trans. Joanna Ritt (Paris: Éditions de la Maison des sciences de l’homme, 1984).

<sup>775</sup> Report on the prices of Bagnères, (An X), AJ/16/6698, n° 271, AN.

diminutions be made in the town, rather than on the prices of transported waters which were already as low as could be.<sup>776</sup>

Many other towns sent their prices in this fashion, as they needed the approval of the minister in order to be allowed to sell their waters.<sup>777</sup> The *École* also gave comments on the proposed rules of conduct at the spring.<sup>778</sup> They suggested for example that the town of Bourbon Larchambault should hire an assistant physician inspector, so that the patients would not be left to their own devices if the principal physician inspector happened to be away for legitimate reasons.<sup>779</sup> For the waters of Laloue, they approved the proposed plan of separating contagious from non-contagious patients. They also encouraged the more moralistic aspects of such rulings, like the proposal to separate sex-workers from other women.<sup>780</sup>

These methods of administration differed very little from the habits of the *Commission* and the *Société*. The power over administration of mineral waters, including the monetary, moral, legislative and chemical aspects, were once again left to physicians. Those physicians enacted a similar set of standards onto the market of mineral waters, prioritising low prices, a strong presence of local physicians and a moral conduct at the springs.

#### *Consequences of the French Revolution on spa towns*

The problems the *École* faced were not entirely dissimilar from the long-standing issues of the *Ancien Régime* administration. A confused letter sent by the citizen Gastel, intendant at the waters of Luxeuil, to the minister showed a familiar issue: that of an intendant who was not sure who he was reporting to, and who also wondered why he had to send his qualifications as a mineral water intendant yet another time.<sup>781</sup> Similarly, as late as 1810, the debate regarding the branches of medicine and which should be granted authority on the ways to take mineral waters was not fully settled, and surgeons still regularly asked to be given authority in the matter.<sup>782</sup>

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<sup>776</sup> Report by Deyeux on the price of the waters of Bourbon Larchambault, (Messidor An XI), AJ/16/930/A, 11, N°271, AN.

<sup>777</sup> More examples of this approval process, see: Report on the price of the waters of the Rhin and Moselle, (An XII), AJ/16/6698, AN.; Report on the auction of the waters of Encausse, (An XIII), AJ/16/6698, AN.; Report by Deyeux on the waters of St Sauveur, Cauterets and Bagnères, (1810), AJ/16/930/B, n°805, AN. “monsieur le préfet pense qu'il conviendrait non pas d'augmenter le prix des Bains que les personnes peu fortunées vont prendre dans des barques et dans des baignoires de bois, mais bien celui des Bains pris dans des cabinets et des Baignoires de marbre. monsieur le préfet ajoute que l'augmentation qu'il propose n'atteignant que les personnes aisées, et dont est d'ailleurs très modérée, elle pourra facilement être supportée par elles”.

<sup>778</sup> See an example in: Report on the price of the waters of Luxeuil, (An XIII), AJ/16/6698, AN.

<sup>779</sup> Report on the rules at the town of Bourbon Larchambault, (An XII), AJ/16/6698, AN.

<sup>780</sup> Report by the inspector on the waters of la Maloüe, (1809), AJ/16/6697, n°757, AN.

<sup>781</sup> Correspondence from the officer of health Gastel to the minister of the interior, (undated), AJ/16/6697, AN.

<sup>782</sup> Report for the Faculty of medicine, on the selection of inspectors, (1810), AJ/16/930/B, 793, AN.

The events of the revolution had not been kind to all spa towns. As discussed in the second chapter, even the most prestigious waters sprung in towns which were not particularly rich. Given that, an interruption of the activity, even for just a few years, could be devastating. Besides, a part of the clientele of the spas were the rich and powerful, many of which were either busy turning their coats during the revolution, or running from the guillotine to neighbouring monarchies. In any case, Vichy could not expect the visit of the king's daughters to boost attendance to the town following 1789. As it were, Giraud the intendant of the mineral waters in Vichy at the time, died on the guillotine himself. While this was not a universal issue to all spa towns, there was a real disruption in the administration of waters everywhere.

A report on the waters of Aix in the An IX (1800–1801) confirmed this, by stating: “During the revolution the Waters of Aix have undergone the same fate as almost all public establishments being that their rules and administration have fallen into disuse [*désuétude*]”. The report went on to describe the numerous buildings that were not kept, the funds no longer collected, the fountains no longer cleaned.<sup>783</sup> The author of the report hoped that new stability in the region might lead to renewed interest in the local waters.

Another report, sent in 1806, described some of the other negative consequences of the revolution on the commerce of transported waters. The report explained the importance of transporting waters with caution, lest they lose all medical properties.<sup>784</sup> He added: “in the wake of the revolution, several individuals, without knowledge or habits in this part, have established deposits of those waters”.<sup>785</sup> These deposits, the author argued, were almost always full of waters which were either past-due, or artificial. He explained that since the revolution, all privileges had been “destroyed”, and instead of having only a small number of reliable sellers, anyone was in their right to take and sell waters wherever they pleased.<sup>786</sup> According to the notes on this report, the minister believed the issue was all the more reason why a general ruling on the mineral waters was urgent. He admitted that reinstating privileges was not an option, but he suggested that in the meantime, town physicians should visit all mineral water sellers accompanied by a police officer, and demand that all bureau tenants produce a list of the waters they sold.

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<sup>783</sup> Report on the waters of Aix, (An IX), AJ/16/6698, AN. “Pendant la révolution les Eaux Daix ont subi le même sort que presque tous les établissements publics c'est à dire que les règlements pour leur administration sont tombés en desuétude”.

<sup>784</sup> Report on petitions sent to the minister of the interior, (1806), AJ/16/930/A, n°493, AN. “s'il est bien certain que les Eaux minerales dont on fait usage à la source ont des propriétés médicinales, il est bien certain aussi que celles qu'on transporte dans les magasins ne doivent conserver leurs propriétés qu'autant que ceux qui débitent ces Eaux, prennent toutes les précautions nécessaires pour prévenir les alterations dont elles sont susceptibles.”

<sup>785</sup> Ibid, “par suite de la révolution, plusieurs individus, sans connoissance et sans habitude dans cette partie, ont établis des dépôts de ces mêmes eaux;”

<sup>786</sup> Ibid. Les privilège sont “détruits”. “cette garantie n'existe plus”.

*Adjustments in property law: a lasting change for the mineral water market*

There were striking similarities in the administration of mineral waters, before and after the revolution. And if little else had changed, it would not be difficult to imagine that, once the administrators and intendants had readjusted their rulings, price lists, and repaired the damage caused by neglect during the revolutionary years, the market of mineral waters might have continued much unchanged. But there was one major change, which represented a break in continuity from previous administration, which was the issue of property rights.

Mineral waters, especially the more famous ones, required facilities to be given to a large number of patients. The town had to provide baths, showers, and all sorts of other installations. This meant taking on a lot of debt, as all construction had to be paid in advance, in the hopes of future profit from visitors. Because of the large sums involved, a lot of waters belonged to either municipalities, or other large entities like the state. There were a few cases of individuals owning waters in the *Ancien Régime*, like the waters of Orléanas or Enghien which have been mentioned a few times. The post-revolutionary period was a time of rethinking the rights of landlords, and the conceptions of property. In consequence, many of the documents discussing mineral waters were in fact reflections and conflicts related to property over mineral waters. The fears which would feature in many of these discussions were that a private owner would alienate the healing virtues of the waters, and that there was much danger in “abandoning them to the speculations of an individual landowner”.<sup>787</sup>

The remodelling of property laws during the revolution led to a number of conflicts. In the An VI (1797–1798), the town of Bagnères wrote to the government, shocked that the state wanted to seize its land, including the spring which had been the property of the municipality for six centuries, since 1315 to be exact. The letter argued that, though saying mineral waters belonged to everyone was a nice idea, it was incompatible with the rights to property of communes. And since the government apparently planned on selling the spring to a private owner, the municipality argued that waters were not the same as any other resource, they were a public good. The bids on the spring therefore had to be stopped.<sup>788</sup> These discussions continued into the An V (1796–1797), in which they debated which version of ownership would bring more revenue to the commune.<sup>789</sup> Much of the discussion was centred on the importance of having a lot of capital to fund the reparations to the spring.

This question of ownership was linked in direct ways to the discussion around the pricing of waters. One report on the waters of Aix made an

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<sup>787</sup> Report on the correspondence to the *École*, (An 6), AJ/16/6697, n°266, AN. Danger “de les abandonner aux spéculations d’un propriétaire particulier”.

<sup>788</sup> Ibid.

<sup>789</sup> “Extrait des registres des délibérations de l’adm. du Canton de bagnères de luchon”, (An 5), AJ/16/6697, AN.

argument in favour of letting the owners set their own prices. The document stated that in most places, the waters were set at a price which was in many ways arbitrary, at least regarding the composition of the water. But this freedom “has not been costly to the public”, because the distributors of mineral waters have always made the calculation that it was more advantageous to “sell at a smaller price a large quantity to a large number of individuals”, rather than selling for a high cost “a small quantity of water to a small number of patients”.<sup>790</sup> This market force, according to him, always kept the prices low, despite the number of privately-owned springs.

The question of property was also naturally tied to the question of regulation. In a report asking questions to the minister regarding the inspection of mineral waters in the An X (1801–1802), it was asked whether the government should be allowed to nominate inspectors for privately-owned springs. The answer was that because mineral waters were medicines, they had to be in part controlled by the state, which had to insert itself in the choice of inspectors. It was stated though, that the municipalities and landlords were allowed to submit candidates for the state to consider.<sup>791</sup> The answer to the report also added that few people would be willing to finance the inspection over mineral waters, which was also why it had to be conducted by salaried government agents.

The commission put together by the *École de Santé* received so many questions on this topic that they produced their own memoir on the subject.<sup>792</sup> The memoir first argued that nations owned the land, and that extended to the waters within the land. In addition, mineral waters were in some ways comparable to mines, because of their public utility, and should therefore be the property of the state as such, regardless of where they were. But the memoir then presented a few counter arguments to this, the most important being that if this were applied, most mineral waters would never be brought to public knowledge, for fear of state interference on one’s land. In addition, while a mineral water needed investments in order to become usable, the sums of money in question were nothing compared to the huge expense necessitated to run a mine. The memoir also explained that the rights of communes to waters was sometimes complicated to establish, as those communes no longer held the physical paper titles which granted them such rights. The memoir

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<sup>790</sup> Report on the waters of Aix, (An IX), AJ/16/6698, AN. “Nous observeront que jusques ici les prix des eaux minérales en général, n’ont pas eu de base commune qu’il ont été presque partout arbitraires, et que celle latitude laissée aux propriétaires ou fermiers, n’a pas été onéreuse au public, parceque elle a été naturellement restreinte par l’interêt particulier des distributeurs qui savent très bien balancer l’avantage de vendre cher une petite quantité d’eau a un petit nombre de malades, avec l’avantage infiniment plus grand sous tous les rapports, d’en vendre a moindre prix une grande quantité a un grand nombre d’individus.”

<sup>791</sup> Report on the questions sent to the minister regarding the administration of mineral waters, (An X), AJ/16/6698, AN.

<sup>792</sup> “Rapport sur differents mémoires relatifs aux Eaux minérales envoyés à l’Ecole par le ministre de l’interieur”, (An 10), AJ/16/6697, n°189, AN.

cited the issue in Plombières, in which both the Republic and the municipality claimed to be the rightful owner of the spring. The memoir also mentioned the cases of municipalities which used to be the owner of their spring but were not able to keep it due to a lack of funds. While this case had appeared before the revolution, it was much more common after.

An argument which had been raised by some in the revolutionary government stated that since all communes were representatives of the nation, the state could technically declare all municipal properties void, and part of the state instead. The memoir rightfully pointed out that such a decision would be so highly unpopular that it was hardly worth considering. Finally, the memoir touched on the rarer cases of individually owned waters, which were mostly situated in Paris. The memoir mentioned the common critique of private ownership, which “exposed the patients to being deprived of an aid which nature does not offer everywhere.”<sup>793</sup> The counter argument to this was that it was not in the interest of the owner to restrict access to their waters either.

The memoir finished on a few reflexions around the complexities of establishing rules for the market of mineral waters. It stated:

in all times one has felt the necessity to make some laws and some rules for the police and administration of mineral waters by the means of which the public can be sheltered from traps, frauds and extorsions which greed and bad faith keep imagining to betray [the public's] credulity<sup>794</sup>

The memoir referenced the Letters patent of 1605 as a testimony to the endurance of this idea. The issue however, was that despite these numerous attempts at legislation, the rules were rarely being followed. Most recently, they described how although owners were technically required to inform the government of any spring discovered on their land, few actually did so. It concluded on a short scientific discussion of the waters, stating that in order to suppress fraud, and to solve these long running issues, scientific research, made by a community of good scientists, acting without prejudice or interest, might be a step in the right direction.

The memoir did not settle the debate of property regarding mineral waters, so much as it highlighted its main components. Mineral waters were difficult to link to a universal law of property because of their unique status.<sup>795</sup> In

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<sup>793</sup> Ibid, “exposeroient les malades a être privés de secours que la nature n'offre pas partout.”

<sup>794</sup> Ibid, “de tout temps on a senti la nécessité de faire pour la police et l'administration des eaux minérales des lois et des reglements au moyen desquels le public peut être mis à l'abri des pièges, des fraudes et des exactions que la cupidité et la mauvaise foi ne cessent d'imaginer pour tromper sa crédulité”.

<sup>795</sup> In the An XII (1803–1804), a landlord who lived in Vichy dug in his property to find a natural spring. This of course led to some conflict with the municipality, and they stated the “the owner of a spring of mineral Water cannot be assimilated to the owner of any other Kind of Good.” This was again tied to the remedial nature of mineral waters. Since they were both natural resource and medicinal product which required care and attention, the owners could not simply enact a profit-oriented entrepreneurship onto any spring that they found, or at least that

consequence, conflicts between different levels of ownership came up on numerous occasions.<sup>796</sup> The question of ownership had also been exacerbated after the revolution, not only because the question of property in itself was being debated, but also because a few individuals had taken advantage of the revolutionary chaos to acquire springs on the cheap, which they were not managing with great care. Complaints of poorly run springs by private owners came up. In the An XII (1803–1804), an inspector wrote a complaint, describing installations which were falling to pieces, the poor were no longer welcomed at the spring, all because of a greedy owner who refused to make any expenses at all. The inspector strongly suggested that the state intervene to transfer the ownership of the spring back to the municipality.<sup>797</sup> The document added that it might be possible to prove that the original buy out by the current owner was illegal, and that the possession could be taken away against a monetary compensation.<sup>798</sup>

One report on the waters of the Mont d'Or explicitly pointed to the revolution as being the origin of such problems. It explained that before the revolution, the waters belonged to the commune. Their use was very cheap, and mostly free access. But after the revolution, the descendants of the destitute lord shared the property between themselves, and a private individual found an opportunity to buy the spring "at a vile price".<sup>799</sup> After many events and debates, the commune tried to buy back its waters, but the owner, wise to the fact that his investment in the waters was only ever going to be profitable if he managed to sell on the spring, demanded a large compensation. The situation was not fully resolved for some time. As late as 1818, according to a pamphlet printed by Lizet, the owner of two bathing establishments in the Mont d'Or, the waters themselves belonged to the state, but private individuals could develop them and own and profit from bathing establishments. The pamphlet described a situation in which the inspector, seemingly having lost all sense or reason, sent the army to seize the baths from their owner, and put him and his family in jail. He concluded his print by saying that if the new

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was what the municipality of Vichy argued. Report on a new spring in Vichy, (An XII), AJ/16/6698, AN. "D'abord, il paroît certain que le propriétaire d'une source d'Eau minérale ne peut pas être assimilé à un propriétaire de toute autre Espèce de Bien./ En Effèt, une Eau minérale devant être Employée comme Médicament, il est nécessaire que les malades qui sont dans le cas d'en faire usage aient la certitude que les vertus de cette Eau sont si bien réelles, qu'elles ont été constatées par des Expériences multipliées, & qu'enfin on a pris toutes les mesures convenables pour écarter les fraudes que des raisons d'intérêt pourroient introduire."

<sup>796</sup> See a case in which the owner and the inspector nominated by the state debated on who had authority on the waters. Report on a new spring in Ax, (An XII), AJ/16/6698, AN.

<sup>797</sup> Report by Frison on the waters of Digne, (An XII), AJ/16/6698, AN.

<sup>798</sup> In a similar case, a commune, short of funds, wanted to give the control over the waters to a private owner, but the prefect of the region stepped in to forbid the sale, as it would, according to a study he conducted, make the situation worse. Report on the waters of Bonnes, (Pluviose An XII), AJ/16/6698, AN.

<sup>799</sup> Correspondence from the prefect of the Puy du Dôme to the *École*, (29<sup>th</sup> April 1808), AJ/16/6697, n°100, AN. "On sait qu'ils ont offert les eaux du mont d'or au vil prix de douze et quinze cens francs".

king cared to buy back the bathing establishments, he would not be opposed to it.<sup>800</sup>

These issues of ownership highlight more than anything the difficulties in capturing mineral waters from a legal point of view. Despite centuries of attempt at regulation, problem solving, conflict resolution, the waters still eluded control, especially centralised control. While the pyramidal structures of the *Ancien Régime* had failed in the face of regional idiosyncrasies, the idea of a profit-centred privately managed market of waters also received a lot of pushback very early on. Mineral waters needed the flexibility of local government, but they also needed the funds of the state, and the protection against fraud and medical misuse that only regulation could provide.

## Conclusion

In this chapter, I endeavour to show the inherent difficulties in capturing mineral waters through both market and regulation. While previous chapters highlighted the ambitious legislative plans of the First physician, the *Commission* and the *Société*, the current chapter describes the encounter between these plans and the reality of mineral waters. I argue that the challenges they presented to all regulatory bodies of the eighteenth century were due to their highly decentred nature.

By decentred, I mean different things. The waters were physically dispersed in the French kingdom, but the decentredness was also social. The waters had been used by communities and towns for many years, and consequently, traditions of the human and legal kind had been established over their usage. These regional habits varied according to the history of the area, and to variety of other factors, like the presence of a powerful town parliament for example.

This decentred nature made the waters difficult to rule, and this adversity was felt by all administrations who tried their hands at it. The *Commission* and the *Société* attempted to resolve conflicts that arose within the dispersed market of waters, but their efforts, even when they were successful, were always at the cost of much time and dedication from the Associates. In that sense, it is very telling that the bureau which received the most support and scrutiny was located in Paris, the only bureau which was actually within walking distance of the centre of power.

In other parts of the kingdom however, control was more difficult to enact. The Parisian regulators attempted to employ their wide network of intendants, inspectors and other representatives of power in order to resolve local issues.

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<sup>800</sup> Les Mines, Tourbières, salines, eaux minérales, Copie du placet présenté au roi le 12 aout 1818, en réclamation contre l'envahissement à main armée des Bains du Mont d'Or, (12<sup>th</sup> August 1818), F/14/1309, AN.

And though this sometimes worked, it was very costly and time-consuming. This in turn led to a gradual decreasing of diligence from the *Société* as the years went by. They became less respondent and left the bureaus to their difficulties without intervening as often.

The final years of the *Société* and its reaction to the French revolution reveals the inherent problems which made its attempts at regulation almost doomed from the start. The *Société* was a pyramidal structure, one which valued top-down power, and a set of strict rules. As it attempted to ally itself with the Faculty for the sake of both of their survival, it was incapable to yield and accept change in its fundamental principles. In the end, this hardly mattered, as both were taken out of existence by a revolutionary decree.

The successor to the *Société*, the revolutionary government's *École de Santé*, displayed a mix of continuity and break with tradition. Initially, the *École* attempted to regulate the market of mineral waters in the same way as before. However after a few years, it became clear that the central pillar of *Ancien Régime* administrations, the privilege, was the component which held the prior administration of mineral waters together, while also being its biggest weakness. The privilege did not stop fraud, but it did hinder entrepreneurship.

After the revolution, a number of debates took place regarding the question of property rights. Mineral waters were difficult to qualify in terms of strict property. Those debates had to settle for duelling interests. One on hand, private ownership of mineral waters might lead to a greater utilisation of waters. On the other, mineral waters were a medical product, and one that should not be taken away from the public by profit-driven owners. In the end, these debates were an early sign of things to come. Mineral waters of the nineteenth century would be characterised by an opposition between the forces of profit and those of charity, but this question leads me outside of the realm of the present thesis.

## Chapter 6. The analysts

The history of the *Société*, with its ambitious ideals, struggles, government ties, and wide-reaching network, tells an important facet of the story of early modern mineral waters. It is however not the only perspective on mineral waters which can and should be considered. In the following chapter, I will shift focus from the institutional angle to the viewpoint of the social group which most closely embodied the advent of the new scientific gaze onto the waters: the analysts.

The central line of enquiry in this thesis is to understand how mineral waters were brought, by markets, regulation and scientific methods, into the Enlightenment. This third aspect of the enlightening process was in part the result of the *Société's* high scientific standards. But scientific work on mineral waters was being conducted long before 1776. The *Société* institutionalised an already established practice rather than innovate new analytical techniques. The people responsible for developing this method were an eclectic collection of actors, with inconsistent ties to official medicine, chemistry, and pharmacy. Because they all partook in one unifying activity – chemical analysis – I have elected to call them analysts.

Chemical analysis is the name given to the process of breaking down a mineral water into a list of components using methods from the field of chemistry. Temperature measurements, distillations, evaporations, all were techniques which could be conducted by analysts.<sup>801</sup> The primary purpose of analysis was to determine a water's exact composition. Some analyses attempted to weigh the quantities of each mineral present in the water, others did not. The resulting list could then be used in order to refine the prescription of the water, among other applications.

In order to communicate results, the analysts wrote reports recounting how the experiments were conducted, which tests were chosen, and what could be induced from the observations. Those reports were by no means impersonal. The aim was more complex than simply relating the experiments and interpreting the findings. The report also had to convince the reader or reviewer of the validity of the method used, and of the reliability of the analyst himself. The mechanics of conveying expertise were not uniform throughout the period at hand, which led to a variety of writing styles used in the reports.

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<sup>801</sup> See Chapters 7 and 8 for a full description of the eighteenth-century analytical method.

Other factors participated in diversifying the contents of the analyses. The analysts had all kinds of intents for making their experiments, at times explicit, often unspoken, which further muddled the inflections of the reports. The author's voice was present in those writings, more than could be expected from scientific texts. They often addressed their readers, sometimes talking to the First physician or the *Commission* directly. They pleaded for a position or wrote lyrical odes to the glory of chemistry. Some reports focused on medicine; others included diatribes against the poor management of a spa or complained about breaking an expensive thermometer on the way to the spring. Overall, these texts were at times messy, uneven in length and quality, and rarely followed the same exact structure.

Their complete lack of neutrality is what makes the analytical reports such fascinating sources. The interests, perspectives, and the constraints that applied to the analysts appears visibly in the reports. These constraints did overlap with some of the forces mentioned already – several mineral water analysts were *Société* correspondents, or even Associates. What a *Société* member might think about chemistry and its place in promoting the mineral water market has already been touched on. But the world of water analysts was evidently not one where actors simply listened to the *Société's* good word and applied its protocol, no questions asked. The analysts had their own background and education, and they often expressed challenging views of what chemistry or medicine was to them.

Overall, I argue that the analysts were connected by more than the shared endeavour of chemical analysis. They could be viewed as a group with its own language, methods and theories, despite their inherent diversity. In that sense, I believe that the analysts constituted an 'esoteric circle', to borrow a term from Fleck.<sup>802</sup> This circle had its own coherence, its own dynamics, and would later influence the views of the public on mineral waters. But for now, I simply want to explore this circle of analysts, and characterise the members who constituted it.

The purpose of this chapter is threefold. I want to first give an indication of who the analysts were, by giving a succinct social description of this group of actors. Secondly, I will explore what the reports reveal of the ways in which these analysts worked. The reports alluded to numerous collaborations, and they frequently cited their peers and intellectual influences. A study of these citations will produce a sketch of eighteenth-century scientific relations, which reflects power structures and institutional hierarchy, but does so in a rather different way from what the *Société's* network showcased. And finally, this chapter will provide a first glimpse into the representations of medicine and chemistry expressed by the analysts of waters. Because only the reading of several dozens of analysis reports can do justice to the complexities of the

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<sup>802</sup> Fleck, *Genèse et développement d'un fait scientifique*, 184.

networks at hand and the viewpoints of the analysts, this chapter will be the first to draw heavily from the database put together for this thesis.<sup>803</sup>

## Chemistry practiced by medical men

The 1768 treatise on the waters of Plombières asserted in its introduction: “The Author is neither Physician, nor Chemist, nor Empirical, nor Surgeon.”<sup>804</sup> He was in fact an abbe, but he described himself as someone who just happened to be inquisitive and keen to share entertaining rather than erudite information about the waters. His self-appraisal, however, provides a rather accurate portrait of who he believed a proper water specialist ought to be. In his time, and long before the creation of the *Société*, those who wished to write confidently about the scientific aspects of a mineral water had to be medically or chemically inclined. Some years later in 1784, the physician Regnault started his own analysis by describing how most mineral waters by now had been analysed by “physician-chemists”.<sup>805</sup> Those comments suggests that medicine and chemistry were more than helpful areas of knowledge to analysts, they were mandatory.

The impressions of these two men are confirmed by a glance at the authors of water analyses. Concerning the majority of analysis reports, I was able to find a name and an occupation. In the case of printed works, the credentials of the writer were stated outright on the cover.<sup>806</sup> For manuscripts, their author occasionally listed their own education, or addressed other physicians as “*confrères*”,<sup>807</sup> hence signalling their belonging to the medical profession. A few authors could not be identified through cursory research, but most of the analysts have been identified at least through this mean. Out of the ninety-three

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<sup>803</sup> See Chapter 1, Methodology section, for further detail on the structure and contents of the database. Each entry corresponds to a water analysis report that was written in the French language during the eighteenth century (ca. 1720–1810). For this chapter, I will make use of the categories regarding the analysts’ education and their reason for conducting the analysis.

<sup>804</sup> Dom Calmet, “Traité Historique des Eaux et Bains de Plombières, de Bourbonne, de Luxeuil, et de bains,” (A Nancy, chez Leseure, Imprimeur ordinaire du Roi, 1768), preface, 3. “L’Auteur n’est ni Médecin, ni Chimiste, ni Empyrique, ni Chirurgien.”

<sup>805</sup> Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. “medecins chymistes”.

<sup>806</sup> An example of such credentials is the following: “Faite par M. Fourcry, ancien Apothicaire Major des Camps & Armées du Roi, sous les yeux de M. Raulin, Médecin ordinaire du Roi, Censeur Royal, Inspecteur Général des Eaux Minérales du Royaume, de la Société Royale de Londres, des Académies des Belles-Lettres, Sciences & Arts de Berlin, de Bordeaux, &c.”. This example is in: Fourcy, “Analyse des eaux alkalino-martiales de Trye-le-Chateau avec l’exposition de leurs propriétés faite par M. Fourcy, Faite sous les yeux de M. Raulin,” (publiée par M. Pelvilain, à Amsterdam, et se trouve à Paris chez Fr. Valade, 1779).

<sup>807</sup> Since many analyses were sent to the *Société*, which was almost entirely made up of physicians, these mentions were frequent. The term “*confrère*” translates to “colleague”, but it was (and still is) a term used specifically in the medical field as a way to refer to a fellow medical doctor.

reports in my possession, almost every single analysis was performed either by a physician, an apothecary, a surgeon or a chemist.<sup>808</sup> The physicians were most represented, with 70% of the analyses being made by someone holding a degree from a faculty of Medicine. Paris and Montpellier were the more frequently represented universities. A portion of these physicians held dual qualifications in medicine and surgery, amounting to 6.5% of them. A mere two analyses were made by individuals who were solely surgeons. Apothecaries accounted for 15.1% of the total, making pharmacy the second most represented discipline. And finally, 11.8% of the analyses were made by someone who could be considered a chemist.<sup>809</sup>

A few things can be inferred from these initial results. Firstly, and perhaps most obviously, all the analysts were men. If a degree from a Faculty of medicine or from a College of Apothecaries was necessary in order to write a water analysis, there was a clear roadblock for any woman interested in the matter. Though there are examples of eighteenth-century women learning chemistry through other means than the medical route, particularly via public courses, no women-authored works on chemical analysis specifically have been found here.<sup>810</sup>

Secondly, and exemplified by the percentages adding beyond 100, is that water analysis often demanded a double expertise. This could take the form of an analyst with a dual education (for example, in medicine and in chemistry). In other cases, the analysis was made by a team of two people with distinct professions. These teams typically distributed the tasks between a physician in charge of theory and interpretations, and an apothecary or chemist, performing the laboratory experiments.

Thirdly, the dominance of medicine in the field is abundantly clear. While different branches of medicine were represented, and apothecaries were actually more represented in published books on water analysis, the dominance of physicians is also obvious. The presence of chemists is more difficult to comment. Any water analysis necessitated chemical knowledge. It was called a

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<sup>808</sup> This excludes nine instances in which the education of the analyst could not be found, and one case of an analysis performed by a cleric. It should also be added that because this corpus includes both highly circulated analyses and much more private ones, the representation of medicine is not simply an artefact of rights to publishing.

<sup>809</sup> These percentages add up beyond 100. This is for the simple reason that a number of analysts sport a double qualification. Someone like Rouelle for example, was trained as an apothecary. It would however be, in my opinion, a mistake not to label him as a chemist also. Hence, he is categorised as both apothecary and chemist in my data. Similar decisions were made for everyone labelled “chemist”, as there was no formal qualification for what constituted a chemist at the time. See Appendix n°[1].

<sup>810</sup> Women attended the Parisian public courses in chemistry. Christine Lehman, “Les multiples facettes des cours de chimie en France au milieu du XVIIIe siècle,” *Histoire de l’éducation* 130 (2011). In addition, some women like Marie Paulze Lavoisier were known for their involvement with chemistry, but she in particular is not known to have engaged with water analysis. Francesca Antonelli, “Scrittura, sociabilità e strategie di persuasione: Marie-Anne Paulze-Lavoisier, secrétaire (1758–1836)” (Dottorato di ricerca in Philosophy, science, cognition, and semiotics Università di Bologna, 2021).

chemical analysis, which was no misnomer. The processes involved were unambiguously chemical in nature. Despite this, the reports show that only some of the analysts called themselves chemists, or had unmistakable ties to chemistry, such as a chair at the Academy of Sciences. This gives the impression that chemical analysis was in reality mostly performed by people who saw themselves as men of medicine first.

The data shows no discernible trend in increase or decrease of a particular kind of education throughout the decades studied here. Water analysis was performed primarily by men who had graduated from medical faculties, and that was true throughout the entire eighteenth century. It also shows that some analysts were more prolific than others, but the margins were not extensive. Chemical analysis was a difficult skill, and most of the physicians that undertook it had to learn a significant amount of both theory and know-how before they could engage with the practice. Given this, I expected to see a few names come up again and again, as those physicians would have perhaps wanted to capitalise on this new knowledge. But this does not appear to be the case. The majority of authors in my corpus, 71% of them, appear only once. Some authors did show up several times, but never enough to constitute a large body of work.

Most of the repeat analysts only authored two reports. To give the example of someone mentioned in previous chapters, Fourcroy, a *Société* Associate, made the analysis of the waters of Sainte Reine by himself, and joined forces with Jean Jacques de Delaporte to analyse those of Enghien, but he does not appear to have written numerous other reports.<sup>811</sup> The team of physicians Chaussier and Deyeux have authored two analyses together. The physician and chemist Le Veillard, and the physician Maret also wrote two reports each.<sup>812</sup>

Only two outliers stand out in the corpus. The first one was Chifoliau, a physician and surgeon from Brittany, correspondent of the *Société*, who used his analytical skills to become the intendant of the waters of Saint Malo. He completed five analyses in total. He was initially asked to remake his first, in order to correct a few errors, but his second attempt was acclaimed at the *Société*.<sup>813</sup> He received an award of “encouragement” for his efforts, likely the reason why he made repeated efforts to analyse other waters in his region. The most prolific analyst of the corpus was the Lyon-based physician Richard de

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<sup>811</sup> His *Traité complet des eaux minérales de la France* from 1792, despite its name, mostly concerned the analysis of the spring of Enghien, and referred to various authors when it comes to the analysis of other waters. Antoine François de Fourcroy and Jean-Jacques de Delaporte, “*Traité complet des eaux minérales de la France*,” (A Paris, chez Gay & Gide, Libraires, rue Honoré n°85, vis-à-vis la Maison d'Aligre, & rue d'Enger, n° 731, 1792).

<sup>812</sup> One team of physicians, Chaussier et Deyeux, made two analyses; Chifoliau, a physician and surgeon, made five; physician Cuel made four; Fourcroy did one by himself, and one with Delaporte; Gallot, a physician, did three; Laprade, a physician, did seven; Maret, a physician, did two; Veillard, a physician and chemist, did two.

<sup>813</sup> Correspondence from Chifoliau to the *Société*, (1781), SRM 92B, dossier 36, ASRM.

Laprade. He authored a total of seven complete analyses, all on waters of the region surrounding Lyon.<sup>814</sup> In addition, he wrote succinct descriptions of other springs. His case presents similarities to Chifoliau's. He was not a correspondent of the *Société*, but he was a correspondent of the Academy of Sciences, Arts and Literature of Lyon. He was also the intendant of the waters of Montbrison.<sup>815</sup> Being an active member of the Academy, alongside his professional involvement with mineral waters were likely the main motivations behind his comprehensive studies of the regional waters.

The absence of more prolific water analysts in this corpus does not mean that they did not exist at all. The chemist Venel for example, wrote around thirty water analyses in the years of his mission, but they have been unfortunately lost to time. The popular treatise of Antoine-Grimoald Monnet (1734–1817) on French mineral waters also included a few different analyses.<sup>816</sup> In addition, there are example of analysts who made comprehensive studies in other countries, such as Friedrich Hoffmann (1660–1742) who wrote many German-language water analyses.<sup>817</sup> But what my data shows is that the majority of chemical analyses were made by newcomers to the field. These physicians with a momentary interest in analysis authored the majority of works on chemical analysis. Seasoned experts with a lot of experience in the field were a much rarer occurrence.

## Income, scientific contribution, damaged reputations: the manifold reasons behind the analyses

The majority of analysts were completely unknown to the record of famed scientists of the Republic of letters. Understanding their motivations for participating in the difficult task of analysis is therefore all the more essential. Chemical analysis was far from being a trivial operation. It required knowledge, time, as well as equipment, and often the means to travel to a spring. None of these hurdles would have been impossible to overcome for a well-off town physician or apothecary, but they were significant enough to require a real motive. And while it is not difficult to put together why someone

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<sup>814</sup> He analysed the waters of Ambert, Saint Alban, Montbrison, Vals (the Marquise spring), Sail sous Couzan, and Saint Galmier, in addition to which he made succinct analyses of numerous other springs in the Forez.

<sup>815</sup> Jean Merley, *Histoire des eaux minérales de Saint-Galmier* (Le Puy en Velay: Presses de l'imprimerie commerciale de "L'Éveil de la Haute Loire", 1994), chapitre 2, partie II, "L'œuvre de Marin de Laprade".

<sup>816</sup> Antoine Grimoald Monnet, "Traité des eaux minérales avec plusieurs mémoires de chimie relatifs à cet objet," (A Paris, Chez P. Fr. Didot le Jeune, Quai des Augustins, près du Pont S. Michel, à S. Augustin, 1768), 107, 115. "Analyse des eaux de Bard en Auvergne", "Analyse des eaux d'Aumale".

<sup>817</sup> Friedrich Hoffmann, "Nouvelles expériences et observations sur les eaux minérales de l'Allemagne ... traduites du célèbre Frédéric Hoffmann," (Berlin, chez Aude et Spener, 1752).

like Venel analysed the waters – he was paid to do so – that was not the case for most analysts. They designed and went through the experiments, wrote the reports and sent them to the world out of their own funds, an activity which was unlikely to bring them fame or fortune.

Thankfully, about two thirds of the analysts in the corpus spelled out the reason that motivated their work. Of course, it must be acknowledged that the reasons stated by the analysts were carefully selected arguments, and not necessarily a reflection of their genuine intents. The following study of their motivations is therefore explicitly text-based and will take those arguments for what they were: a textual device, which highlight the kind of values that analysts believed to be important to their peers, and the kind of pressures that were put on them.

By reading and summarising every stated reason to make an analysis, I have been able to sort them into a few categories. Although the arguments were not the same word for word, similar sentiments were often expressed in several works from different years.

### *Philanthropic arguments*

Many analysts explained that their reports were written with the intent of protecting the public from medical malpractice. They worded it in different ways and placed this justification at different points in the report, but the trope was still recognisably present.<sup>818</sup>

This expressed will to do ungrateful work for the sake of the continuation of science, and for the purposes of enlightening a mysterious corner of the natural world was a fairly typical argument of eighteenth-century savants. It is therefore not terribly surprising that the analysts of mineral waters would partake in this kind of rhetoric. It was equally unsurprising that, as physicians and apothecaries, they often justified their work in a somewhat philanthropic fashion. A total of seven analysts made this their primary motivation. Helping the public, or “humans in pain [*l’humanité souffrante*]”,<sup>819</sup> was a repeatedly used expression.

Marguery mentioned that he analysed the waters of Passy because the waters were given freely to the poor, and thus had to be checked for safety.<sup>820</sup> Another physician expressed his amazement at the fact that mineral waters could alleviate so many diseases. To him, this made chemical analysis a *de facto* noble quest, regardless of the difficulty. He analysed the waters of Haute

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<sup>818</sup> I have not included implicit reasons in this particular reflexion. I have only selected reports in which the analyst specifically worded a reason to make his analysis, either by addressing the reader directly, or by discussing his motives in annex documents, for example a letter asking for a position as intendant of the analysed water.

<sup>819</sup> An example of this can be seen in: Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM. “*l’humanité souffrante*”. But the expression was a common trope across many documents regarding mineral waters.

<sup>820</sup> Marguery, “*Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.*”, Preface.

Rive, because they could cure the “oddities and bewilderments” of nature, an expression he used to refer to diseases.<sup>821</sup> But mostly, this argument was used when the analyst believed the waters were consumed in an improper manner. Either the waters were taken freely, when the intendant was absent from the spring, or the waters were so poorly understood that the local physicians had nothing on which to base a diagnosis.<sup>822</sup>

### *Analysing out of scientific curiosity*

The most often cited motivation for analysis, mentioned nineteen times in the corpus, was plain scientific interest. This scientific motivation was sometimes expressed in relatively vague terms. When that was the case, it appears to have been more of a rhetorical device. One analyst claimed to write his report in order to extirpate medicine from the “whims of empiricism”<sup>823</sup>, while others simply stated that they wished to contribute more knowledge to an under-studied area.<sup>824</sup> Marguery explained that he wanted to analyse the waters out of “curiosity, the desire to learn, & the purpose I had to train myself on these sorts of researches”.<sup>825</sup> Bollioud expressed that his desire was to participate in the Republic of Letters.<sup>826</sup> In his 1754 analysis of the waters of Spa, Limbourg claimed that chemical analysis had become a stagnant field, and that a remedy as salutary as mineral waters deserved better research. He conceded that scientific progress could only happen through persistent enquiries, thus justifying his own contribution.<sup>827</sup> Echoes of this attitude could be found in many works. In 1760, the surgeon Doucet expressed his wish to bring the new lights of chemistry onto the tenebrous science of waters.<sup>828</sup>

For others, the scientific interest was part of a more encyclopaedic approach to knowledge. The analysis was described as a tool to better understand the medical assets and resources of a region. Laprade, Cadet, and Lassone all

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<sup>821</sup> He referred in particular to kidney stones, a particularly painful condition which was remedied by the waters, as per his claim. Analysis of the waters of Haute Rive by Godin, (1743), Ms pa 206, f11–16, AAL. “bizarreries et egarements”.

<sup>822</sup> Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM. On the problem of an absent intendant, see: Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM. For the case of waters being used without any medical oversight, see: Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

<sup>823</sup> Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM. “les caprices de l’empirisme”.

<sup>824</sup> Méglin, “Analyse des eaux minérales de Sultzmatt en Haute Alsace.”, 3.

<sup>825</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, preface. “ma curiosité, le desir de m’instruire, & le dessein que j’avois de m’exercer sur ces sortes de recherches, m’ont engagé à examiner moi-même & à voir par ma propre expérience ce que j’en devois penser, sans aucune envie de contredire.”

<sup>826</sup> Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL.

<sup>827</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, ii. “il n’est point surprenant qu’il paroisse tous les jours des traités sur cette matière, sans que l’on fasse pour cela de fort grands progrès sur la decouverte de leur nature”.

<sup>828</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

expressed ideas of this kind, sometimes associating their analysis with a medical topography, or integrating them as part of a wider regional survey.<sup>829</sup>

A few analysts also described their work as a way to explore a particular scientific question. The apothecary Machy wrote his analysis as an exercise in comparison of two famous and widely used waters, in order to discern what in their composition might lead to their differences in effects.<sup>830</sup> Another analyst was interested in the applications and remedial qualities of the “aqueous fluid” in general, and studied mineral waters as part of a wider interest.<sup>831</sup>

### *Analysing out of duty*

Six of the analysts expressed their desire to write a chemical analysis out of a duty to their position. Either because of their status as a *Société* correspondent, or their belonging to a different institution, they explicitly stated that they saw their analysis as a way to honour this status. Dufau expressed that he analysed the waters of Barbotan because he had been nominated inspector of those waters.<sup>832</sup> Bertrand-Lagrésie described his enthusiasm when he read the letter announcing the creation of the *Société*, which motivated him to start work on an analysis.<sup>833</sup> Sometimes, the analysts would acknowledge the limitations of their own works. They explained that in order to help with the *Société's* endeavour, the least they could do was to communicate the existence of an interesting water and allow its qualified members to decide on a course of action.<sup>834</sup>

For others, it was simply their profession in the medical field which they named as principal motivation. The physician Bo saw it as his duty to medical knowledge to familiarise himself with the mineral waters of his town, and as a duty to the *Société* to share those findings.<sup>835</sup> Rather unusually, one of the analysts expressed his desire to perform the analysis of the waters of Saint Honoré as stemming from patriotism.<sup>836</sup> Technically, even belonging to a

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<sup>829</sup> Analysis of the waters of Roye by Lassone and Cadet, (earliest 1770), SRM 91B, dossier 32.; Analysis of the waters of the Forez by Laprade, (earliest 1772), Ms 120, f254–257, AAL. Faire connaître les eaux encore “inconnues aux chymistes”.

<sup>830</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”

<sup>831</sup> Analysis of the waters of Prémieux by Maret, (between 1779 and 1787), SRM 91B, dossier 17, ASRM. “Cette idée que l'analyse fera naturellement prendre de ces eaux à tous les médecins qui savent apprécier les vertus du fluide aqueux, les modifications qu'il éprouve des principes qu'il tient en dissolution est déjà justifié par un grand nombre d'expériences concluantes.”

<sup>832</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM.

<sup>833</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

<sup>834</sup> Montesquiou expressed that more talented physicists would be able to make better analyses than he ever could. Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL.

<sup>835</sup> Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM.

<sup>836</sup> Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM.

particular nation could be a motivator behind the work of analysis. These kinds of motivations were found throughout the century.

### *Economic motivations*

A common motivation was economic in nature and pertained to the desire of the analyst to give the waters some notoriety through analysis. This appeared in the reports as a separate intent from the basic obligation to provide an analysis in order to be able to put the waters on sale. Some waters which had no prospective sellers were still being analysed, because of the hope of attracting interest and revenue for the region. Fifteen reports stated that they explicitly wished to bring fame to the water being analysed. In 1736, physician Baudry expressed that he wished to bring some positive attention to the waters with his analysis, as their reputation had been tarnished by poor use.<sup>837</sup> At times, this desire was even more explicit, like when the analyst of the waters of Bugey stated that he hoped to bring those waters to the forefront of French mineral waters.<sup>838</sup> Antoine Nicolas Gavinet (1724–1795), when he analysed the waters of Montbrison, hoped that they would become competitive, saying “I wish that the researches I just made on these waters may make all their importance known in montbrison, and that they commit the physicians from other neighbouring towns to employ them”.<sup>839</sup> He added that most people could not afford the more popular waters of Vals, and that the Montbrison spring cost half as much as the Vals counterpart. This comment is quite the testimony to the entangled nature of the scientific and economic aspects of mineral waters. Likewise, Dufau when writing about the waters of Barbotan, hoped that he would inspire the owners of the spring to restore its condition, and that the government would take interest, as it would both help patients and revitalise a “numb commerce”.<sup>840</sup>

Advertisement could also be made for an upcoming treatise on mineral waters, and a few authors would present their early results at scientific institutions as a way to preface their soon-to-be-published work.<sup>841</sup> In this case there is a discernible chronological trend, with most of the analysis as advertisement appearing around the time of the creation of the *Société*. Whether writing about the waters of a region that did not have many of them, or demanding more attention in the competitive market of a spring-laden mountainous

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<sup>837</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, Discours Préliminaire.

<sup>838</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL.

<sup>839</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “je souhaite que les recherches que je viens de faire sur ces eaux puissent faire connoître toute leur importance a montbrison, et qu’elles engagent les medecins des autres villes voisines a les employer, sur tout pour le peuple qui n’est pas en Etat de payer le haut prix de celles de vals, et a qui les eaux de moins rendües a lyon ne couteroient pas la moitié des premieres.”

<sup>840</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM. “commerce engourdi”.

<sup>841</sup> Analysis of the waters of Saint Galmier by Laprade, (1774), Ms 120, f282–283, AAL.

region, many wrote to the *Société* with a precise analysis, hoping that careful scientific work would also attract the good will and the protection of the *Société*.<sup>842</sup> This rush to send analyses to the *Société* around 1777 and for the next few years showcases the hope that analysts placed in its power, and also demonstrates an understanding of the scientific standard put in place by the institution. They rightfully understood that the only way to get attention from the *Société* was to manage an already famous spring, or to present an analysis so promising that the *Société* would have no choice but to pay attention.

Similarly grouped around the 1772–1780 period were the analyses sent in order to ask for a special position. Either for the right to distribute the waters, or to become an intendant or inspector, a number of analysts had hope of employment when they conducted their analyses. This concerns twelve reports in the corpus. The physician Courtois asked to become director of the waters of Bussang.<sup>843</sup> Two years later, the physician Cuel asked for the position of intendant at the waters of Martres. His 1780 analysis stated as much. In a later letter, he wrote about his joy at seeing his analysis approved by the *Société*, but expressed his discontent upon hearing that a physician had just been granted the position of intendant, when he had gone through the trouble of writing a detailed analysis specifically in order to obtain the position for himself. His enquiry is interesting, because he was so unambiguous in the reasons that had motivated the care he put into his analysis.<sup>844</sup> He asked if the injustice of his situation could be addressed. In 1788, the owner of the source of Enghien asked Fourcroy and Delaporte to analyse his waters, in order to be granted the right to sell them. His first analysis had been denied by the *Société*, seemingly because it had been made by Faculty commissaries.<sup>845</sup> Institutional conflicts also made their way into the motivations behind analyses.

A further five analyses were similarly made by hired hands. In these cases, the analyst would send the report to the relevant institutions themselves, but did so in the name of the person who paid for their services. Four of the five analyses of this kind were made after the creation of the *Commission*, with the exception being the analysis of the waters of Passy ordered by Sénac.<sup>846</sup>

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<sup>842</sup> Grignon explained that because Brittany was so depleted of mineral waters, the few that it did have should be treated with special attention. See: Analysis of the waters of Rochefort by Grignon, (latest 1775), SRM 91B, dossier 27, ASRM. In another example, Soulere argued that the spring of Bain de Rennes deserved more attention than it currently received, because of the advantages that it brought to the people of the Languedoc. See: Analysis of the waters of Bain de Rennes by Soulere, (1778), SRM 113, dossier 12, ASRM.

<sup>843</sup> Analysis of the waters of Bussang by Courtois, (1778), SRM 112, dossier 7, ASRM. He was granted the position, see: Letter of recommendation for Courtois, SRM 91B, dossier 23, ASRM.

<sup>844</sup> Correspondence from Cuel to the *Société*, (1780), SRM 90A, dossier 7, ASRM.

<sup>845</sup> Fourcroy alluded to this prior analysis by the Faculty, seemingly giving it little credit. Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 29.

<sup>846</sup> Guillaume-François Rouelle, “Analyse de l'eau minérale de Monsieur & de Madame de Calsabigi, nouvellement découverte en leur Maison de Passy,” in *Analyses chimiques des nouvelles eaux minérales, vitrioliques, ferrugineuses, découvertes a Passy dans la maison de*

In addition, six more analyses were made in order to answer a specific question about a water. These were not necessarily ordered by an individual or an institution, but they still clearly answered a public request. Two of these were made in order to determine whether or not a particular water was mineral, one in order to determine whether it was safe to drink, another to decide on the origin of the odd smell of the water. The final two attempted to elucidate whether a newly found spring differed in composition from another water in its vicinity.<sup>847</sup>

### *Conducting research to weigh in on controversies*

Controversies appeared as stated motivations. Whether it be a criticism of the state of research, or a response to outright confrontation, ten analyses justified their existence as a way to right wrongs. The 1750 essay on the waters of Bussang had the explicit purpose of attempting to restore the reputations of the waters after rumours had spread that they might have somehow turned bad and lost their remedial properties, doing terrible damage to their reputation.<sup>848</sup> The author used the effective rhetorical device of stating that he himself had once believed in the rumours, but his careful analytical work proved that they were unfounded. In the case of the waters of Montbrison, Laprade expressed simply not being happy with the state of research. He explained that the First physician Raulin had made mention of those waters in his book on mineral waters, but that he had failed to speak of their properties. In addition, no analysis of these waters had ever been brought to the public. To him, this analysis was described as a way to address this unsatisfactory situation.<sup>849</sup>

A rather odd report in my corpus revealed the existence of a much more explicit conflict. While Laprade simply decried the lack of research on a particular spring, as did others around this time, the author of the book on the waters of Bourbonne, Chevalier, wrote his entire treatise in an angry fit against another physician. The doctor Pomme, in his book *Traité des affections*

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*madame de Calsabigi. Avec les propriétés médicinales de ces mêmes eaux, fondées sur les observations des médecins & chirurgiens des plus célèbres, dont on rapporte les certificats authentiques.*, ed. Gabriel François Venel and Pierre Bayen (1757), 53.

<sup>847</sup> Macquer and Cotte surveyed the waters of Enghien to determine if the smell had a mineral or animal origin. See: Fourcroy and Delaporte, "Analyse chimique de l'eau sulfureuse d'Enghien, pour servir à l'Histoire des Eaux sulfureuses en général.", chapitre 2, 11–36. Chaussier and Deyeux made their analysis to know if the waters of Ax were mineral; they determined them not to be. See: Analysis of the waters of Ax by Chaussier and Deyeux, (1803), AJ/16/6698, AN. Chifoliau analysed the waters to establish its different from a neighbouring spring. See: Analysis of the waters of Veaugarni by Chifoliau, (1783), SRM 93A, dossier 19, ASRM. De Horne wanted to determine if the waters of Rainsy were potable, if evaluated them to be so. See: Analysis of the waters of Rainsy by de Horne, (between 1779 and 1787), SRM 91B, dossier 20, ASRM.

<sup>848</sup> J. Lemaire, "Essai analytique sur les eaux de Bussang," (A Remiremont, chez C. Nicolas-Emmanuel Laurent, Imprimeur Ordinaire de la Ville & Marchand Libraire, 1750), Discours Préliminaire.

<sup>849</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL.

*vaporeuses des deux sexes*, stated that mineral waters were not a good remedy to the titular disease of his work.<sup>850</sup> Chevalier was most offended by this statement and claimed that it would take “*the most subtle genius, & the most persuasive eloquence, to condemn this remedy*”.<sup>851</sup> He expressed his deep disappointment that such libel against the waters had been granted the luxury of four separate editions. Chevalier pointed out the hypocrisy of the attacks, given that Pomme himself felt confident enough in the effects of mineral waters to recommend those of Passy as remedy (the page number where the mention could be found was included). Chevalier then went on to describe more of the prideful and aggressive way that he had been treated, in the “disgruntled Response of the last month of September”, alluding to some back and forth between the two parties.<sup>852</sup> This kind of offended prose was rare but not unique. Many of the analyses of the later period, especially after the 1780s, decried the poor state of chemistry and the need to update all work on the subject. Already in 1778, the analysis of the waters of Saint Santin expressed making such a work because of previous analyses, in which “both truth and Chemistry were equally insulted”.<sup>853</sup>

These are the main categories pertaining to the justification of mineral water analysis. The analysts engaged with some of the major tropes of scientific writing in Enlightenment France. Claiming to act for the benefit of humanity, to alleviate suffering, or to bring light to darkness, these arguments were very much of their time. This shows that analysts were also immersed and literate in the scientific culture of the Enlightenment. Interestingly, a number of these justifications showed little variation throughout the time period. My corpus is clustered around the second half of the century, which might be partially to blame for this apparent conclusion, though it should be noted that some of the motivations were formulated the same almost word for word in 1723 and in 1803, showing consistency in how science was communicated and justified throughout the long eighteenth century.

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<sup>850</sup> Pierre Pomme, “Traité des affections vaporeuses des deux sexes ; où l'on a tâché de joindre à une théorie solide une pratique sûre, fondée sur des observations : par M. Pomme,” (A Lyon, Chez Benoit Duplain, Libraire, grande rue merciere, à l'Aigle, 1767).

<sup>851</sup> M. Chevalier, “Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques,” (A Paris, Chez Vincent, Imprimeur-Libraire, rue des Mathurins, Hôtel de Clugny, 1772), xvi. “le génie le plus subtil, & l'éloquence la plus persuasive, pour condamner ce remède”.

<sup>852</sup> Ibid, “Mais hélas ! trop d'attachement à une opinion, sur-tout quand on l'a enfantée, ne souffre pas qu'on lui oppose la moindre raison ; &, s'il s'y joint encore des faits, des preuves, des vérités, & des vérités incommodes dont on voudroit secourir le joug, il est fort à craindre que l'orgueil ne se réveille, que la passion ne s'en mêle, & que les objections les plus sensées ne soient repoussées par des personnalités.

Telle est la maniere dont M. Pomme en a usé envers moi par rapport à mon Mémoire sur les Eaux de Bourbonne, dans sa Réponse rembrunie du mois de Septembre dernier”.

<sup>853</sup> Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM. “la vérité et la Chymie étaient également outragées”.

The increase in mandated analyses during the days of the *Commission* and later the *Société* tend to support the argument that these institutions represented a certain revival in the science of mineral waters. Thanks to their active network and regulation, they managed to rouse the interest of numerous physicians who felt invested in their mission of correspondents, and therefore produced more scientific material on mineral waters.

Finally, the focus on controversy and on advertisement, which collectively show up in a large number of analyses, shows just how sensitive the subject of waters could be. The economic value and administrative quarrels around the administration of waters have been discussed at length in previous chapters, but this is another reminder of how present they were, even in scientific texts about mineral waters.

## The scientific networks of the analysts

The exploration of motivations show that chemical analyses were often moved by exterior forces. In particular, the motivation of a number of analysts to right the wrongs of previous attempts demonstrate a certain awareness that analysis was rarely done without knowledge of prior works. In addition, the fact that two authors could be credited for the making of a particular analysis shows that this scientific endeavour did not have to be done alone. A closer read of the analyses confirms this. The reports constantly referred to prior publications. These mentions were at times neutral, the analyst simply flagging his awareness of a previous treatise. Laprade in his analysis of the waters of Vals, mentions an analysis done by the chemist Mitouard, without going into much detail regarding his results.<sup>854</sup> The analysts of the waters of Mammont mentioned that the waters had been previously analysed by Vauquelin.<sup>855</sup> Other times, previous work could be referred to in order to solidify the results of the current work. The analyst of the waters of Capbern for example, when sending his results to the *Commission*, specified that those waters had been previously analysed by Mr. Monteau, and both analyses were in accordance.<sup>856</sup>

Waters that were very popular with analysts also received mentions of that kind. The apothecary Machy in his analysis of the waters of Passy, found some differences with the recent analysis made by Venel and Bayen. He therefore described their method, in order to support his theory that changing seasons were at the origin of this discrepancy.<sup>857</sup> Half a century later, the new analyst of the Passy waters, Deyeux, explained that these waters had been analysed

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<sup>854</sup> Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL.

<sup>855</sup> Analysis of the waters of Mammont by Chaussier and Deyeux, (1809), AJ/16/6698, AN.

<sup>856</sup> Analysis of the waters of Capbern by Brun, (1778), SRM 113, dossier 12, ASRM.

<sup>857</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 20.

more times than one could count, again showing awareness of participating in a long line of analysts by summarising the results, findings and errors of many decades of research on these waters.<sup>858</sup> The same could be said of the waters of Enghien which received numerous analyses too. When the commissaries of the Faculty reported their work, they stated that in order to avoid repetitions, they would only focus on new findings.<sup>859</sup>

Such mentions suggest that most analysts had some idea of the state of research on the waters they wrote about. In one case, the analyst of the waters of Saint Galmier even mentioned an analysis report that had yet to be published, showing that discussions on upcoming works on mineral waters took place, for example at the meetings of scientific institutions. That same analyst said that other than this upcoming work from his colleagues at the Academy of Lyon, most previous analyses of that particular water had been made by people who were more “historians” than chemists, hence making his contribution valuable.<sup>860</sup>

Pointing out past errors in analysis was, as mentioned above, a common motivation. Even when it was not described as the sole factor, mentioning previous analyses only to point out their failings was common in the reports. Two analysts complained that their predecessors had limited their enquiry to transported waters, without traveling to the spring. This point was cited as a reason why these previous works should not be fully trusted. Those waters were known to lose all healing properties in transport, which the analysts claimed was the reason why repeated analyses had never come to a consensus on the water’s composition.<sup>861</sup>

Two separate analysts mentioned the insufficient prior research conducted by Duclos and Chomel. One complained that they had failed to mention the properties of the waters, the other that they had wrongfully interpreted the experiments showing the existence of a nitrous salt.<sup>862</sup> Duclos was also decried by yet another analyst, who complained that his results on the waters of Sainte Reine were completely inconsistent with the kinds of remedies that could be

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<sup>858</sup> Nicolas Deyeux, “Analyse des nouvelles eaux minérales de Passy, communiquée à l’école de médecine de Paris,” (Extrait de la collection des mémoires de cette école, dont le premier volume paraîtra incessamment, à Paris, chez Méquignon l’aîné, 1808)., 1.

<sup>859</sup> Fourcroy and Delaporte, “Analyse chimique de l’eau sulfureuse d’Enghien, pour servir à l’Histoire des Eaux sulfureuses en général.”, chapitre 2, 11–36.

<sup>860</sup> Laprade mentioned being aware that the physicians Willermoz and Lilia have recently analysed the same waters, but despite their upcoming work, more analysis is always worth the effort. Analysis of the waters of Saint Galmier by Laprade, (1774), Ms 120, f282–283, AAL. “Comme chaque artiste considère les objets sous une face différente j’ai crû que des efforts multipliés quoique séparément, contribueraient à arracher à la nature le voile dont elle se plaît à s’envelopper dans les eaux minérales.” Les auteurs qui ont parlé de ces eaux sont plus “historiens” que “chymistes”.

<sup>861</sup> Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL.; Thouvenel, “Mémoire chimique et médicinal sur les principes et les vertus des eaux minérales de Contrexeville en Lorraine.”, xii–xiii.

<sup>862</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL.; Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM.

obtained from the waters.<sup>863</sup> This is worth noting, as it denotes the power that large surveys of different waters could have. They could help in capturing the attention of future “chemists and naturalists” who were vindicated to set the record straight on the precise qualities of the waters.<sup>864</sup>

These complaints show the level of scrutiny with which the analyses of peers could be read. Maret, in his 1781 analysis of the waters of Sainte Reine, explained that some of his experimental work was tailored-made to address some of Fourcroy’s mistakes, who had also previously analysed the waters. He explained: “The dissolution of insoluble earth in the acetic acid and operated by muriatic acid has then been the object of an examination all the more serious that M. Fourcroix having not suspected [to find] any iron has not believed he ought to submit this earth to any experiment.”<sup>865</sup> The analyst Morell, in his work on the waters of Habsbourg, wrote in a very similar fashion. His 1788 analysis appears to have been written almost entirely in opposition to the bad example of the previous book on the subject. He cited the reprobate colleagues, and inserted comments, the likes of “how can one, without absurdity or without resolute ignorance draw such conclusions”.<sup>866</sup>

Despite not belonging to a guild structure, or rarely sharing dedicated institutions (the *Société* Associates were not representative of the vast majority of analysts), many analysts did not act alone during the process of analysis. When an analyst was mandated by an institution to analyse a water, this indicated the existence of prior contact.<sup>867</sup> Analysts also interacted with one another through their work. A concrete example of this can be found in the report on the waters of Pouët. Gallot, in his report, asked for some information from the *Société*. He expressed interest in the new analytical methods of Parmentier and Fourcroy, and asked if someone at the *Société* would be willing to send him a complete list of the reagents they recommended using during analysis. A few paragraphs later, he suggested his own methodology, based on a lower heat and a more frequent use of decantation.<sup>868</sup> This kind of report shows the attitude analysts who were willing to trade information with their colleagues

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<sup>863</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

<sup>864</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL. “elles m’ont pourtant parû mériter l’attention des chymistes et des naturalistes”.

<sup>865</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM. “La dissolution de la terre insoluble dans l’acide acéteux et opérée par l’acide muriatique a été ensuite l’objet d’un examen d’autant plus sérieux que M. Fourcroix n’y ayant pas soupçonné de fer n’a pas cru devoir soumettre cette terre à aucune epreuve.”

<sup>866</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM. “quelle conclusion sans aucune preuve !”, “peut on sans absurdité, où sans ignorance décidée tirer de pareilles conclusions”.

<sup>867</sup> When Chifoliau was asked to remake his analysis of the waters of Saint Suliac, and to improve on a few technical points, he knew that he was in a sense, not alone in the process, and could be in touch with the *Société* regarding any obstacles that he faced. Analysis of the waters of Saint Suliac by Chifoliau, (1781), SRM 92 B, dossier 49, ASRM.

<sup>868</sup> Analysis of the waters of Pouët by Gallot, (1784), SRM 91A, dossier 13, ASRM. “Il demande l’avis de la société sur un moyen nouveau qu’il propose pour l’examen des eaux.”

in the field.<sup>869</sup> In another similar case, the owner of the Orléans waters cited the latest issue of the *Journal Historique*, in which it was announced that “the analysis of mineral waters of which the King has attributed the knowledge to the Société is one of the objects which it intends to follow with the most activity; in consequence [the Société] has believed it necessary to publish an exact and simple method of analysis”.<sup>870</sup> The owner asked where he might be able to buy this book, so that he might put it to good use on his waters.

These interactions challenge the vision of a very pyramidal hierarchy of power between the Société’s authority and the provincial analysts. At least from the point of view of some analysts, the relationship was more equal than might appear, and sending an analysis to the Société was not always seen as an examination one had to pass, but rather as an exchange of knowledge in which both parties had a potential to learn.

Some analysts also indicated the help they received when they visited a spring on the invitation of the owner or the intendant. One mentioned for example having been invited by the local physician.<sup>871</sup> In such a case, the physician in question would likely have provided help with the description of the waters’ surroundings, and potentially some of their remedial qualities.<sup>872</sup>

Through the practice of giving credit, it also becomes apparent that many analysts solicited help when they needed it. One analyst recalled enlisting the help of his father when performing the analysis.<sup>873</sup> The author of the report on the waters of Charbonnières credited the late Maret, to whom he had previously sent thirty bottles of water, and who had initially contacted him about the unique nature of its residue.<sup>874</sup> Credit was also given to anyone who had been present during the experiments as a witness. Méglin mentioned the company of “several enlightened people, particularly Mr. Beltz, my Colleague, &

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<sup>869</sup> Analysis of the waters of Pouët by Gallot, (1784), SRM 91A, dossier 13, ASRM.

<sup>870</sup> Correspondence from Orsel to the Société, (4<sup>th</sup> October 1778), SRM 91 A, dossier 2, pièce 9, ASRM. “Le dernier journal hist. annonce ; “que l’analyse des eaux minerales dont le Roi à attribué la connoissance à la Société est des objets qu’elles est dans l’intention de suivre avec le plus d’activité ; en consequence elle a cru necessaire de publier une methode d’analyse exacte et simple qui en servant de modele suffira dans presque tous les cas”. cet ouvrage me seroit très utile dans ce moment pour apprecier une nouvelle source minerale que je viens de decouvrir.”

<sup>871</sup> Gavinet mentioned coming at the request of a colleague. See: Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. À la demande d’un “confrère”.; Gallot came at the invitation of Richard, a physician in Montaigu. See: Analysis of the waters of La Touche by Gallot, (1784), SRM 91A, dossier 13, ASRM.

<sup>872</sup> One example of a report shows a physician taking advice from his uncle, who innovated a new bathing method, and encouraged his nephew to pursue mineral water analysis. See: Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

<sup>873</sup> Correspondence to the Société, (1779), SRM 91 A, dossier 7, ASRM.

<sup>874</sup> M. de Marsonnat, “Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais,” (A Lyon, de l’imprimerie de la ville, 1789).

my friend, who has been willing to help me in some of my attempts”.<sup>875</sup> Another analyst brought a physician, a surgeon, and a few other witnesses to come with him at the spring and witness his experiments.<sup>876</sup> Appreciation was also dispensed towards people who had helped during the analysis, either in sourcing the necessary instruments,<sup>877</sup> or by giving testimonies of the efficiency of the waters<sup>878</sup>. Help could be granted by a local physician, or apothecary, as was the case for the waters of Labatisse, where the analyst solicited the help of Mr. Chappel, a “celebrated apothecary and chemist of this city”.<sup>879</sup>

When help was not present at the spring, the analyst could travel alone to the spring and bring back puzzling results to their colleagues at the local academy, faculty of dispensary.<sup>880</sup> Some analysts expressed disappointment that they could not solicit the help of local medical knowledge. The analyst of the waters of Martres wrote about his chagrin that no local physician could give him examples of the effects of the waters, and that his conjectures on the subject would therefore not be illuminated by the “beacon of experience”.<sup>881</sup> Some analysts did not hesitate to ask for multiple opinions on the waters in their locality. The analyst of the waters of Usat brought numerous testimonies from the physician in charge of the waters, but also from the local priest, the innkeeper and a number of patients at the spring.<sup>882</sup>

These mentions all show rather definitively that being an analyst was not an isolated activity. The analysts showed keen awareness of previous research on the waters they were analysing. They sometimes viewed these previous attempts with scepticism, but the fact that they positioned themselves against them still highlights the collaborative nature of the analytical work. Many analysts also received help, whether it be from a local physician, a family member, a colleague in an institution, or just a knowledgeable person at the spring. They had a consistent habit of giving credit to those who had helped in the process, even sometimes recommending their good services to the *Société* or other institutions.

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<sup>875</sup> Méglin, “Analyse des eaux minérales de Sultzmat en Haute Alsace.”, 5. “ces expériences furent faites en présence de plusieurs personnes éclairées, particulièrement de Mr. Beltz, mon Confre, & mon ami, qui a bien voulu m’aider dans une partie de mes tentatives ;”

<sup>876</sup> Analysis of the waters of Pouzauges by Gallot, (1784), SRM 91A, dossier 13, ASRM.

<sup>877</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM.

<sup>878</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

<sup>879</sup> Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM. “apothicaire et chimiste célèbre de cette ville”. A similar case can be seen, when Bo solicited the help of Bougues, in Aurillac to do a large portion of the analysis. In turn, he recommended his skills to the *Société*. See: Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM. Bougues mérite “la reconnaissance de la société royale.”

<sup>880</sup> Bertrand-Lagrésie requested the help of M. Montet, a chemist in Montpellier, as he stated that he could not count solely on his own “lights”. See: Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

<sup>881</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “flambeau de l’expérience”.

<sup>882</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

## Disclosing intellectual influences by citing peers

So far, I have attempted to outline the kinds of people who would have been of practical help during the process of analysis, and I aimed to show all the resources available to analysts as they attempted to get information on a water. Another level of the network of analysts can be discerned through the citations that were made in order to support intellectual claims. For example, an analyst might mention using a method credited to a certain author, or use the interpretation of another. There could be a fine line between the two. Some chemists were cited for their works in the field while also being of practical help to some analysts. The most notable example of a person playing both of these roles was the analyst Venel.

The prolific author of most of the work on chemistry in Diderot's *Encyclopaedia* was one of the most often cited references in the corpus of mineral water analysts. Unlike Hoffmann or Monnet, who both wrote influential treatises on the subject of mineral waters, Venel never published his results.<sup>883</sup> But despite this lack of publication, and a sometimes unconventional approach to water analysis, the Montpellier chemist was cited constantly. He was mentioned once for his course in chemistry, by an author recalling his studying days and attempting to explain a bewildering result.<sup>884</sup>

In other instances, Venel was mentioned for his contributions to air chemistry. One of the analysts justified his conclusions by modelling it on an interpretation made by Venel,<sup>885</sup> another simply cited him as one of the great innovators on the topic, in a very short list of names,<sup>886</sup> while a third quoted his theory which proposed that the effervescence of acids was not a sure proof for the alkaline nature of a water.<sup>887</sup> One of the Passy analysts mentioned the visit of Venel and Bayen at the spring, and used their conclusions as a way to support wider positive claims about the waters. He said: "The skilful Analysts (Sirs Venel & Bayen) conclude that these Waters can be regarded as singular & truly unique." He also described Venel's heated criticism of Hoffmann as being perhaps a little exaggerated; Hoffmann was thought of as a reference in his own right. But this is one of the interesting things about Venel, he was a rather opinionated character in the world of mineral water analysis, one that was perceived as such by others.<sup>888</sup> The author also mentioned Venel's

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<sup>883</sup> The reasons for this have been described in chapter 3.

<sup>884</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM. Note qu'il se souvient de ses cours avec M. Venel, "leçons particulières de chimie".

<sup>885</sup> Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM.

<sup>886</sup> Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

<sup>887</sup> Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL.

<sup>888</sup> Machy, "Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.", 20. Citing an extract from the *Journal des Scavants*, 7, 17. "Les habiles Analystes (MM. Venel & Bayen) concluent que ces Eaux peuvent être regardées comme singulières & véritablement uniques. Ils soutiennent, trop généralement peut être, que les diverses Eaux Médicinales qu'on a données pour vitrioliques ne le sont point, & même s'élèvent contre

contribution to the theory of airs in waters. In conclusion, he expressed his enthusiasm at Venel's upcoming treatise of the mineral waters of France, "We can already see by this Analysis which is so precise & knowledgeable, what we can expect of his works on all the Mineral Waters of France."<sup>889</sup>

He was not alone in waiting for Venel's treatise in anticipation. Several analysts made mention of their eagerness to see his results, stating that "good things are expected of it".<sup>890</sup> Others regretted "the kind of inaction in which he seems to have fallen", and expected Venel to "carry the light in this important matter".<sup>891</sup> The analyst Gavinet added that it was the lack of rigour of other chemists which made the French analysts wait with such "impatience the great work of M. Venel".<sup>892</sup>

After the comedy of errors that led to the disappearance of Venel's manuscript, many analysts mourned the loss of his work. The analyst of the waters of Manosque expected Venel to visit his spring. Upon learning of his passing, the analyst said: "by death, chemistry lost [...] a great man, and manosque [lost] the analysis it had expected from him."<sup>893</sup> Sadness over the loss of the manuscript was even expressed by influential chemists outside of France, such as Bergman who mentioned Venel in his treatise on mineral waters.

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Hoffman, & ceux qui d'après lui ont admis dans plusieurs eaux ferrugineuses un vitriol ou un principe marital volatil." The same journal reaffirmed the place of Venel as the first to establish the difference between aerated and acidulous waters: "C'est M. Venel qui a fait cette observation, & qui a découvert le premier qu'il y a dans les Eaux aérées, comme celles de Seltz, un piquant qui en impose quelquefois pour de l'acide, & qui ne vient que de l'air surabondant."

<sup>889</sup> Ibid, "On voit déjà par cette Analyse si précise & si sçavante, ce qu'on doit attendre des ses travaux sur toutes les Eaux Minérales de France."

<sup>890</sup> Monnet, "Traité des eaux minérales avec plusieurs mémoires de chimie relatifs à cet objet.", xviii. "Enfin, M. Venel fut proposé pour l'Analyse des Eaux Minérales du Royaume ; & l'on présuma, par les talens qu'on lui connoissoit, qu'il éclairceroit cette partie. Son ouvrage, fort désiré, n'a pas encore paru (en 1767; ) mais on en augure bien, en considérant qu'il a déjà donné deux Mémoires sur les Eaux de Seltz à l'Académie Royale des Sciences, qui se sont insérés dans le second vol. des Savants Etrangers, que l'on peut appeler deux chef d'œuvre en ce genre."

<sup>891</sup> Priestley, "Manière d'imprégner l'eau d'air fixe, et de lui communiquer les propriétés de l'eau de Pyrmont, et de toutes les eaux minérales qui sont connues sous el nom d'acidules ou Aériennes.", 10. "C'étois à M. Venel, (dont les talents supérieurs pour la Physique & pour la Chimie, font regretter tous les jours l'espece d'inaction dans laquelle il semble être tombé,) qu'il étoit réservé de porter la lumière dans cette importante matière."

<sup>892</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284-287, AAL. "nous n'attendrions pas avec autant d'impudence le grand ouvrage que M. Venel, professeur en médecine de Montpellier, chargé par la cour de l'analyse des Eaux minerales de France nous fais esperer ;"

<sup>893</sup> Analysis of the waters of Manosque by Bouteille, (between 1780 and 1793), SRM 90A, dossier 4, ASRM. "j'ay fait quelques experiences chimiques sur ces eaux mais je n'ay jamais entrepris d'en faire l'analyse. je sais que pour etre bien faite, il faudroit une main plus exercée que la mienne qui s'en occupa. je voulois l'avoir de main de maître, et en consequence M. venel au retour des eaux de Digne, passant par manosque en 1772, je m'adressay a luy. il eut la bonté de me promettre d'analyser cette eau, et il me chargea de luy faire parvenir le residu d'une distillation de 14 tt de cette eau faite dans une cornue de verre. par la mort la chymie perdit bientôt après un grand homme, et manosque l'analyse qu'elle attendoit de luy."

It is to be lamented that this very acute chymist who superintended the examination of the waters in France, did not publish anything more upon that subject before his death.<sup>894</sup>

The French analysts had lost one of their beloved members and the entirety of his work.<sup>895</sup> Thankfully, Venel was not the only author who had knowledge of water analysis, and other names were just as regularly cited as having made important contributions.<sup>896</sup>

One report stands out in that regard. The analysis of the waters of Noyers written by physician René Gastellier (1741–1821) was exceptionally well-referenced, even including footnotes with the title of the works cited. This was notable since the analysis was a manuscript, and handwritten reports rarely included precise references. A passage would for example state:

following mr fourcroy whose authority is with justice respected in chemistry, the foye of sulphur precipitates martial vitriol in a blackish powder; this precipitate according to this celebrated chemist is a kind of martial pyrite. (a)

(a) Elem. de ch. p 287. tom 3. [i.e.: *Éléments de Chimie*, page 283, volume 3]<sup>897</sup>

The manuscript also included notes referring to Monnet, Bergman, Scheele and several other “celebrated chemists”.<sup>898</sup> While not all analysts were so well-read as to be able to describe the differences in conceptions of saltpetre between those of Bergman and Scheele, many still demonstrated awareness of the important names of the field.

The First physician Raulin was often cited thanks to his works on the French mineral waters, as a lesser but usable substitute to Venel’s lost work.

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<sup>894</sup> Torbern Bergman, “Physical and Chemical Essays,” (London, Printed for J. Murray, n°32, Fleet-Street; and William Creech, Edinburgh, 1784), 107.

<sup>895</sup> An additional mention from an analyst simply stated that the work done by Venel and later Le Roy must be “precious”, but explained that it was still in the works, and that its publication would be an important contribution. Correspondence from Girard to Vicq d’Azyr, (5<sup>th</sup> May 1781), SRM 93B, dossier 30, ASRM. “feu M venel et le Roi si recommandables par leur savoir, avoient été successivement chargés par le Ministère pour mettre la dernière main à cet important ouvrage. Les manuscrit que ces deux professeurs ont laissé sur cette matiere doivent etre précieux.”

<sup>896</sup> The analyses from the later part of the period of study were more likely to cite their sources if they were manuscripts. Most printed works tended to cite a variety of authors. Many included a long historical description of analyses since Boyle. This makes for a large number of citations which have not been systematically categorised here. The following names are the ones that frequently appeared in both printed and manuscript analyses.

<sup>897</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “suivant mr fourcroy dont l’autorité est avec justice respectée en chimie, le foye desouffre precipite le vitriol martial en une poudre noiratre; ce precipite suivant ce celebre chymiste est une espece de pyrite martiale. (a) Elem. de ch. p 287. tom 3.”

<sup>898</sup> Ibid, “Il faut en croire les plus celebres chimistes tels que M.M. monnets, Lanef[?], Rouelle, Bergman, et plusieurs autres”.

A few of those mentions actually criticised Raulin's lack of precision. Laprade for example was discontent with "the declamations of M. raulin who cannot be persuaded that a mineral water can be charged with a higher quantity of air than common water."<sup>899</sup> Raulin was also mentioned as someone who was not aware of the existence of springs below atmospheric temperature.<sup>900</sup> Often though, he was simply mentioned as a previous analyst, since he had travelled and analysed many waters.<sup>901</sup>

As hinted at earlier, Hoffmann was also a frequent mention, almost always because his analysis of the waters of Germany, which served as a reference for many chemists and analysts.<sup>902</sup> Beltz claimed that Hoffmann was the founder of mineral water science,<sup>903</sup> while others simply quoted some of his claims.<sup>904</sup> Méglin cited Hoffmann's description of the rare presence of copper in some mineral waters of Hungary.<sup>905</sup> In addition, Chevalier in his altercation with the physician Pomme used the fame of Hoffmann in order to refute Pomme's arguments, stating "This odious accusation is so well-refuted by this great master [Hoffmann], that I believe I must report here what he said on the subject, in order to *convince the misbelievers, & to open the eyes of the voluntary blind.*"<sup>906</sup>

Priestley featured a number of times, in later analyses. He was always cited in regards to his theory of airs.<sup>907</sup> Boerhaave got a mention as someone to whom "medicine and physics has such great debts",<sup>908</sup> while Macquer was cited for his "beautiful discoveries of modern chemistry".<sup>909</sup> Rouelle was

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<sup>899</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL. "il nos suffit de savoir que cette eau est aérée, opinion que nous embrassons malgré les déclamations de M. raulin qui ne peut se persuader qu'une eau minérale puisse se charger d'une plus grande quantité d'air que l'eau commune. nous pourrions faire beaucoup d'objections contre son esprit voltail éthéré mineral, mais nous nous proposons d'en parler dans un ouvrage particulier."

<sup>900</sup> Marsonnat, "Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais."

<sup>901</sup> Correspondence from Dufour to the *Société*, (1783), SRM 90 A, dossier 23, ASRM.

<sup>902</sup> Hoffmann, "Nouvelles expériences et observations sur les eaux minérales de l'Allemagne ... traduites du célèbre Frédéric Hoffmann."

<sup>903</sup> Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

<sup>904</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL.; Analysis of the waters of Bouillaut by Fleury l'Aîné, (1776), SRM 91B, dossier 33, ASRM.

<sup>905</sup> Méglin, "Analyse des eaux minérales de Sultzmat en Haute Alsace.", 14.

<sup>906</sup> Chevalier, "Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques.", 13. "Cette imputation odieuse est si bien réfutée par ce grand maître [Hoffmann], que je crois devoir rapporter ici ce qu'il a dit à ce sujet, afin de *convaincre les mécréans, & d'ouvrir les yeux aux aveugles volontaires.*" (The emphasis is in the original text.)

<sup>907</sup> Laprade specified that he used his method in order to analyse the airs of the Vals waters. Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL.

<sup>908</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL. "a qui la medecine et la physique ont de si grandes obligations".

<sup>909</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. "belles découvertes de la chimie modernes".

credited for his experiments with neutral salts,<sup>910</sup> Bucquet for his theory that countered one of Macquer's claims,<sup>911</sup> Monnet for his classification, along with Stahl, Boyle, Bohn, Boulduc, Morveau, Carrère, and many more for their various contributions to mineral water chemistry. Overall, the *savants* who were cited in the reports are too numerous to cite exhaustively. Most of these mentions were not gratuitous. They were made in support of a particular point in the analysis. Often, the analysts were looking for a point of comparison. Since, as shown earlier, most analysts did not make many analyses in their lifetime, the only comparisons were to be found in the books of other specialists. This is likely why the treatises of Monnet and Hoffmann featured so often, they allowed the analysts to place their study within a broader set of analyses on European waters.<sup>912</sup>

The end of the period showed a rise in the citations of Swedish chemist Torbern Bergman (1735–1784). I believe that those mentions are of particular importance, because unlike the other authors that made their way in the analysis reports, Bergman was almost always cited as a methodological reference.<sup>913</sup> While some did mention the quality of Hoffmann's first method, or borrowed elements of methodology from various noteworthy chemists, Bergman was perhaps the only name to be cited consistently as the source for the entire analytical methodology.<sup>914</sup> Nicolas, in his analysis of the waters of Uriage, mentioned in a note at the end of his report that he had been applying the method of Bergman, the "famous chemist of Upsal", and that he planned to use it in all subsequent analytical works.<sup>915</sup> Fourcroy<sup>916</sup> described the method of Bergman, of which he used a modified version, as a return to a simpler but more sensible way of analysing waters. Fourcroy occasionally made critiques of Bergman's interpretations, while still referring to him as an

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<sup>910</sup> Machy, "Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.", 10.

<sup>911</sup> Méglin, "Analyse des eaux minérales de Sultzmatt en Haute Alsace.", 17.

<sup>912</sup> Regnault referred to Monnet's work, and concluded that the waters he analysed were close in composition to those of Aix la Chapelle. Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM.

<sup>913</sup> Gurdon and Plusaignes also mentioned using the method of Bergman for their analysis. Report on the analysis of the waters of Ruillé, AJ/16/930/A, AN.

<sup>914</sup> Bergman might have been cited liberally in part because he was a Swedish chemist, and therefore posed no nationalist threat to the French analysts. They would not have been likely to prop up a British chemist in the same uncritical way, but France's diplomatic relations with Sweden being much calmer, Bergman could be featured as a reference.

<sup>915</sup> Analysis of the waters of Uriage by Nicolas, (1783), SRM 93A, dossier 12, ASRM. "N. B. nous avons suivi & nous suivrons desormais dans tous nos Memoirs sur les Eaux minerales du Dauphiné, la Methode du celebre m. Bergmann Professeur de Chymie à upsal;".

<sup>916</sup> Fourcroy analysed the waters of Enghien along with Delaporte. It seems however that Fourcroy was the lead author of the report. He was credited as first author, and others in the field referred to the analysis as Fourcroy's work. For this reason, I will refer to the Enghien analysis as Fourcroy's analysis.

authority in the field.<sup>917</sup> Morell in 1788 also explicitly used the method. When pointing out a result of his analysis, he sadly exclaimed that “even Bergman” had fallen to a wrong interpretation of the phenomenon.<sup>918</sup> Two other analysts explicitly said that they were using a variant of the method of Bergman, augmented by the experiments of Giovanetti.

One analyst, curious about the effects of salts on health, and particularly salts extracted from mineral waters, consulted “the oracles of antiquity” on the matter, namely Hippocrates and Pliny. He also called on to Agricola, Libavius and other slightly more recent references.<sup>919</sup> His analysis dates from 1718, so he obviously did not have the opportunity to consult a not yet born Venel on the question. But this habit of quoting ancient authors in order to explain the nature and effects of waters was not to last much longer. As early as 1723, the analyst of the Passy waters claimed that waters were known to be useful, a fact established beyond the need to cite the authorities, meaning the ancient authorities.<sup>920</sup> In a 1750 analysis of the waters of Bussang, the author said that if the ancients had known anything about mineral waters, they had left nothing but a “deep silence” on their usage.<sup>921</sup> Later on, he credited Hoffmann as the founder of an approach that was based on more reliable foundations than those of “Analogy” and “a sort of Empiricism”.<sup>922</sup>

One could not reasonably disagree, that we have made some progress in the knowledge of the mineral Waters, since the beginning of this Century. Monsieur Hoffmann, to whom we owe a method to Analyse these Waters; [...] has dissipated a large part of the darkness, that ancient prejudices had spread on this matter;<sup>923</sup>

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<sup>917</sup> Fourcroy mentioned for example that the French chemists were more advanced than Bergman on specific questions, like the study of the hepatic air. He still cited Bergman throughout his analysis on dozens of occasions. Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 113. “Les chimistes français, plus avancés que Bergman sur la nature & la composition du gaz hépatique, expliquent autrement cette précipitation du soufre.”

<sup>918</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM. “Je separai, à la methode de Bergmann, dans le laboratoire de Mr de S... les parties volatiles de trois bouteilles d'eau de Schinznacht, il en passa 41 pouces cubes”; “C'est encore une preuve incontestable, de l'erreur où sont tombés Westrumb, Struve et même Bergmann, qui ont adopté l'opinion, que la dissolution de sublimé corrosif melée avec de l'eau sulphureuse, se précipite en noir, et que melée avec de l'eau gazosulphureuse le sediment ne prend qu'une couleur jaune.”

<sup>919</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “les oracles de l'antiquité”.

<sup>920</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, 5. “il seroit inutile de citer des autoritez”.

<sup>921</sup> Lemaire, “Essai analitique sur les eaux de Bussang.”, 7. “profond silence”.

<sup>922</sup> Ibid, “Ainsi la connoissance des Eaux minerales nouvellement découvertes au village de Passy, près Paris, n'étoit pas possible de tirer des consequences utiles même par Analogie. Comme on ignoroit entierement que l maniere dont on faisoit usage de ces Eaux put contribuer à leurs effers, qu'on ne soupçonnoit même pas quelle put les faire varier ; on ne suivoit aucune methode constante & uniforme; ce qui néanmoins étoit d'une necessité absoluë, pour pouvoir debrouïller ce cahos.”

<sup>923</sup> Ibid, “On ne sçauroit disconvenir raisonablement, qu'on n'ait fait quelques progrès dans la connoissance des Eaux minerales, depuis le commencement de ce Siècle. Monsieur Hoffmann,

The analyst Beltz, clearly in agreement with the claim that Hoffmann had founded mineral water science, also claimed that anything written before him was hardly worth the paper it was printed on.<sup>924</sup> The analyst of the waters of Quercy made a very similar point in his report. Referring to an older analysis of the waters, he stated: “the most enlightened chemists of that time are not to be compared with the mediocre of this century”.<sup>925</sup> Finally, the analyst of Segray made a particularly eloquent point about progress. He described how ancient chemists had been trapped in their obsession of “finding the philosopher’s stone”, working tirelessly and at great expenses towards this unattainable goal. This idea, he believed “could only occupy brains burned by the flame of furnaces; blackened by its vapours”. He did not have many kind words towards the old chemists. In comparison, the modern chemists relied on “sane physics”, leading them to incredible feats in the manipulation of matter. In his view, modern chemistry had been “enlightened by the errors of the ancients”, and this was the ancients’ only positive contribution.<sup>926</sup> More often than not, mineral water analysts believed they could only rely on colleagues of their own century for support, and they proudly displayed their belief in the feats of modern chemistry in their reports.

## Chemistry, medicine, and personal sentiments: the contents of the reports

An analyst’s report typically contained several sections. The most important part was obviously the chemical analysis itself, that is to say the description of the chemical experiments and their interpretation. This was the *raison d’être* of any report. The steps of chemical analysis will be described in detail in the next chapter, but for now, I will intentionally leave out the analysis itself to instead focus on the other sections. A report typically included an

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à qui nous avons l'obligation d'une méthode d'Analyser ces Eaux; sur laquelle D. Shaw a fait d'excellentes Notes ; a dissipé une grande partie des ténèbres, que les anciens préjugés avoient repandus sur cette matiere ;”.

<sup>924</sup> Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

<sup>925</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. “deux des sources cÿ dessus ont deja esté analysées depuis 60 ans, mais javanceraï en meme temps que les chimistes les mieux éclairés de ce temps nestoient point a comparer avec les mediocres de ce siecle”.

<sup>926</sup> Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM. “si les chimistes modernes éclairés par les erreurs des anciens ne l'en avoient tirée par des découvertes an dessus de tout éloge qu'elle difference de travail, qu'elle differance de lumière ; si nous comparons en passant, les uns aux autres : la plupart des anciens entetés de sa possibilité de trouver la pierre philosophale ; travaillant a grands frais pour découvrir cette merveille au dessus de toute recherche raisonnable ; cette idée ne pouvait occuper que des cervelles brulées par l'ardeur des fournaux ; noircies par ses vapeurs ; les modernes à l'appui de la saine physique, & de ses moyens s'occupent à séparer les differantes substances dont les mixtes sont composés, a les purifier, les exalter, et même à les rassambler ;”.

introduction, in which the analyst discussed a variety of things, from his motivation to perform the analysis to particular problems at the spring. In the case of printed analyses, this introduction was often more formal and included a historical discussion of analysis, or of the water itself.<sup>927</sup> The introduction section in the manuscripts was often much shorter, and counterintuitively, the contents of this ‘introduction’ were sometimes placed at the end of the manuscript.

### *Discussing the medical properties of waters*

The other important section that was included in most reports was the medical discussion. As the medical theory and uses of mineral waters in the eighteenth century is not the subject of my thesis, I will not be giving a detailed description of the complex system which dictated what diseases were cured by which waters. But it would be amiss not to mention that medicine was a large part of many analytical reports. In the case of printed works, it could cover hundreds of pages. In the manuscripts, the medical description of the water could range from a few lines to dozens of pages.

Some analysts stated that, although analysis was ultimately done for the benefits of the patients, their job was not to discuss the medical properties of the water. Laprade, despite being a physician, stated in his analysis: “the properties of the waters of Vals are too well-known for me to mention them in this analysis. all physicians know that they are purgative, un-obstructing, tonics and diuretic.”<sup>928</sup> That was the entire extent of his medical description. This was by no means a dismissal of the water’s remedial effects. On the contrary, Laprade simply believed that empirical studies on the effects of the waters of Vals were sufficient, and only the chemical analysis remained to be improved.<sup>929</sup> When medical information was unavailable, which happened in the case of newly discovered waters, the medical discussion could be rather short. In addition, when the author were not physicians, they sometimes carefully avoided making any strong claims regarding the medical uses of the waters,

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<sup>927</sup> This was not systematically the case. The printed analysis of the waters of Trye le Château started directly with the analysis, following the address. But in other cases, like the analysis of the waters of Enghien by Fourcroy, the introduction itself was fourteen pages long and included a full table of the chemicals used in the analysis. Fourcroy, “Analyse des eaux alkalino-martiales de Trye-le-Chateau avec l'exposition de leurs propriétés faite par M. Fourcroy, Faite sous les yeux de M. Raulin.”; Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, chapter 1, 1–10.

<sup>928</sup> Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL. “les proprietes des eaux de Vals sont trop connues pour que j'en fasse mention dans cette analyse. tous les medecins savent qu'elles sont prugatives, desobstruantes, toniques et diurétiques.”

<sup>929</sup> The same kind of comment was also made in the following analysis: Analysis of the waters of the Aveyron by Caucanas, (1802), AJ/16/6697, AN. “quant aux propriétés médicales, tant de cette dernière eau que de celles de canarès, ces eaux possèdent éminement les vertus communément attribués aux mêmes espèces d'eaux répondantes sur le sol de la République, propriétés trop connues de l'assemblée pour qu'il soit nécessaire de les rappeler ici.”

as this could be seen as overstepping the boundaries of their prerogatives as apothecaries or surgeons.

When a medical discussion was included, it could take different forms. The *Commission*, for example encouraged the production of medical topographies, meaning regional descriptions of present and past diseases and epidemics, coupled with a description of the local climate that might help physicians in discovering the origins of epidemics. Such topographies were sometimes found attached to the chemical analyses of mineral waters.<sup>930</sup>

These inclusions were however not found in the majority of reports. The more common occurrence was a straightforward discussion of the effects of the water. They were done with varying degrees of precision. For example, the analysis by Lassone and Cadet listed each known remedial quality of every mineral found in the water.<sup>931</sup> In other instances, the analyst would instead talk about the diseases that were best cured by the water. Caucanas, in his analysis, noted instead that the waters were especially suitable for diseases of the mind, particularly those that are difficult to heal as “one does not suspect that one is afflicted by them.”<sup>932</sup>

In other cases, the analyst simply listed examples of cures that had resulted from using the waters. The report on the waters of Usat for instance listed a number of anonymised cases of people being healed, before ending with the case of the analyst himself, who claimed that the waters had calmed his recurring stomach pain.<sup>933</sup> The analysts also described the best ways of using the waters. In the treatment of skin conditions, the waters could for example be mixed with specific earths in order to produce mineral muds.<sup>934</sup> When the analyst was a physician, he would add precise recommendations on the best way to take the waters, suggesting the amount that should be drunk, or the diet that was most often correlated with successful recoveries.<sup>935</sup>

As they knew that the analyses would be read by some of their colleagues, the analysts included observations that could be of interest to them. One analyst theorised that all waters had remedial properties, describing at length why

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<sup>930</sup> See for example the analysis of the waters of Ambert, which includes a discussion on the climate, the kinds of fevers that plague the region, and estimation of the number of people affected. The topography also discussed the constitution of people, the aspect of the landscape, and the typical employments of the inhabitants. All such information was relevant in the study of disease and its link to the environment. See: Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL.

<sup>931</sup> Analysis of the waters of Roye by Lassone and Cadet, (earliest 1770), SRM 91B, dossier 32, ASRM.

<sup>932</sup> Analysis of the waters of the Aveiron by Caucanas, (1802), AJ/16/6697, AN. “on trouve quelquefois un peu de prévention, maladie de l'esprit humain dont il est d'autant plus difficile de se guérir qu'on ne se doute même pas qu'on en soit atteint.”

<sup>933</sup> As Becane was a surgeon, he was not allowed to make explicit medical prescription, but it was acceptable for him to list a number of case studies, which is what he did. See: Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

<sup>934</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM.

<sup>935</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

he believed that water was the best possible carrier of healing in the human body, likely hoping to convince his colleagues of the rightness of his approach.<sup>936</sup> In some cases, the analyst could make note of further research that had to be done in or around the waters. Cuel made a note that naturalists should come visit the region in which the waters he just analysed were located, as they might find a lot worth studying.<sup>937</sup>

### *Sharing personal opinions with readers*

The reports were not a fully standardised document. The chemical analysis itself was the most normative part of the report, but once it was included, the rest was up to the discretion of the analyst. Sometimes, those analysts had opinions to share and complaints to make, and they chose to express them in the analysis reports where they would be read at least by the reviewers.

The most common subjects of complaint were the bad dietary and lifestyle habits of patients.<sup>938</sup> These complaints revealed an important shift happening around mineral waters. While institutions such as the *Société* tried and often failed to regulate the market of mineral waters, local physicians and intendants also attempted to enact strict rules. They were unhappy that many patients took to the waters of their own accord, without consulting with a physician, either beforehand or during the cure. This power dynamic and feeling of loss of control – and of revenue, it should be said – was present at the level of the analysts. Two analyses came with very opinionated descriptions of the kind of people who came to the waters, and what this revealed about the many ills of society. The first, written in 1779, described how the people who came to visit Riboulet for its waters had all sorts of “incredible” and “fantastical” stories about their health, and its “supposed alterations”.<sup>939</sup> He then complained that “the water Drinkers make a duty of violating every law of dietetics.”<sup>940</sup> These patients were fooled by anecdotal evidences, and would prefer to listen to their ignorant neighbours rather than the sane word of their physician. “I

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<sup>936</sup> Analysis of the waters of Rochefort by by Grignon, (latest 1775), SRM 91B, dossier 27, ASRM. “cest lui [le principe aqueux] qui approche le plus de la nature de nos humeurs, et qui par cette convenance est la boisson la plus naturelle et la plus salutaire et par consequent la plus propre à se perdre dans la masse de nos liqueurs et à transmetre jusques dans les plus petits vaisseaux les parties medicamenteuses qu'elle tient en dissolution ou dans une extreme division. puisque l'eau seule est si amie de notre nature, et qu'on en reçoit même la plus belle vieillisse lorsqu'heureusement né avec un bon temperament on à toujours vecû dun regime uniforme sans aucun excès et sans connoitre de boissons vineuses, de quelle utilité ne devient elle pas, quand par sa nature mineral elle contient des parties salutaires, et qu'on peut la prendre comme remède.”

<sup>937</sup> Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM.

<sup>938</sup> Bertrand-Lagrésie talked about the mistakes of patients who came to take the waters without consulting a physician. Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

<sup>939</sup> Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM. Parle d'histoires “rocambolesques” et “fantastiques” et des altérations “supposées” de la santé.

<sup>940</sup> Ibid, “il semble que les Buveurs d'eau se font un devoir de violer toutes les loix dietetiques.”

have seen this advice become deadly”,<sup>941</sup> the analyst reminisced. Interestingly, he blamed Hoffmann for his unbounded enthusiasm regarding the effects of mineral waters, which had now spread to the public without caution.

A decade later, another physician took up this kind of argument, and used it to make a wider case about the diseases of modernity. He complained that while the ancients used the waters too little, the modern used them too much, probably because of their lifestyle which was conducive to hypochondriacs and hysterics. France’s men had become soft, bored and exhausted with an over-indulgence in “the fiery passions”, much like the Romans had been in their decadence.<sup>942</sup> Such weak modern men, he stated, would be better off changing their diets and exercising rather than flocking to the springs in hope of a cure-all. Perhaps the man had been through his copy of *Émile ou de l’éducation* a few times. In any case, it is notable to see this kind of Rousseauan rhetoric having made its way into analysis reports.

This type of societal comment appeared in another analysis of about the same time period, in which the analyst celebrated the good morality, character and qualities of the locals at the spring of Saint Nectaire, saying that the vices of the city had not yet reached them. Their disinterested nature was an advantage to anyone visiting the spring and would be hosted by good-natured country folk.<sup>943</sup>

Some analysts, especially when the report was destined for the *Société*, treated it as a general update on the state of a spa. One analyst included a full description of a recent volcanic event in his region.<sup>944</sup> He added that this volcanic activity was probably linked to the presence of hot springs a little further south. While this had nothing to do with the analysis itself, it was something he believed the *Société* ought to hear about as well. A few of the analyses included complaints, either about an intendant or a bad inspector. The report on the waters of Vitry-le-François included a snide comment about the poor scientific rigour of the British, who mislabelled their waters as ‘mineral’ when they contained only traces of them.<sup>945</sup> These inclusions show that the analysts felt a certain level of freedom in the writing of the reports. Though they had to convince the reviewers and other analysts of their competence in chemistry, this expertise did not appear to be lessened by the addition of personal opinions, unrelated notes or even some venting about current issues.

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<sup>941</sup> Ibid, “j’ai été guéri dit un voisin ; donc tu le seras. j’ai vu ce conseil devenir mortel.”

<sup>942</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “la fougue des passions”.

<sup>943</sup> Analysis of the waters of Saint Nectaire by Cuel, (1782), SRM 92B, dossier 43, ASRM.

<sup>944</sup> He heard the rumour that a new volcano had recently emerged from the earth, and went to investigate the matter. To his surprise, the rumours were true, and the remnants of burnt land that he witnessed could not have been the result of a forest fire, according to him, and therefore proof of an inflammable spirit “hidden in the Hills”. Analysis of the waters of Vallery by Linacier, (1777), SRM 93A, dossier 16, ASRM.

<sup>945</sup> Analysis of the waters of Vitry le François by Grosse, (1738), SRM 93B, dossier 29, ASRM.

### *The rare inclusion of religious themes*

Something that was mentioned much more rarely, which I believe warrants pointing out, was religion. In all ninety-three analysis reports in my possession, only four made explicit religious comments. In chronological order, Bollioud stated in his introduction that nature was sterile by itself, and that only the Creator could give it life.<sup>946</sup> Méglin thanked the grace of the “author of nature” for placing mineral waters in so many regions of the world.<sup>947</sup> Lastly, Hoffmann in his analysis of the waters of the Bas Selter dedicated his final sentence to thanking the Almighty for gifting such a beautiful remedy to humanity.<sup>948</sup> These three allusions all resembled each other, and were a nod to faith rather than a strict theological discussion. The rarity of religious mentions, even subtle ones, would support the idea that waters were considered by those who analysed them as a largely secular product, a remedy of earth, and of nature, but not of heaven.

There was however one more religious mention that I have omitted. As my work attempts to show, the analysis of waters became somewhat of a genre in the eighteenth century. Consistent tropes can be found in analytical works from the very beginning to the very end of the century. Analysts embodied a version of science which was typical of the Enlightenment. But sometimes, these analyses were also reflections of the individuals who wrote them, and clear distinctions could be found between the analytical style of a Hoffmann, the self-importance of a Fourcroy, or the controversial tone of a Venel. Some authors showed a lot more individuality than others, and this was undoubtedly the case for the strangest analysis in my entire corpus.

Made in 1756, the analysis of the waters of Bugey was made by an anonymous author and sent to the Academy of Lyon. This report was not shy about the religious theme, as it discussed the divine in lengthy and unusual ways. The introduction began with a long description of the region which surrounded the spring of Bugey, called Ambérieu. He compared its landscape to Greece in its idyllic nature. The author claimed that, in this region, one could enjoy the charms of a life devoid of passions. The benefits of this desirable life were exemplified by the charming modesty of the women of Ambérieu: “Those who have once enjoyed their presence; would wish to always see them, such is the effect of the ambrosia one drinks through the eyes.”<sup>949</sup> These “illustrious citizens” were admirable for a never-ending list of qualities.<sup>950</sup> Among others,

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<sup>946</sup> Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL.

<sup>947</sup> Méglin, “Analyse des eaux minérales de Sultzmatz en Haute Alsace.”, 90. “L’auteur de la nature”.

<sup>948</sup> Friedrich Hoffmann, “Analyse parfaite des eaux de la fontaine du Bas Selter, traduit de l’allemand en françois par Pierre-Théodore Leveling,” (A Nancy, Imprimerie de la veuve Cusson, 1791), 38.

<sup>949</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL. “Ceux qui ont une fois joui de leur presence; voudroit toujours les voir tel est l’efet de l’ambrosie que lon boit par les yeux”.

<sup>950</sup> Ibid, “illustres citoyennes”.

they were pious, charming, agile, beautiful and took good care of the poor. This beauty was, according to the analyst, the reflection of divinity itself, and those who could see the faces of the women of Ambérieu would no longer need to read the texts of philosophy in order to understand the divine. This is only a short sample of the long lines of compliments that sung the praises of the women of Ambérieu. The link to the analysis was tangential at best. But the author eventually circled back to the waters, as he described how “at the summit of a steep mountain; the sovereign master of the universe has made a fountain gush;”.<sup>951</sup> He then talked about the miraculous cures operated by the spring, especially at the hands of the gifted monk who distributed them. The analyst heavily implied that this monk was aided by providence itself, although he claimed that it was not the role of “a mortal of my sort”<sup>952</sup> to explain such things as miracles. This lengthy and eccentric introduction was then casually brought back to reality with a final paragraph stating:

I abandon here theological reflexions: I leave the ministry of geographer and historian that I seem to have embraced, a few moments ago, to dedicate myself to that of physicist, which is to say to [the ministry] of a medium and tireless observer of all the beauties of nature. Let us go down to submit our object to a few chemical operations.<sup>953</sup>

Following this whimsical prose, the back half of the text consisted of a much more conventional chemical analysis. This example is by no means representative of the eighteenth-century analytical report. But this outlier also represents a factor that should not be forgotten, being that, although increasingly standard, the reports remained individual texts, and no categorisation could be drawn that would encompass every possible approach to chemical analysis.

## Using reports as a platform to discuss chemistry

During the eighteenth century, there were limited numbers of places in which one could discuss chemistry. The field was dispersed, and not tied to a single institution. The analysis reports therefore provided a kind of platform, a text in which analysts could share their views, discoveries and theories regarding matters of chemistry, something that they could not necessarily do elsewhere.

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<sup>951</sup> Ibid, “dans le Climat heureux dont je ne fais icy que croquer le tableau, climat que l'on pourroit sans hiperbole, comparer a la terre de promission; au sommet d'une montagne escarpée; le souverain maître de l'univers a fait jaillir une fontaine, qui ne seroit jadis qu'a desalterer quelques animaux ferores et qui cependant etoit dotée de toutes les proprietes de la [il-lisible] dont il est parlé dans les pages saintes.”

<sup>952</sup> Ibid, “ce n'est pas a un mortel de ma sorte a se plaindre d'un tel forfait.”

<sup>953</sup> Ibid, “J'abandonne donc les reflexions théologiques : j'abandonne le ministere de geographe et d'historien que je semblois avoir embrassé, il y a quelques momens, pour me livrer a celui de phisicien cest a celui de medium observateur infatigable de toutes les beautes de la nature. Descendons pour remplir notre objet a quelques operations chimiques.”

Occasionally, the analysts would open their introductions with lyrical passages, singing the praises of chemistry. None did this with more eloquence than Gavinet who opened his analysis with the following passage:

Chemistry has the advantage on other arts of being established only on Experience: it is the key to nature, it develops its numb seeds and exposes its secrets, if it presents us sometimes with rather painful pathways, other times it leads us through flower-laden paths, where everything flatters and everything satisfies.<sup>954</sup>

The many analyses of the waters of Passy were used by different authors as a way to voice findings and opinions. Marguery's included reflections on the importance of copper in chemistry for example. He explained that "Chemistry forms excellent remedies from copper", and that it should not be feared by the public who often believed it to be poisonous.<sup>955</sup> During his report on Passy, the analyst Cadet stumbled upon a potential new way to synthesise a beautiful and highly pigmented blue colour, better even than the commonly used Prussian blue. He said in the analysis that the discovery could be of use for the dyes industry, and that he was considering writing a separate memoir on the subject. He did in fact write that paper, which was included in later editions on the Passy analysis.<sup>956</sup> Around the same time, Machy who was also analysing the Passy waters, used them as a vehicle to discuss the value of heat in analysis.<sup>957</sup>

The numerous analyses of Passy also sparked some disagreement, and some analysts used the platform of their reports to vent about previous errors made by their peers. Venel, unsurprisingly, was one of them. "The diverse Medicinal Waters that have been thought as vitriolic are not so; this quality has been attributed to them by Physicians to whom the operations & subjects of Chemistry are absolutely foreign."<sup>958</sup> Venel was undoubtedly of the opinion that chemistry was to be made by competent chemists, and his analysis was a way to give this opinion a wider audience.

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<sup>954</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. "La Chimie a l'avantage sur les autres arts de n'être établie que sur l'Experience : elle est la clef de la nature, elle en developpe les germes engourdis et en décele les secrets, si elle nous presente quelque fois des routes bien penibles, d'autre fois elle nous conduis par des sentiers parsemés de fleurs, ou tout flatte et tout satisfait."

<sup>955</sup> Marguery, "Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.", 93. "la Chymie fait former d'excellens remedes du cuivre".

<sup>956</sup> The memoir on Prussian blue could be found right after the analysis, in: Cadet, "Analyses chimiques des nouvelles eaux minérales de Passy.", 84.

<sup>957</sup> Machy, "Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.", 5. "dérange jamais l'économie de la nature".

<sup>958</sup> Venel and Bayen, "Analyses chimiques des nouvelles eaux minérales de Passy.", 19. "Les diverses Eaux Médicinales qu'on a données pour vitrioliques ne le sont point; cette qualité leur a été attribuée par des Médecins à qui les opérations & les sujets Chimiques étoient absolument étrangers."

Venel was not alone in this. Opinions on chemistry were often formulated by the means of a complaint. Laprade discussed the “chimera of the ocre Vaporans”, a theory that he believed defunct.<sup>959</sup> Chifoliau talked about the common mistake that led certain chemists to believe that iron was present in waters, when they were in fact often mistaking it for selenite.<sup>960</sup> In a similar tone, Thouvenel complained about the exaggerated claims of “ancient chemistry” which wrongly assumed the existence of oily substances in mineral waters.<sup>961</sup>

The space was also used to share interesting observations that related to analysis but were not part of its main components. One analyst for example noted that the bubbling at the spring was more pronounced during storms. The effect of storms on mineral waters were too niche of an observation to ever be part of the main body of the analysis, which is why analysts formulated these kinds of observations in introduction, or conclusion, as a detail that could be of note to the *Société*.<sup>962</sup> Another analyst mentioned the idea that might seem odd, or “*romanesque*” as he put it, of the possible presence of “saline embryos” in the water.<sup>963</sup> The analyst of the waters of Bourbonne shared theories on the chemical nature of smells. He then applied this theory to the waters, and explained how he believed the waters were “armed with active & animated corpuscles” which rendered them capable of entering solids, such as the body, and delivering their remedial effects, much like the invisible particles which conveyed smell were able to enter the sensory organs.<sup>964</sup>

The reports were a space to experiment with ideas, theories, or critique of other methods. The chemistry present in the reports was not solely related to the subject of analysis, but the authors used the medium in order to discuss wider ideas of the field.

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<sup>959</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL. “chimère de l’ocra Vaporans”.

<sup>960</sup> Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>961</sup> Thouvenel, “Mémoire chymique et médicinal sur les principes et les vertus des eaux minérales de Contrexeville en Lorraine.”, 25. “prétentions de l’ancienne chimie”.

<sup>962</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL.

<sup>963</sup> Analysis of the waters of Saint Galmier by Laprade, (1774), Ms 120, f282–283, AAL. “embryons salins”.

<sup>964</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, 38. “Maintenant si l’on veut repasser sur toutes ces productions particulières on reconnoitra sans doute que ces Eaux sont pourvuës & comme armées de corpuscules actifs & animés jusqu’au point de les rendre propres à pénétrer avec facilité dans l’intérieur des corps mêmes les plus solides, lorsqu’ils se trouvent exposés à en recevoir les actions.”

## Coalescing on a combination of medical and chemical approaches

Upon reading a large quantity of reports on chemical analysis, one important principle stands out as being shared by a majority of analysts. Despite the emphasis made on chemistry, the relationship between the expertise of medicine and that of chemistry was not conflictual, it was rather complementary, a sentiment that most of the “physician-chemists” who made these analyses often brought up.<sup>965</sup> This pragmatic combining of two fields on mineral waters had been present for some time by the late eighteenth century. Bycroft in his study on seventeenth and early eighteenth-century applications of iatrochemistry to waters comes to this exact conclusion, stating: “The practice of evaluating mineral waters by studying their composition did not fall between the two stools of chemistry and medicine. Instead, it was a crucial consideration for many students of mineral waters in France in the seventeenth and eighteenth centuries.”<sup>966</sup>

Physicians knew that they needed chemistry to perform a sound analysis, and chemists did not claim to be able to detect the intricate links between a water’s composition and its physiological effects through their expertise alone. There were no claims that analysis somehow rendered obsolete the power of medical diagnosis. Rather, analysts claimed that increased precision on the composition of waters would lead to more accurate medical claims.

A common view among the medical community in the eighteenth-century was that chemistry was terribly useful, but only insofar as it helped physicians in their practice.<sup>967</sup> The physician and analyst Thouvenel echoed that sentiment and said that “Chymistry can only provide on [the applications of mineral waters] inductions that observation alone must confirm. It is to this master of the Arts & the Sciences that it is reserved to put the seal of truth & utility to all speculative knowledge of Medicine”.<sup>968</sup> He stressed a commonly held

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<sup>965</sup> The discourse on the relative positions and prerogatives of chemistry and medicine was included almost only in printed works, which had the space to include such discussions.

<sup>966</sup> Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.”, 26.

<sup>967</sup> Josette Fournier, “Chimie et chimistes dans le Journal de Médecine, Chirurgie, Pharmacie, & c, de 1754 à 1791,” *Revue d’histoire de la pharmacie* 94, n°350 (2006)., 214. “MM. Venel, Leroy, Estève & Broussounet ont eu chacun douze points chymiques à discuter [...]. Dans l’idée de ces sçavans, la chymie n’est donc digne de l’attention du médecin, qu’autant qu’elle lui fournit plus de moyens d’être utile au genre humain ; et nous serons bien fâchés de nous écarter d’une idée aussi sage & vraie.”

<sup>968</sup> Thouvenel, “Mémoire chymique et médicinal sur les principes et les vertus des eaux minérales de Contrexeville en Lorraine.”, 125. “La Chymie ne peut fournir sur cela [les applications des eaux minérales] que des inductions que l’observation seule doit constater. C’est à cette maîtresse des Arts & des Sciences qu’il est réservé de mettre le sceau de la vérité & de l’utilité à toutes les connoissances spéculatives de la Médecine.”

belief, being that both medicine and chemistry could be led into error, and had to be kept in check by “observation”, or experience.<sup>969</sup>

Other analysts were less cautious in their optimism towards the capacities of chemistry. The physician Andrew Cantwell was a good example of this. He graduated from the faculty of medicine of Montpellier and became a professor in surgery. Despite this medical background, when stumbling upon the controversy surrounding the nature of the mineral waters of Passy, he decided to give chemistry a try, regretting that “the practice of Medicine has always stopped me from dedicating myself [...] to this part of the art of healing.”<sup>970</sup> This example shows the interest in chemistry that physicians had, particularly those coming from Montpellier.

In another example of enthusiasm, Gavinet claimed that chemistry could present either a difficult path, or a marvellous walk, rich with flowers and bliss. He also believed that the hardships of chemistry were worth enduring for the benefits that medicine could ultimately gain from it.

The observations on mineral Waters have seemed too long, and too detailed for some chemists; they lead us however to important truths because they reveal useful remedies; besides, the analysis that we can make of them is a pleasant road to tread<sup>971</sup>

Gavinet’s opinion, that chemistry was a promising route to those who wanted to discover new remedies, shows his perspective on the shared authority between medicine and chemistry. Other analysts shared their own reflections on the collaboration between the two fields. Venel discussed these dynamics in some detail. The final line of the book affirmed: “it is up to observations to confirm & extend all the uses [of mineral waters]; [...] the Chemist has fulfilled his task on a new remedy [...] when he has revealed its composition to the Practitioners.”<sup>972</sup> This is not most intuitive way to phrase the sentiment,

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<sup>969</sup> This middle of the road approach was continued throughout his analysis, which he opened with a paragraph rhetorically asking which approach, either medical or clinical, was better for understanding mineral waters. He answered that nothing could surpass the reunion of both. Chemistry, if it relied on “analogy & practical observation”, could be equally valuable. See: *Ibid*, “l’analogie & de l’observation pratique”.

<sup>970</sup> Cantwell, “Analyse des nouvelles eaux de Passy.” “A ce motif s’est joint celui de la curiosité & le désir de sçavoir par moi même, en attendant que quelqu’un plus versé dans la Chymie, à laquelle la pratique de la Médecine m’a toujours empêché de me livrer autant que j’aurois voulu, ait donné plus de jour à cette partie de l’art de guérir.”, 1–2.

<sup>971</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “Les observations sur les Eaux minerales ont parues trop longues, et trop détaillées pour quelques chimistes ; elles nous conduisent cependant a d’importantes verités puisqu’elles dévoilent des remedes utiles ; d’ailleurs l’analyse qu’on en peut faire en une agréable route a parcourir : on y marche a pas assurés ; elle laisse peu a decouvrir a ceux qui dans la fuite veulent toutes de nouvelles experiences.”

<sup>972</sup> Venel and Bayen, “Analyses chimiques des nouvelles eaux minérales de Passy.”, 49. “Au reste, c’est aux observations à confirmer & à étendre tous ces usages ; à la rigueur le Chimiste

but Venel's point was that the job of a chemist was to extend the knowledge of medicine by giving accurate compositions of potential remedies, but it was then the job of physicians to put this information to good use.

The analyst of the waters of Bourbonne explained that in his view, the "clinical" and the "chemical" knowledge about waters had to be given equal weight in the task of prescription.<sup>973</sup> Fourcy's analysis echoed these words, by also stating that what chemistry discovered had to then be enlightened by medicine.<sup>974</sup>

The only manuscript to discuss this question, came from the hand of the doctor Bo, who in 1779, wrote perhaps the best summary of all previous attitudes.

Chemists and clinical physicians each have their way of recognising and determining the virtues of mineral Waters: and it has long been put into question; Which method was the best between analysis and observation. The detail of the reasons which have been given one way or the other to discuss and establish this preference, has made apparent to the greatest number of physicians that it is only by reuniting the most exact chemical research with well-identified practical observations; that one will succeed in establishing rules on the use of mineral Waters.<sup>975</sup>

Analysts appear united in the belief that medicine and chemistry could and should collaborate in the endeavour of uncovering the secrets of mineral waters. This lack of conflict could be argued to be self-evident, as most analysts were specialised in both fields. But a double qualification would theoretically not stop physicians from trying to claim the methods of chemistry as their own, and place the entirety of water science under the umbrella of medicine alone. This was however not the case. Mineral waters were not the object on which a scientific controversy between the two fields unfolded. Rather, the waters provided a fertile terrain for collaboration.

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a rempli sa tache sur un remède nouveau dont on se propose d'enrichir la matière médicale, lorsqu'il en a révélé la composition aux Practiciens."

<sup>973</sup> Chevalier, "Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques.", 10. "C'est donc de la nature & des différens principes des eaux minérales & thermales, que doit dépendre leur choix pour le traitement des différentes maladies. C'est aussi autant de leur connoissance clinique que chymique, que doit dépendre la maniere de prononcer pour ou contre."

<sup>974</sup> Fourcy, "Analyse des eaux alkalino-martiales de Trye-le-Chateau avec l'exposition de leurs propriétés faite par M. Fourcy, Faite sous les yeux de M. Raulin.", 31.

<sup>975</sup> Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM. "Les chimistes et les medecins cliniques ont chacun leur maniere de reconnoitre et de determiner les vertus des Eaux minérales : et l'on a longtems mis en proposition ; La quelle methode etoit la meilleure de l'analyse ou de l'observation. Le detail des raisons qu'on a données de part et d'autre pour discuter et etablir cette préférence, a fait sentir au plus grand nombre de medecin que ce n'est qu'en reunissant les recherches chymiques les plus exactes aux observations pratiques bien constatées ; qu'on parviendra à etablir des regles certaines sur lemploi des Eaux minérales."

## Conclusion

By focusing on the analysts of mineral waters, this chapter endeavours to take a different approach from the prior focus on institutional and market forces. But rather than painting an entirely different picture, the point of view of the analysts simply presents a different vantage point, one that still includes the strong presence of institutions, and the essential role of the market, but from the perspective of a different social group with a unique set of interests.

The chapter starts by giving a general account of who those analysts were. Using a database surveying ninety-three different chemical analyses made during the eighteenth-century, I was able to show that the analysts were men who almost all shared a medical background. Most were physicians, but apothecaries, and in rarer cases surgeons, were also represented. All of them exhibited skills in chemistry, though only a handful referred to their work as that of a chemist.

Chemical analysis was a difficult and sometimes expensive undertaking. This chapter therefore examines the reasons stated by analysts as motivations for conducting their work. These fell into three main categories. Most often, analysts highlighted their desire to augment the collective knowledge on mineral waters, or to highlight an understudied water with promising characteristics. The second common motivation was economic in nature, as analysts did these chemical experiments as a way to bring attention to a particular water or to repair its damaged reputation. Finally, analyses were also performed either out of duty to the medical profession, or as a required part of an application in order to obtain a position in the mineral water market, such as inspector or intendant.

This enquiry into the analytical reports clearly shows that analysis was rarely an isolated endeavour. Though the majority of analysts only authored one report, they often received help. Many analysts credited the people who sourced information, sent them bottles, witnessed the experiments or assisted them in interpreting a puzzling observation. In addition, the analysts cited other *savants* in their reports. Some frequently cited names were Hoffman, Venel, and Bergman, but many more were credited or criticised for their contributions to mineral water science.

Based on these findings, I argue that mineral water analysts constituted a network, an esoteric circle,<sup>976</sup> and one that they were aware of themselves. Though they differed in social status and in education, they shared the sense of belonging to a wider group of other analysts who all employed comparable methods, and shared a language which was in part unique to them. Given the isolation of the medical profession, particularly in the countryside away from Academies and Faculties, this network presented eighteenth-century physicians with a rare opportunity for scientific exchange.

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<sup>976</sup> Fleck, *Genèse et développement d'un fait scientifique*.

This brings an interesting dimension to the social position of analysts as a group. They were medical men, but they were also chemists, at a time that chemistry did not yet constitute a profession in its own right. The reports voiced opinions and new theories, creating a space for the discussion of chemistry. This depicts an unconventional image of eighteenth-century chemistry, one that shows the characteristics of this emerging science from a different perspective and does not solely focus on the more traditional centres of the field, like the Parisian scientific scene or the European network of Academies.

Finally, this chapter brings a new outlook on the place of controversy in chemistry. Though the relationships between analysts were dotted with small conflicts, disagreements, and a desire to right the wrongs of previous analyses, the method itself generally achieved consensus. The motivations were similar, and most analysts agreed on the effectiveness of the collaboration between medicine and chemistry. Knowledge on mineral waters was not built through the rivalry of two fields, but rather by a largely functional division of tasks.

## Chapter 7. Sensory analysis

Following an exploration of the social world of the analysts, I will now turn to the work they conducted. The process of enlightening waters was in many ways guided by a scientific ideal, a hope that careful and rational experimentation would lead to reliable knowledge about mineral waters, which in turn could inform their consumption. Chemical analysis was the primary method through which scientific knowledge on mineral waters was constructed in the eighteenth century. But this analysis was no straightforward undertaking. It involved several different steps, the very first of which being sensory analysis. Somewhat unexpectedly, this section of the analysis turned out so rich and so revealing regarding the waters themselves and eighteenth-century science at large, that I must dedicate an entire chapter to its intricacies.

The concept of sensory analysis itself is not complicated to grasp intuitively. The analyst would smell, taste and feel the water, and make claims based on this sensory experience. Much like a cook can tell when a dish contains salt or cloves, an analyst could also feel the difference between a sulphurous or an iron-rich water. Using their senses cost the analysts nothing, so they had no reason to deprive themselves of this information.

This simple description of sensory analysis hides a world of complexities. The first relates to the fact that sensory expressions are more difficult to retrieve from written material than ideas and opinions. A special methodology is therefore required in order to discuss the senses historically. The second complexity resides in understanding the process used in order to make these descriptions. Was sensory analysis, when viewed alongside distillations and chemical reagents, meaningful in the results of the final report? Was it even considered a scientific practice, or did analysts view it as too subjective to be genuinely useful? These questions can be answered, but they require special inquiry.

In addition, this chapter poses a particular historiographical challenge. Eighteenth-century mineral waters hold a relatively small place in the secondary literature.<sup>977</sup> But the question of the senses is a point of interest in Enlightenment scholarship. The sensory and its importance to the time period has been studied for several decades. Despite this, research in the history of science and the history of chemistry have suggested that sensory analysis was a relatively unscientific aspect of the field, one which lost credibility towards

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<sup>977</sup> See chapter 1, Section two.

the end of the century. Because of this established narrative which I believe to be erroneous, I will use this chapter in order to present a case against this argument.

In order to uncover the place of sensory analysis in the knowledge on mineral waters, I will once again call to quantitative methods. I have compiled all sensory descriptions from the ninety-three analytical reports used in the database. Each time that an analyst gave an account of the appearance, taste, smell or texture of a mineral water, I noted the quote and subsequently extracted the sensory vocabulary. These vocabulary lists, which are available in full in the thesis' appendices, will form the empirical base of the argument that I will be presenting here.<sup>978</sup>

I will begin this chapter by discussing the complex problem of defining mineral waters. Though the waters as a historical object have been defined in introduction, a brief study of eighteenth-century definitions showcases the place of the sensory in lay descriptions of mineral waters. I will then outline the historiographical debate regarding the sensory in history, and present the tenets of the argument that I will be attempting to disprove. The rest of the chapter will be dedicated to a careful study of the vocabulary of the sensory, separating each sense in its own section. In succession, I will consider the vocabulary used to refer to sight, taste, smell and texture. I will conclude with a review of my central claim, which is that sensory analysis was, against established narratives, a useful and crucial step in chemical analysis.

## The arduous task of definition

Early modern mineral waters lacked a clear and inclusive definition. So far, they have been described as a special blend of natural products, held in an aqueous solution, which in turn had some desirable effect on the body.<sup>979</sup> That definition suffices for the purposes of studying waters as the object of commerce or institutional control. In a sense, to early eighteenth-century regulators, it hardly mattered which exact cocktail gave the waters of Spa their fame. Once they were established as powerful and stable remedies, there was power and inertia in that name, one that did not need the constant probing of chemists to thrive. Most waters though did not have this kind of instant recognition. And in order to sort the good from the bad waters, a better definition was needed.

Despite this need, early modern mineral waters tended to escape straightforward boundaries. This is hardly remarkable in itself, many objects of study

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<sup>978</sup> See Appendix n°[3] on the full list of vocabulary used in sensory analysis.

<sup>979</sup> This was for example the definition of mineral waters given in Diderot's *Encyclopédie*, cited in Chapter 1. Diderot, Rond, and Jaucourt, "Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.", Volume X, Article "Minérales Eaux, (Chimie & Médecine)", 534.

remain blurry on the edges, no matter how close one happens to be looking. In the case of waters, the perpetual blur came the product itself. A water that contained minerals counter-intuitively did not automatically qualify as a mineral water. As Enlightenment chemists understood and as is still held true to this day, no water is ever perfectly pure, least of all the water taken from natural sources. Every water is ‘mineral’ in a small way.

The term ‘mineral’ seems like it could help in the endeavour of definition. But unfortunately, if it did technically have a chemical definition in the eighteenth century, the word ‘mineral’ was consecrated by habit rather than science. Many waters which contained few actual minerals, such as naturally gaseous waters, still belonged to the elusive category of mineral waters. To further complicate things, higher concentrations of minerals could only rarely be correlated with stronger therapeutic effects. If it had been the case, it might have been relatively easy to establish a minimum threshold of concentration for a water to qualify as mineral. Any water containing, say, less than a grain per pint of minerals, would not make the cut. In fairness, this argument of quantity was used to sell highly concentrated waters. The opposite discourse however, claiming that small amounts of minerals were gentler on the body, and better suited the delicate balancing act of restoring health, was also in vogue.<sup>980</sup> This dual rhetoric complicated efforts of formalisation.

The history of mineral water usage has been strewn with attempts at classifying them in categories matching their properties.<sup>981</sup> Most ancient classifications only attempted to distinguish good potable waters from corrupted ones. Citing Galen, most physicians adhered to the idea that good waters were transparent, without smell or taste, and fast flowing.<sup>982</sup> A lack of recognisable characteristics, such as a “salty” or “atramentary” taste was seen as a sign that the water contained no external substances, and was therefore likely safe to

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<sup>980</sup> The physician Carrère introduced his general treatise on mineral waters with a reflection on the efficiency of mineral waters in medicine. He credited their efficacy to their great dilution. Water, he argued, was the best carrier of substances to the human body, and large quantities of waters were needed in order to bring the precious minerals to the ends of the body. This was an opinion shared by many other physicians. See: Carrère, “Catalogue raisonné des ouvrages qui ont été publiés sur les eaux minérales en général et sur celles de la France en particulier, avec une notice de toutes les eaux minérales de ce royaume.”, 1. “On a reconnu depuis longtemps l’utilité des Eaux Minérales dans la pratique de la médecine. La variété de leurs principes peut les rendre efficaces dans une infinité de cas où les ressources de l’art sont très-bornées & insuffisantes. Le véhicule doux & abondant, dans lequel ces principes sont comme noyés, facilite leur introduction dans nos vaisseaux, & leur mélange avec la masse de nos fluides : il augmente ainsi leur efficacité.”

<sup>981</sup> Patrick Galliou, “Water, Water Everywhere... Water, Ailing Bodies and the Gods in Roman Gaul and Britain,” in *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*, ed. Annick Cossic and Patrick Galliou (Newcastle: Cambridge Scholar Press, 2006), 3–13.

<sup>982</sup> This classification can be found late in the early modern period, for descriptions of potable waters, such as rivers, wells, and regular fountains. See an example in: Analysis of the waters of Rainsy by de Horne, (between 1779 and 1787), SRM 91B, dossier 20, ASRM.

drink.<sup>983</sup> Another simple division which had been widely used since antiquity separated waters meant for drinking from waters meant for bathing, based on temperature.<sup>984</sup>

These simple divisions became insufficient in the early modern period, especially as both cold and hot waters started to be transported in bottles. Besides, the potability of mineral waters was rarely put into question. They were all safe to drink, as a prerequisite of being a remedy. Preference was thus given to systems that took into account the chemical makeup of a water, or at least its most prominent principle, as the base for classification. The springs could be classed as ferruginous, sulphurous, acidic, selenitic, and more.

The first downside of such classifications was the difficulty in being exhaustive. There could always be a new type of water which would not fit the previous categories. This system was also not well suited to waters which contained several principles, and therefore belonged to different categories at once. Additionally, this system was hardly intuitive for the majority of mineral water users whom, by and large, were not trained in chemistry and were not necessarily able to appreciate the differences between sulphurous and bituminous principles.

In media that was not made for the attention of chemists, mineral waters were often defined by using examples. Sixty years apart, the two definitions of the Académie Française dictionary varied very little. In 1694, a mineral water was defined as having “contracted some virtues which serves as remedy”, stating as examples the waters of Forges, Spa, Bourbon, Saint Myon and Sainte Reine.<sup>985</sup> In 1762, the habit of using mineral waters for both bathing and drinking was included in the passage about virtues, and the Passy spring was added to the list of examples.<sup>986</sup> Both of these definitions however, made

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<sup>983</sup> Claude Nicolas Le Cat, “Traité des Sens,” (A Paris, chez Guillaume Cavelier, 1744), 22. This view endured well into the nineteenth century, see: “Dictionnaire des sciences médicales, par une Société de médecins et de chirurgiens,” (à Paris, chez Charles-Louis-Fleury Panckoucke, 1814), 460–461. “L'eau est en général potable, lorsqu'elle n'a pas d'odeur, et que sa saveur n'est ni désagréable, ni fade, ni piquante, ni salée, ni atramentaire.”

<sup>984</sup> “Eaux minerales”, F. Delaulne, H Foucault, and M. Clousier, in *Dictionnaire universel françois et latin contenant la signification et la définition tant des mots de l'une et l'autre langue, avec leurs différents usages, que des termes propres de chaque état et de chaque profession* (Imprimé à Trevoux et se vend à Paris, 1721), 15.

<sup>985</sup> “Eau”, in *Le dictionnaire de l'Académie françoise* (A Paris, Vve J. B. Coignard et J. B. Coignard, 1694), 356. “Eau, se dit aussi de certaines eaux qui en passant au travers des minéraux, contractent quelque vertu qui sert de remede. Eau Minerale. eau de Forges, de Spa, de Bourbon, de saint Mion, de sainte Reine. eaux vitriolées, alumineuses, &c. aller aux eaux. prendre des eaux. il prend tous les matins deux bouteilles d'eau d'un tel endroit. les eaux ne luy sont pas bonnes. il ne rend point ses eaux.”

<sup>986</sup> “Eau”, in *Dictionnaire de l'Académie françoise* (Chez la Veuve de Bernard Brunet, Imprimeur de l'Académie Françoise, Grand'Salle du Palais, & rue basse des Ursins, 1762), 572. “EAU se dit aussi de certaines eaux, qui en passant au travers des minéraux, contractent quelque vertu médicinale, soit qu'on s'y baigne, soit qu'on les boive. Eau minérale. Eau de Forges, de Spa, de Bourbon, de Bourbonne, de Passy, de sainte Reine. Eaux vitrioliques, alumineuses, &c. Aller aux eaux. Prendre les eaux. Il prend tous les matins deux bouteilles d'eau d'un tel endroit. Les eaux ne lui seront pas bonnes. Il ne rend point ses eaux. Les eaux ne passent point.”

use of the classification based on chemical principles. Other mainstream dictionaries included even more chemical vocabulary in their definition of mineral waters. The popular *Dictionnaire de Trévoux* described the chemical diversity of mineral waters: "There are some that are actually cold, & which have a more or less sour taste; they are called *acidulous*: they are most often charged with particles of iron, vitriol, nitre, or alum."<sup>987</sup>

When analysts attempted to define mineral waters, they combined various types of classifications. A 1718 analyst described them as waters that had encountered an underground "mineral matrix" which charged them in particles, without compromising their transparency. He added "some are vitriolic, martial, nitrous, saline, mercurial & they all have a taste relative to the mineral by which they are impregnated".<sup>988</sup> This definition allied different genres. His definition was geological, but also chemical and sensory. In the following lines, he pondered over the mystery of their composition. This mystery was a leading reason as to the complexities around their definition.<sup>989</sup> The impulse to define a water through multiple means of classification was often posed against potential doubts around their status as remedies. If a water had a strong smell, a recognisably mineral taste, distinctive medical properties, as well as an unusual temperature, its status as a proper mineral water was harder to deny than a water which had nothing but a small residue to attest of its mineral nature.<sup>990</sup>

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<sup>987</sup> "Eaux minérales", "Dictionnaire universel françois et latin contenant la signification et la définition tant des mots de l'une et l'autre langue, avec leurs différents usages, que des termes propres de chaque état et de chaque profession, communément appelé Dictionnaire de Trévoux," (Nancy, de l'imprimerie de Pierre Antoine, 1740), 1003. "Eaux Minérales, aque minerales, sont des eaux qui ont contracté quelque vertu en passant à travers des minéraux, comme sont l'alun, le vitriol, le soufre, &c. Il y en a qui sont actuellement froides, & qui ont un goût plus ou moins aigre ; on les appelle acidules : elles sont le plus souvent chargées de particules de fer, de vitriol, de nitre, ou d'alun. Il y en a d'autres qui sont actuellement chaudes, & qu'on appelle thermales : celles ci sont ou salées, ou nitreuses, ou bitumineuses, ou sulfureuses, ou ferrugineuses. Les eaux minérales sont aussi ou naturelles, ou artificielles. Les naturelles sont l'ouvrage de la nature : les artificielles dépendent de l'industrie des hommes. Les eaux de Bourbon, de Forges, de Spa, de Pougues, de Passy près Paris. On dit absolument, il est allé aux eaux. On lui a ordonné les eaux. Voyez Mineral."

<sup>988</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. "on nomme source minerale une eau qui rencontrant dans le sein de la Terre une matrice minerale se charge de ses parties les plus solubles sans perdre sa transparence, il y en a de vitrioliques, de martiales, de nitreuses, de salines, de mercurielles & elles ont un gout relatif au mineral dont elles sont impregnées".

<sup>989</sup> Esquirou mentioned a theory which stated that a universal solvent existed within the earth, which had the capacity to dissolve metal in waters. He argued against this theory however, stating that if that were the case, all waters, not only mineral waters, would contain dissolved metals. He added that supposing substances that were not needed to explain reality was "odious to philosophers". Ibid, "la multiplicité des etres sans necessité passe pour odieuse chez les philosophes."

<sup>990</sup> See this dynamic in: Analysis of the waters of Vitry le François by Grosse, (1738), SRM 93B, dossier 29, ASRM. "Maintenant, si une Eau contient naturellement ces différents minéraux, peut on encore douter, que cette Eau elle même soit minerale ? Pour moy, je n'hésite pas un moment de la regarder comme une très-bonne Eau-minerale, et du nombre de celles, que les

Attempting to define mineral waters was often done in the introductions of analyses, but the difficulty in finding a flexible yet precise definition often meant that analysts went in rhetorical circles. Chevalier stated in his report's introduction: "Mineral & thermal waters are regarded by all chemists & naturalists, as simple or common waters, charged with a certain quantity of mineral matter, that they detach & carry, during their circulation, in the entrails of the earth, to then carry them outside".<sup>991</sup> Basically, according to Chevalier, a mineral water was a water that contained minerals from the earth. This definition barely expanded on what their name already indicated.

Around the same time, a number of chemical manuals offered their own definitions of the elusive waters. The 1771 manual on mineral chemistry by Bucquet described mineral waters as containing "a more or less considerable" quantity of minerals. He added though, that "Physicians regard as pure waters all those that, being only a little charged, have no manifest properties."<sup>992</sup> Like Chevalier's, this definition does not shine by its precision. It did however add a mention of the water's effects, suggesting the existence of waters which contained minerals without having medical properties, and thus not being considered proper mineral waters.

The chemist Macquer struggled with the same issue of being either too broad or too precise in his definition. According to him, the most inclusive definition had to include any water "which found itself naturally charged of some heterogeneous substance that it has dissolved inside the earth".<sup>993</sup> He granted that such a definition technically included almost all waters on earth. He therefore admitted that calling a water 'mineral' had something to do with "usage", as in, habit.<sup>994</sup> This definition therefore conceded that mineral waters were partly culturally defined. Other chemical works danced around the same

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Auteurs ont appellés Acidules : je ne balance pas même, de la comparer aux Eaux de Passy et de Forges". The author used the chemical classification, as well as the common "acidule" denomination, and added a comparison with other well-established waters in order to solidify his claim.

<sup>991</sup> Chevalier, "Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques.", 4. "Les eaux minérales & thermales sont regardées de tous les chymistes & naturalistes, comme des eaux simples ou communes, chargées d'une certaine quantité de matiere minérale, qu'elles détachent & charrient, pendant leur circulation, dans les entrailles de la terre, pour ensuite les porter au dehors".

<sup>992</sup> Jean Baptiste Michel Bucquet, "Introduction à l'étude du règne minéral," (Paris, ed. Jean Th. Hérisant père, 1771), 370. "Les eaux qui se filtrent dans les entrailles de la terre, se chargent d'une quantité plus ou moins considérable des matières qu'elles traversent." "Les Médecins regardent comme des eaux pures toutes celles qui, n'étant que peu chargées, n'ont point de propriétés bien manifestes."

<sup>993</sup> "Eaux minérales", Pierre Joseph Macquer, "Dictionnaire de chimie contenant la théorie et la pratique de cette science, son application à la physique, à l'histoire naturelle," (A Paris, Chez Théophile Barrois, Libraire, Quai des Augustins, n°18, 1778), 364. "EAUX MINÉRALES. En prenant le nom d'eaux minérales dans le sens le plus général & le plus étendu, on devoit le donner à toutes les eaux qui se trouvent chargées naturellement de quelques substances hétérogènes qu'elles ont dissoutes dans l'intérieur de la terre ;".

<sup>994</sup> Ibid.

issue. This is most likely why in 1787, after many failed attempts at a clear and all-encompassing definition, Gastellier defined mineral waters through their sensory qualities, saying “they have been also distinguished and more reasonably, relatively to their sensible qualities, as acidulous, sour, bitter, insipid, sulphurous, soapy, &c.”<sup>995</sup>

Despite attempts at establishing strict boundaries and classifications, the definition of mineral waters with the highest appeal to intuition was based in the senses. A water was mineral, when it felt mineral. Namely, when a water differed enough from regular springs, either through its appearance, taste, smell, or the way it felt, and that anybody would reasonably reach the same conclusion upon experiencing the water themselves, only then could it be considered mineral.

In practice, despite the coexistence of many other kinds of classifications, this is how mineral waters were defined in the majority of the eighteenth century. According to the limited available literature on the subject, one might even be able to extend that assessment to waters in later periods. Agathe Euzen and Jean-Paul Haghe concluded their study of the habits of drinking Seine water by stating “users habitually evaluated and defined ‘good water’ by means of their sensory experiences, and it was only in the 1840s that they were able to base their judgment on the kind of scientific norms elaborated, notably, by pharmacists and chemists.”<sup>996</sup> The present thesis argues that the arrival of chemists and pharmacists on that scene took place much earlier than the mid-nineteenth century cited here, but this only strengthens the argument regarding the importance of the senses. If the sensory experience and chemical analysis were used concomitantly for about a century, it clearly shows that one did not simply replace the other, and the importance of sensory descriptions of waters were not merely a sign of the absence of other more effective techniques.

## The historiography of the ‘Sensory turn’

It can be challenging to escape overwhelming generalities when studying the senses. The ability to derive meaning and information about the world through the medium of senses is so universal that the task of refining the object into something approachable can be complicated. One popular shortcut is to state: “The senses are cultural”, thus making them suitable to the methods of historians. If indeed the senses are context-bound and culturally defined, studying texts describing the senses is pertinent, rather than seeing the sensory as an

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<sup>995</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “on les aussy distinguées et avec plus de raison, relativement à leurs qualités sensibles, en acides, aigrelettes, ameres, insipides, sulfureuses, savoneuses, &c.”

<sup>996</sup> Agathe Euzen and J-P Haghe, “Drinking water from the Seine in the 18<sup>th</sup> century, or the emergence of the filtration fountain” (5<sup>th</sup> IWHA conference, Pasts and Futures of Water, Tampere, Finland, 2006).

all-eternal and unquestioned given. And yet, in that statement, the echo of its opposite can still be heard. If the cultural nature of the senses needs to be stated, there must exist an opposite urge to classify them with nature. To further complicate things, this hesitation itself can also be traced historically. Many philosophers have attempted to draw maps of the senses and of the nature of experience, often contending with the simultaneously immediate and subjective nature of the senses.<sup>997</sup>

A sensory impression feels unmediated by the mind. If something burns, then it is hot, and no logical discussion, no comity of peer review nor act of faith is needed to reach that conclusion. Scents can feel like they imprint directly on the mind, bypassing all cognitive action. At the same time, the senses can be tricked, and change over time. The existence of the concept of ‘acquired taste’ is a clear argument in favour of the cultural nature of the senses. If no child is born liking coffee or wine, what force other than culture can explain their popularity across thousands of years?

It can be surprising, how quickly one has to resort to this kind of thinking when discussing the sensory experience. The purpose in bringing up these opposite sides here, is to give an incline of the questions that many historical actors who gave thought to their own use of the senses had to ask. The senses are both objective and subjective. To some they are useful, to others useless. They are part of the human condition, and yet irredeemably individual. This rather dramatic dichotomy is part of the study of the sensory.

The purpose of my research is not to reinvent this particular debate, and find a definitive place for senses on an axis of subjectivity. Rather, this complexity is in itself an argument as to why historians should be interested in the senses. Since the ‘sensory turn’ of the 1980s, many scholars have reconsidered well-tread paths of historiography with the new lens of sensory experience, to much success.<sup>998</sup> Taste has been used to shed new light on countless classical fields of historiography. India Mandelkern for instance, used the sensory to submit a new angle on historical understandings of national identity.<sup>999</sup> In her

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<sup>997</sup> Danijela Kambaskovic-Sawers and Charles Wolfechapter’s discusses the history of the sensory in science and philosophy. They highlight the role of medicine in enforcing and challenging the strict superiority of sight. “If sight is privileged in the idealist philosophical tradition, as the contemplation at a distance of the objects of perception, touch, the contact sense, the dirty sense, is all the way at the other extreme. This is the case, whether in a libertine sense or in the way early modern “empiricks” or barber-surgeons get their “hands dirty,” whereas learned professors of medicine do not”. See: Danijela Kambaskovic-Sawers and Charles Wolfe, “The Senses in Philosophy and Science: From the Nobility of Sight to the Materialism of Touch, A Cultural History of the Senses in the Renaissance,” in *A Cultural History of the Senses in the Renaissance*, ed. Herman Roodenburg (Bloomsbury, 2014), 108.

<sup>998</sup> David Howes and Marc Lalonde, “The history of sensibilities: of the standard of taste in mid-eighteenth century England and the circulation of smells in post-revolutionary France,” *Dialectical Anthropology* 16, no. 2 (1991).

<sup>999</sup> Her study of the rise of fine food in early modern England, describes “The very idea of a refined and discriminating palate” as seen by some Englishmen as “little more than an insidious French tactic designed to exploit the fluidity of the English caste system.” India Aurora Mandelkern, “The Politics of the Palate: Taste and Knowledge in Early Modern England”

study on taste in early modern England, she explains how appreciating certain foods became more than an individual experience, it was a demonstration of one's weakness and submission to the French. In the same vein, Alain Corbin's work describes the sensitivity to smells as dramatically increasing in the span of the last few decades of the eighteenth century, in correlation with an increased distaste for the lower classes and their bad smell. The elite's increasing consciousness of smells was part of the construction of a degrading discourse targeted at the poor.<sup>1000</sup>

These studies suggest that expressing sensory impressions was not always trivial, and that paying attention to the construction of a sensory description can lead to new historical insights. But the idea behind the sensory turn is I believe best summarised by its pioneers, David Howes and Marc Lalonde, who wrote: "By exposing the organs of taste and smell to the same sort of critical scrutiny as Michel Foucault has lavished on the eye, we may go part of the way toward curing us of the very myopia that landed us 'In the Empire of the Gaze'."<sup>1001</sup>

Sensory turn historiography often revolves around the early modern period, particularly the eighteenth century. The British and French early modern periods in particular have occupied many of the writings of the sensory turn.<sup>1002</sup> This interest can be linked to the period's own interest in defining the senses, especially in philosophy. Enlightenment thinkers often commented on the role of the senses. Kant for example placed smell at the bottom of the hierarchy of useful senses, being too fleeting and unreliable of an experience to be used objectively.<sup>1003</sup> Others expressed enthusiasm towards the senses, as a novel way to experience the world. Diderot's writings on synaesthesia were an example of this propensity.<sup>1004</sup> Jonathan Reinartz even argued that deprecation of the value of the senses took place mostly in the seventeenth century, and that by contrast "This denigration of the senses was partially reversed in the eighteenth century, with many more intellectuals stressing the importance of the senses in the acquisition of knowledge."<sup>1005</sup>

Eighteenth-century philosophical discussions of the sensory cannot be easily connected to the practice of men of science of the same epoch. In order to

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(Dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in History University of California, 2015), 47.

<sup>1000</sup> Alain Corbin, *The Foul and the Fragrant: Odor and the French Social Imagination* (Harvard University Press, 1986).

<sup>1001</sup> Howes and Lalonde, "The history of sensibilities: of the standard of taste in mid-eighteenth century England and the circulation of smells in post-revolutionary France."

<sup>1002</sup> Beatrijs Vanacker, Lieke van Deinsen, and Inger Leemans, eds., *Taste and Smell in the Eighteenth Century* (Hilversum: Verloren, 2017).

<sup>1003</sup> Immanuel Kant, *Anthropology from a Pragmatic Point of View*, ed. Robert B. Loudon and Manfred Kuehn (Cambridge University Press, 2006), 49.

<sup>1004</sup> Vanacker, van Deinsen, and Leemans, *Taste and Smell in the Eighteenth Century*, 7.

<sup>1005</sup> Jonathan Reinartz, *Past Scents : Historical Perspectives on Smell*, ed. Mark M. Smith, *Studies in Sensory History*, (University of Illinois Press, 2014), 13.

study the meaning of the sensory in different parts of the early modern world, many scholars have chosen to focus on the field of medicine.<sup>1006</sup> The medical world was a place of brutal encounter between the world of thought and the material and sensory world, making it a compelling case study. Medicine had long enjoyed a high social status, important symbolic power, and strong institutional footing as one of the original university disciplines. In contrast, its subject of study was evasive, crude, highly sensitive, and of course, sensory. Physicians encountered the senses professionally in two main ways. The first was in the transmission of the patient's experience. Premodern medicine depended highly on the capacity of physicians to decode the sensory descriptions given to them by their patients. The second was the use of their own bodies as instruments, in relation to remedies, and bodily fluids, which had to be smelled and tasted in order to inform diagnosis.

This practice was Galenic, as each humour was associated with a certain taste, and could be detected in its excesses. The difficulties in doing such a thing were already recognised by Galen himself, who mentioned that the black bile in a sick person's vomit could be identified by taste, but that "no fly or other creature would wish to have a taste of it".<sup>1007</sup> But despite the very understandable physical revulsion, and the known difficulty to make systematic diagnostic tools out of taste and smell, such practices endured. According to Mandelkern: "For both experts and laymen, gustatory information informed diagnoses, therapies, and a host of clinical practices."<sup>1008</sup>

A trained palate was an essential part of the practice in other branches of medicine too. Apothecaries had to have sensory knowledge of the remedies they manipulated. This was recently explored by Nils-Otto Ahnfelt, Hjalmar Fors and Karin Wendin in a study which concluded that early modern apothecaries would have been very likely to be able to identify pharmaceuticals through sensory tools. The study also demonstrates that such results could be replicated, and that several people could be in accordance, thus arguing that it might not be satisfactory to relegate taste as simply 'subjective'.<sup>1009</sup> In the pursuit of authenticity in remedies, the senses of an apothecary remained for the entirety of premodern medicine, the most reliable tool available.

But if the senses could be reliably used, transmitting a sensory experience could still present challenges. Susan Lawrence describes the British eighteenth century as a time of optimism regarding the possibility of finding a good

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<sup>1006</sup> Another example can be seen in: Maria Pirogovskaya, "Constructing the Delicate Subject. Eighteenth-Century Russian Medical Books on Strong Flavours and Feeble Fibres," in *Taste and Smell in the Eighteenth Century*, ed. Beatrijs Vanacker, Lieke van Deinsen, and Inger Leemans (Hilversum: Verloren, 2017).

<sup>1007</sup> Galen, *On Black Bile*, cited in: Mandelkern, "The Politics of the Palate: Taste and Knowledge in Early Modern England.", 11.

<sup>1008</sup> *Ibid.*, 39.

<sup>1009</sup> Nils-Otto Ahnfelt, Hjalmar Fors, and Karin Wendin, "Historical Continuity or Different Sensory Worlds? What we Can Learn about the Sensory Characteristics of Early Modern Pharmaceuticals by Taking Them to a Trained Sensory Panel," *Wissenschaftsgesch* 43 (2020).

and “unambiguous” language to translate the sensory experience.<sup>1010</sup> Generally, British physicians expressed the prevailing sentiment that language would be able to bridge the gap between the sensory experiences of two separate individuals, at least sufficiently for the needs of the practice.<sup>1011</sup> Though according to the author, this precise language was not yet available to eighteenth-century practitioners.

Steven Shapin's works on the subject conflates this point. His survey of the vocabulary available to describe taste shows a relative lack of diversity in the lexical field. He describes Galenic sensory vocabulary as being rather narrow. In order to match taste to Galenic qualities, which was a common way to qualify taste in medicine, physicians often used a vocabulary to the tune of: “Leeks are hot and dry. Black pepper is the same but more so.”<sup>1012</sup> If taste was lacking a rich a varied set of descriptors, an attempt to systematically link it to the four qualities would have further limited the possibilities of accurately transmitting it *via* language. If Shapin’s assessment of eighteenth-century taste vocabulary is accurate, it would be at odds with the research suggesting that physicians and apothecaries were able to efficiently communicate their sensory experience and use it in their professions.

This alleged poverty in vocabulary correlates rather well with a large portion of the scholarship on the subject which argues that the end of the eighteenth century and the beginning of the nineteenth were a turning point in the use of senses in science, with the end of the Enlightenment also signing the end of the use of senses as a tool of scientific investigation. Lissa Roberts famously argued that the “death of the sensuous chemist” occurred in the aftermath of the chemical revolution.<sup>1013</sup> This claim built upon her earlier work on the transition of chemistry from art to science. She argued that the relation to the sensory was at the heart of this transition, stating: “These chemists situated their art in the realm of the senses.”<sup>1014</sup> The move towards the realm of science did not however signify a complete break from the sensory, as chemistry was still “grounded in the sensible world”.<sup>1015</sup> The death of the sensuous chemist is described as a rhetorical move away from sensory description in

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<sup>1010</sup> Susan C Lawrence, “Educating the senses: students, teachers and medical rhetoric in eighteenth-century London,” in *Medicine and the five senses*, ed. William F. Bynum and Roy Porter (Cambridge University Press, 1993).

<sup>1011</sup> This sentiment can also seem optimistic when confronted with Lawrence’s assessment of the language available in order to convey sensory experience. She opens her chapter by stating: “Words serve uneasily to reify experience.” *Ibid*, 154.

<sup>1012</sup> Steven Shapin, *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*, vol. 14, *Salvia Småskrifter*, (Uppsala: Tryck Wikströms, for the University of Uppsala, 2011), 9.

<sup>1013</sup> Lissa Roberts, “The death of the sensuous chemist: The ‘new’ chemistry and the transformation of sensuous technology,” *Studies in History and Philosophy of Science* 26, no. 4 (1995).

<sup>1014</sup> Lissa Roberts, “Filling the Space of Possibilities: Eighteenth-Century Chemistry's Transition from Art to Science,” *Science in Context* 6 (1993).

<sup>1015</sup> *Ibid*, 550.

scientific texts. The emphasis on instrumentation and quantitative measures of Lavoisieran chemistry completed the transition of chemistry in the definitive world of science, leaving the sensory behind.

This is the point which Shapin gives credence to with his own study of taste. He describes the process by which chemistry and its claims onto the world of taste in the eighteenth and early nineteenth centuries “shattered any remaining substantial links in academic science between the experiences of taste and knowledge of the real properties and effects of foods.”<sup>1016</sup> This he argues, turned a large portion of “learned society” away from the confidence they could have felt in making their own taste evaluations. “Taste experiences and judgments were filed away in the drawer labelled ‘subjective’, carrying the epistemic health warning that there’s little to be coherently said about them or done with them.”<sup>1017</sup>

This type of claim has, however received some criticism, and many have advocated for more caution. Bensaude-Vincent argues for example that although part of the sensory experience was removed from the laboratory around the advent of the new Nomenclature, the body remained an integral part of the work of chemists.<sup>1018</sup> Anders Lundgren further argues that even in writing, the sensory endured in chemical literature well into the twentieth century.<sup>1019</sup> Whether the death of the sensory is accurate or exaggerated, the described discontinuity of the end of the Enlightenment raises many questions that can be quite directly applied to the present subject. I am therefore interested in investigating how analysts used their own senses. I will argue that the use of the sensory as applied to mineral waters did not in fact reflect the weakness of Galenic vocabulary, rather showing a pointed and replicable use of the senses as an analytical tool.

## The sensory experience of remedies

The early modern medical professions used their senses for a variety of tasks, but one that was particularly important for apothecaries was the evaluation of

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<sup>1016</sup> Shapin, *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*, 14, 36.

<sup>1017</sup> *Ibid*, 46.

<sup>1018</sup> Bernadette Bensaude-Vincent, “Le corps refoulé des chimistes,” in *Essais d'histoire et de philosophie de la chimie*, ed. Bernadette Bensaude-Vincent (Nanterre: Presses Universitaires de Paris Nanterre, 2008), 28. “En conclusion, l’essor de la culture de précision dans les laboratoires de chimie à la fin du xviii<sup>e</sup> siècle ne correspond pas vraiment à un refoulement du corps mais plutôt à un déplacement des fonctions mobilisées. Les fonctions sensorielles de connaissance sont certes disqualifiées au profit des instruments, mais le corps reste au travail.”

<sup>1019</sup> Anders Lundgren, “Kemi, pedagogik och lite estetik: Om sinneskunskap i naturvetenskaplig undervisning och forskning runt sekelskiftet 1900,” in *Löftet om lyckan: Estetik, musik och bildning*, ed. Anders Burman, Rebecca Lettevall, and Sven-Eric Liedman (Göteborg: Bokförlaget Daidalos, 2013).

remedies and pharmaceuticals using taste and smell. The question of the link between good taste and healing properties had been a long debated one. Some ancient medical texts theorised that the sense of taste was a gift which enabled people to distinguish between poisonous and edible substances. According to this logic, the tastier the food, the better it would be for one's health. And conversely, foul tasting substances were likely to be poisonous and should be avoided. There is an intuitive logic to such a classification, as indeed many bitter or acid tastes did correlate with the presence of dangerous substances. But there are some clear issues with such a theory, as countless counterexamples question its universality.<sup>1020</sup> And when it comes to poison detection, a maxim that only works some of the time hardly seems good enough.

The same problem existed for smells, long considered to be substances. Good and bad smells were used to help circulate humours or organs in the body, but the difficulties in correctly placing those senses biologically rendered almost impossible the attempts at a coherent theory of the senses.<sup>1021</sup> This link between pleasantness of the sensory experience and medicinal efficiency had a number of critics.<sup>1022</sup> In the seventeenth century, this question crystallised in the medical controversy between the partisans of Galenic medicine and the partisans of Van Helmont's (1580–1644) medicine. The latter accused ancient medicine of relying too much on taste and ignoring its unreliability. On the other side, many physicians, unsatisfied with the reliance on text alone, saw the use of senses as a way of accessing ancient knowledge free of mediation.<sup>1023</sup> This controversy put into question the habit of tasting remedies as an evaluation of their quality. Essentially both sides claimed to be closer to antiquity, but the heart of the disagreement was the interpretation of sensory data in medicine.

To those that defended them, the senses were one of the most effective tools in order to distinguish real practitioners from charlatans. In the same way that the seasoned eye of a jeweller could tell real from fake gemstones, apothecaries and physicians had to be able to distinguish genuine remedies from fabrications.<sup>1024</sup> Some authors affirmed that a good knowledge of taste and remedies descended from a Hippocratic tradition, unknown to the charlatans and

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<sup>1020</sup> Mandelkern, "The Politics of the Palate: Taste and Knowledge in Early Modern England," 9.

<sup>1021</sup> Richard Palmer, "In bad odour: smell and its significance in medicine from antiquity to the seventeenth century," in *Medicine and the five senses*, ed. William F. Bynum and Roy Porter (Cambridge University Press, 1993).

<sup>1022</sup> Some authors like Montaigne criticised the idea that an unpleasant taste could have physiological virtues. See: Shapin, *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*, 14, 20.

<sup>1023</sup> Mandelkern, "The Politics of the Palate: Taste and Knowledge in Early Modern England," 13.

<sup>1024</sup> Shapin also argues in that direction. Shapin, *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*, 14, 45. "Almost everything about gustatory discrimination before the eighteenth century, and much appearing in that century, concerned the capacity to discern soundness and authenticity."

that henceforth mobilising taste was a way to prove their expertise in discerning the authentic from the fake. In the world of remedies, fraudster could easily imitate appearances, but less so taste and smell.<sup>1025</sup> This aspect of the debate became important in the realm of mineral waters, a market which was also known for its widespread counterfeit alternatives. Good physicians were expected to be able to discern natural from manmade water by taste alone, if they were to stop the fraudulent sales.

These arguments in favour of the inclusion of the sensory can be traced in the medical literature on mineral waters. Fouet's preface on the waters of Vichy discussed the tastes which were known to be associated with healing: "the bitter, the salty, the mild, the acidic, the rough, & the insipid, have very good virtues."<sup>1026</sup> That covered a large portion of the kinds of tastes associated with mineral waters, and thus served as an argument as to why those should be such efficient remedies.

This list of tastes was notable for including both positive and negative taste descriptors. Waters did not always taste good, and yet were still shown to have remedial properties. Because of this, physicians engaged with both sides of the argument. Some celebrated the pleasant taste of a crisp and mellow water, underlining the intuitive link between agreeableness and positive effects. Others reminded the public that physiology could be arcane, and that some benevolent substances could come veiled in unbearable sensory experiences. This argumentation was needed in order to sell the abominable taste and smell of some sulphurous waters. The simultaneous existence of very good and very foul-tasting waters, which both presented remedial qualities, showed the shortcomings in attempting to systematically link pleasantness of the sensory experience with medical effects.

In the case of mineral waters, the taste being good or bad was of heightened importance regarding the public. Although it would be relatively easy for an apothecary to sell a terribly bitter remedy that only needed to be consumed once or twice, waters had to be drunk for days, if not weeks at a time and in large quantities. Consequently, the question of the sensory experience could not be avoided in literature meant for patients. An interesting example of this was the 1775 memoir written by the First physician Raulin, detailing the waters sold at the Paris bureau.<sup>1027</sup> This memoir, according to its preface, was written for the benefit of the public interested in purchasing waters in the capital. It could not afford to dedicate lengthy pages to the details of composition, instead Raulin focused on what he saw as important for his readers. For each

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<sup>1025</sup> Valentina Pugliano, "Pharmacy, Testing, and the Language of Truth in Renaissance Italy," *Bulletin of the History of Medicine* 91, no. 2 (2017), 260.

<sup>1026</sup> Fouet, "Nouveau système des bains et eaux minérales de Vichy, fondé sur plusieurs belles expériences, & sur la doctrine de l'acide & de l'alcali.", preface. "l'amer, le salé, le doux, l'acide, l'âpre, & l'insipide, ont de très grandes vertus."

<sup>1027</sup> Raulin, "Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris."

water, he described the geographical location of the spring, the state of the fountain or tap, and then provided a brief description of the taste, smell and general appearance of the water. He then briefly touched on the different minerals, occasionally alluding to experiments that had been performed as proof. The final part of his summaries, which included the most detail, described the different effects of the waters on health.

It is notable that despite the limited space, Raulin made sure to include the sensory description. He described for instance the terrible smell of the waters of Bilasay. Their taste and smell as well as the appearance of the water were the only clues, or in Raulin's terms "non-equivocal marks",<sup>1028</sup> of the presence of sulphur. Other waters brought about more subtle sensory experiences. The waters of Contrexéville were described as having "no sensible smell", but a "salty flavour, sweetish, very-light, & a little taste of rust which it loses during transport."<sup>1029</sup> Such descriptions were very accessible and relatable to the public, which was an important objective of this treatise.

This inclusion shows the place of the sensory as a tool of communication between physicians and the public, which was an important stake of the scientific literature around mineral waters. It also shows that Raulin did not attempt to hide the awful taste of some waters, or to disguise it in euphemism. The waters of Bilasay were boldly described as having a "disgusting" taste and an "intense & unpleasant smell of rotten eggs".<sup>1030</sup> Raulin was not afraid of honesty; he believed that the public ought to know what to expect when purchasing the bottles. He also clearly had no fear that this would be such a deterrent that it would risk driving business away from the Paris bureau. In the minds of physicians and patients, the pleasantness of the taste of mineral waters was not directly correlated to their effectiveness.

### *The senses as a basic skill of analysis*

Effectively, most analysts, whether they did so deliberately or tacitly, used their senses on the daily.<sup>1031</sup> Physicians performing medical topographies for example would be asked to describe the taste and appearance of the waters they encountered. Even if they were not mineral water experts, their tasting capacities were still considered useful.<sup>1032</sup> The senses were also routinely employed in searches for mineral waters. Simple observation could be used to

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<sup>1028</sup> Ibid, 50. "des marques non équivoques que ces eaux abondent en principes volatils".

<sup>1029</sup> Ibid, 33. "Cette source est très abondante : l'eau en est transparente : elle n'a point d'odeur sensible ; mais on lui trouve une saveur salée, douceâtre, très-légère, & un petit goût de rouille qu'elle perd dans le transport."

<sup>1030</sup> Ibid, 50. "Leur odeur vive & désagréable d'oeufs pourris, leur saveur dégoûtante, le changement de cette odeur en une plus extraordinaire, sont des marques non équivoques que ces eaux abondent en principes volatils, incoercibles, dont il n'est possible de connoître la nature".

<sup>1031</sup> Eddy, "The Sparkling Nectar of Spas; or, Mineral Water as a Medically Commodifiable Material in the Province, 1770–1805.", 201.

<sup>1032</sup> Moussy, "Les topographies médicales françaises des années 1770 aux années 1880, Essai d'interprétation d'un genre médical.", xx.

identify a water that would be worth putting through analysis.<sup>1033</sup> It could also justify the decision not to pursue analysis. For example, the comparable tastes of the different springs in Vallers indicated that the waters were too close in nature to justify separate analyses. The sensory was often used as the gate-keeper to the rest of the analysis in that way.<sup>1034</sup>

Another essential task that was performed in this way was the inspection of the bureaus of distribution. Inspectors were required to pay regular visits to the bureaus in their allotted regions, in order to evaluate the quality of the stock. This was performed solely by appraising the taste and smell of the bottles. If the waters had lost either, they could be declared outdated and be thrown out.<sup>1035</sup> This rested on the idea that taste could detect whether a water was at its peak of quality or not. Similarly, when working with waters, analysts sometimes had to transport bottles all the way to their laboratories. During transport, in order to make sure that the waters were still in good shape, they would use sensory tools, such as colour or taste, in order to test them. If neither had changed, they felt reasonably confident that the waters would be suitable for further analysis.<sup>1036</sup>

Much trust was placed in the analysts' senses, and the sensory was seen as an integral part of the chemical analysis of mineral waters. The first identification of mineral waters was almost always done through taste.<sup>1037</sup> In 1778, the recommendations of the Société de Médecine stipulated that sensory analysis had to be a part of the report. In their recommendations to chemists, the Société indicated that analysing a mineral water was "one of the chemical researches that demands the most resources in the spirit of he who dedicates himself to it".<sup>1038</sup> This admission of difficulty was followed by a number of bullet points of what had to be included in a good analysis. The second point was "2°: One shall distinguish the colour of the water, its degree of transparency, its taste & its smell".<sup>1039</sup>

Another authority on the subject was the very thorough description of the analytical protocol published by the chemist Bergman in his work *Physical*

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<sup>1033</sup> To be clear, analysts did not claim that they could identify minerals through observation alone, but rather, that such observations were reliable enough to pursue further experiments. Memoir on the waters of La Taille, 60e assemblée, (29<sup>th</sup> May 1775), SRM 111B, dossier 27, ASRM. "plusieurs autres sources, couvertes d'une crème jaunatre; qui semblent chargées de quantités de particules ferrugineuses, et sur lesquelles on pourroit faire des experiences utiles".

<sup>1034</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

<sup>1035</sup> Projets de lettres patentes et de réglemens, (1776–1778), SRM 114A, dossier 3, ASRM.

<sup>1036</sup> Venel and Bayen, "Analyses chimiques des nouvelles eaux minérales de Passy.", 19.

<sup>1037</sup> Bycroft, "Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.", 311.

<sup>1038</sup> "Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.", 20. "une des recherches chimiques qui exigent le plus de ressources dans l'esprit de celui qui s'y applique".

<sup>1039</sup> Ibid. "2° : On distinguera la couleur de l'eau, son degré de transparence, sa saveur & son odeur".

and *Chemical Essays*, a much-celebrated text among French chemists.<sup>1040</sup> This treatise underlined the importance of redundancy in analysis, and for that reason highly encouraged the practice of sensory analysis as an initial step.<sup>1041</sup>

In practice, this exhortation to perform sensory analysis appears to have been successful, and to have been in fact already practiced long before the *Société's* injunction. In the array of analytical reports that I have gathered, sensory analysis was the most common type of approach. Eighty-six out of a total of ninety-three texts in the corpus include some form of sensory language in order to describe either the water or its residue.<sup>1042</sup> This clearly demonstrates that despite any controversy that might have existed around the validity of sensory analysis, it did not stop the senses from being used consistently throughout the entire period.

Each water analysis could contain up to four different types of sensory descriptions: observation, smell, taste and texture. I have elected to include the observatory stage with the sensory analysis. Although the visual description of the fountain or the landscape surroundings the waters belong to the environmental description, the description of the appearance of the water itself was typically included alongside the descriptions of taste and smell, hence why they have been grouped together here.

The sensory analysis rarely included all four of these elements at the same time. Around 67% of analyses that did include sensory aspects did so by employing visual descriptors. Smell was less often described, with 54% of inclusions. Taste was by a long shot the most popular sense to relay in an analysis, as 91% of the analysts included it. Finally, the rarest mention was that of texture, which only got mentioned 27% of the time.

Figure 7.1 shows the occurrence of each sense within the complete corpus of analysis reports. I will now unpack each of these categories and study the vocabulary that was employed in order to describe each sensory facet of the water.

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<sup>1040</sup> See Chapter 6.

<sup>1041</sup> Bergman, "Physical and Chemical Essays.", 120.

<sup>1042</sup> See Appendix n°[2] on the inclusion of the different steps of analysis.

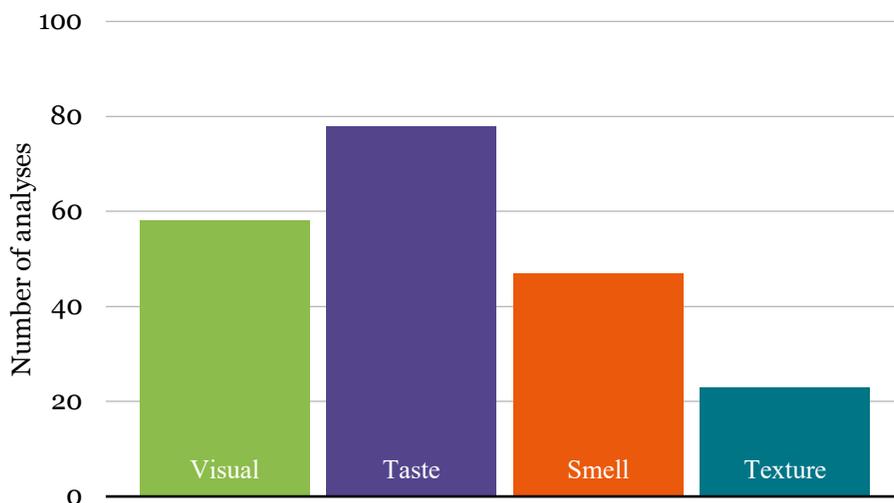


Figure 7.1 Inclusion of the different steps of sensory analysis. By author.

## Transparency, limpidity, faint colours: the initial observation

The first and most straightforward sense was also one of the least helpful in the initial appraisal of the water. A keen eye, although crucial in identifying the shapes of intricate crystal structures in the later parts of the analysis, was a rather ineffective indicator of minerality, since most dissolved substances were invisible to the naked eye. Occasionally though, certain minerals left a noticeable hue in the water, or in the deposit that it left behind. In addition, not all waters were equally transparent, and some springs were clouded by various things, from dust to bubbles. Such observations were typically the first to be included in the sensory analysis, as it was the impression that presented itself to the analyst immediately.<sup>1043</sup>

I first want to give some indications as to how this observational step was performed in practice. The archival record rarely gives clear indications regarding how a sensory analysis was done. To put it simply, most analysts took it for granted that anyone knew how to look at something carefully, and because it was such a trivial act, they rarely bothered to make their visual

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<sup>1043</sup> In this section, I will focus on sense of observation used in order to describe the appearance of a water, at the spring or in a bottle. I will not discuss in detail the variety of other observations of colour regarding the residue analysis, or the use of reagents, as these will be detailed in the next chapter.

technologies explicit. Only in passing, did a few analysts describe the process of looking with more precision.

Marguery's 1723 analysis, perhaps because its tone was often apologetic throughout the text, gave descriptions of his own approach to sensory analysis. He explained that he took the care to put some water in a well-polished glass on a sunny day up to the light in order to appraise its appearance.<sup>1044</sup> This was a lot more efforts than other analysts who simply described giving "a quick glance" at the waters.<sup>1045</sup> A much later analysis made a similar mention to Marguery's, by stating "The water of this spring is very limpid, however, by examining it in a glass, we can see an infinity of moving particles".<sup>1046</sup> These two notes suggest that in order to be thorough, analysts had to do more than simply looking at the water in the fountain it sprung from. Some took the time to put it in a glass container to observe it against the light in order to catch any substance in suspension. In some instances, the analyst mentioned the presence or absence of a deposit, which leads me to believe that most analysts left the waters to sit in bottles for a while, as part of the initial observation.<sup>1047</sup>

The vocabulary used in order to describe the waters visually did not show a large amount of variation. From the corpus of analyses, only twenty-six different qualifiers were used in total.<sup>1048</sup> But interestingly, out of the entire list, only three words appeared more than three times, and they were the words 'clear', 'limpid' and 'transparent', with the first two appearing about thirty times each. Essentially, when the water was visually described, more than half of the time it was simply to say that it was "clear and limpid".<sup>1049</sup>

The degree of transparency was often mentioned, likely in connection with the old association between transparency and quality.<sup>1050</sup> One water was for example noted to keep its transparency even in the rain.<sup>1051</sup> The water could

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<sup>1044</sup> Marguery, "Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.", 37. "L'eau de chacune des sources considerée au Soleil en tems clair, dans un verre bien poli & bien net, m'a representé des Iris fort vives, les couleurs étant toujours rangées dans le même ordre."

<sup>1045</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. "du premier coup d'oeil".

<sup>1046</sup> Marsonnat, "Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais." "L'eau de cette source est très-limpide, néanmoins, en l'examinant dans un verre, on y voit une infinité de particules en mouvement".

<sup>1047</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

<sup>1048</sup> See Appendix n°[3] for a full list of the vocabulary used in sensory analysis.

<sup>1049</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM. "très claires très limpides." ; Analysis of the waters of Capbern by Brun, (1778), SRM 113, dossier 12, ASRM. "L'eau minérale de Cap Berne est claire, et limpide"; Analysis of the waters of Roye by Lassone and Cadet, (earliest 1770), SRM 91B, dossier 32. "Cette eau puisée à son bassin est clair et limpide." ; Analysis of the waters of Veaugarni by Chifoliau, (1783), SRM 93A, dossier 19, ASRM. "Elle est claire et limpide a sa source"; etc.

<sup>1050</sup> Pliny, "Natural History," (Harvard University Press, 2004). Section: Differences in waters, (iii–xvi).

<sup>1051</sup> Méglin, "Analyse des eaux minérales de Sultzmatz en Haute Alsace.", 9. "Les eaux des ces sources sont toutes très-limpides, les temps pluvieux n'en alterent jamais la transparence".

also have a notable colour. The English waters of Bath were famously green, which led to much discussion as to the origin of this odd colouring.<sup>1052</sup> The waters of Passy had a faint yellow colour, described as “a very clear lemon yellow”.<sup>1053</sup> More commonly, a deposit or a dust in suspension could be noted by the careful watcher. Such details rarely failed to be mentioned. The waters of Saint Félix en Quercy contained such a deposit, described as: “therein swims some foreign bodies which only present nothing remarkable, it is nothing but a vegetal and earthy dust which the wind carries in this water.”<sup>1054</sup> In that case, the analyst had the option of differentiating between a deposit in suspension in the water and one that was brought on by weather. This type of observation was precisely why a visual inspection of the spring was important to the analysis. It took a relatively careful eye to be able to see the difference between particles that were part of the mineralisation of the waters, and those that were contaminants.

One apt analyst described how the water was of “great limpidity”, as was often the case, but he added “there exists only some of these light white filaments, which are not easy even for the short-sighted to see”, adding that, to such people, few waters were clear of them anyway.<sup>1055</sup> This mention of the differences in observations between different types of visions suggests that the eye was not exempt from the accusations of subjectivity levered against the other senses. Likewise, it suggests that some analysts took the time to ask others about their own experience of the waters and recorded their impressions in the reports.

When the deposit was a genuine part of the water and not a “foreign body”, its colour also had to be noted. The colour descriptions were marked by the repeated use of the suffix “-âtre”, signifying “leaning towards” or colloquially, “-ish”. The sediments could be “rougeâtre” or “jaunâtre”, which best translates to “red-ish” and “yellow-ish”. The commonality of this turn of phrase implies a difficulty in describing such colours clearly and unambiguously. A faint colour was just as difficult to convey through language as the subtleties of taste.

Some waters were covered by a film at the top, which originated from the water itself and not from dust carried to the spring by wind. One analyst

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<sup>1052</sup> Charles Lucas, “An Essay on Waters: In Three Parts. Treating, I. Of Simple Waters. II. Of Cold, Medicated Waters. III. Of Natural Baths,” (London, printed for A. Millar, 1756).

<sup>1053</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 6. “L'eau de M. de Calsabigi, fraîchement tirée, est aussi transparente que l'eau commune bien filtrée, & est colorée d'un jaune citrin très-clair.”

<sup>1054</sup> Analysis of the waters of Quercy by Perret, (1775), SRM 111B, dossier 26, ASRM. “il y nage quelque corps étrangers qui ne font que présenter rien de remarquable, ce n'est autre chose qu'une poussière végétale et terreuse que le vent transporte dans cette eau.”

<sup>1055</sup> Analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM. “Elle est de la plus grande limpidité ; il n'y existe que de ces légers filamens blancs, qu'il n'est même pas facile d'apercevoir qu'aux miopes, & dont, à leurs yeux, peu d'eaux se trouvent exemptes.”

described a “canvas” which covered the surface of the water,<sup>1056</sup> another, “a pellicle”.<sup>1057</sup> One analyst also mentioned that the water appeared dirty, not because of some noteworthy chemical characteristic, but because of all the leaves that fell in the water regularly.<sup>1058</sup>

Because describing water visually was difficult, the spring was often compared to other kinds of waters, so as to provide a point of reference. Saying for example: “The water of vic looks perfectly like common and usual water”,<sup>1059</sup> was both a very simple and very effective descriptor. While the concept of ‘limpidity’ was loosely defined, “common water” was a generic and accessible label. If the mineral water differed from its regular counterpart, the difference could be described as such: “while they are limpid, and transparent, I have not found this sharpness [*netteté*] and this whiteness which distinguishes good common water;”.<sup>1060</sup> These comparisons could be even more specific. The Passy water was described as being “as sharp [*nette*]” as “filtered Seine water”.<sup>1061</sup>

The majority of the hapaxes related to the transparency of the water or lack thereof. The waters could be described as “diaphanous”,<sup>1062</sup> as having “a small nuance of whiteness”,<sup>1063</sup> “a little cloudy”,<sup>1064</sup> or “without colour”.<sup>1065</sup> One of the more puzzling colour descriptors came from the 1802 analysis which mentioned a “yellow red” deposit, which is not the most intuitive pairing of shades, but shows the attempts at being exact, sometimes to the detriment of understandability.<sup>1066</sup>

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<sup>1056</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “on voit sur leur surface une toÿe, ou espece de toile limoneuse d’une couleur sombre et changeante”.

<sup>1057</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM. “Pellicule à la surface de l’eau”.

<sup>1058</sup> Analysis of the waters of La Touche by Gallot, (1784), SRM 91A, dossier 13, ASRM. “l’eau asses claire quoiqu’un peu salie par les feuilles des arbres qui l’avoisinent et la couvent...”.

<sup>1059</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “L’eau de vic ressemble parfaitement à l’eau commune et usuelle”.

<sup>1060</sup> Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL. “quoiqu’elles soient limpides, et transparentes, je n’y ai pas trouvé cette netteté et cette blancheur qui distingue la bonne eau commune ;”.

<sup>1061</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, 36. “leur limpidité au moins aussi transparente, & aussi nette qu’on la remarque dans l’eau de Seine filtrée.”

<sup>1062</sup> Cadet, “Analyses chimiques des nouvelles eaux minerales de Passy.”, 63. “L’eau Minérale de M de Calsabigi sortant de sa source est très-claire, diaphane, & elle n’est pour ainsi-dire, point colorée;”.

<sup>1063</sup> Thouvenel, “Mémoire chymique et médicinal sur les principes et les vertus des eaux minerales de Contrexeville en Lorraine.”, 15. “claire & transparente, quoiqu’elle ait une petite nuance de blancheur que n’a pas l’eau commune”.

<sup>1064</sup> Analysis of the waters of Vots Douvse by Cuel, (1780), SRM 90 A, dossier 7, ASRM. “ces eaux sont un peu troubles sur les lieux et déposent un sédiment ochreux fort abondant; auprès de la source on remarque une terre argilleuse”.

<sup>1065</sup> Cadet, “Analyses chimiques des nouvelles eaux minerales de Passy.”, 63. “point colorée”.

<sup>1066</sup> Analysis of the waters of the Aveyron by Caucanas, (1802), AJ/16/6697, AN. “le sédiment qu’elle dépose est onctueux, cotoneux, d’un jaune rouge.”

The visual vocabulary was not the only language tool that was used in order to convey meaning. Comparisons and imagery could help the reader by giving concrete things to relate the observation to, and a number of adjectives and adverbs were used around the descriptors in order to refine the meaning. The silvery film on the water was described as “light”.<sup>1067</sup> The water could be limpid, or “very” limpid. Its transparency could be “perfect”.<sup>1068</sup> The use of such words also shows an attempt to reach more precision, even within a limited list of qualifiers.

Still, the visual vocabulary was overall not the most diverse, especially compared to the other senses. This shows that, passed the most obvious qualifiers of brightness and transparency, the endeavour of describing flowing water was difficult. Beyond this, if the water seemed to have no obvious discernible characteristic like the presence of a dust or a particular colour, there was only so much that the analyst could describe, which is likely why many of the initial visual descriptions were quite succinct.

## Taste: the fundamental sense in water analysis

So far, the examination of the visual vocabulary used to describe mineral waters is not supporting the argument for the importance of the sensory very strongly. This is because when it came to the appraisal of waters, the eye was secondary to the mouth and nose. The taste of the water was customarily described right after the visual appraisal. Contemporary intuition might want to insert the description of smell before taste, but this is the order that almost all sensory analyses in the corpus used. Taste was the heart of the sensory analysis. While the initial visual description was not always obviously useful to the analytical endeavour,<sup>1069</sup> taste was both easily noticeable and often directly connected to the presence of certain minerals in the water. The practicalities of how to taste a mineral water can be understood better than the visual stage, as a few authors discussed their method, although often doing so in short asides.

Machy in his ca. 1755 analysis gave hints as to the kinds of actions that led to a good appraisal of taste. He first described being forced to dilute the mineral water in twelve parts of common water because of its intolerable taste. The factor of the dilution served as a way to concretely measure the intensity

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<sup>1067</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. “légere pellicule Argentine”.

<sup>1068</sup> Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 37. “elle [l'eau] est parfaitement claire & limpide.”

<sup>1069</sup> Little could be deduced from the descriptions of transparency and limpidity for example. Only the presence of dusts, pellicles, and foreign bodies, could be directly relevant to the rest of the analysis. The visual description thus served partly as an introductory statement, while the taste description was more directly correlated to the process of identification of minerals.

of taste. He likely tried other dilutions before reaching twelve. He also described the taste of the water changing after keeping it in the mouth for “a certain time”. While not a precise measure, this indicates that tasting the water meant more than simply drinking it. Analysts employed a method in order to best feel and describe taste.<sup>1070</sup>

Another analyst made a similar comment, saying that he had kept the waters “enough time” in his mouth to be able to discern a slight saline taste.<sup>1071</sup> Laprade in his 1770s analyses made mention of tasting the water before and after they had been purged of the air they contained.<sup>1072</sup> Others made similar allusions, tasting the waters after leaving them out for different lengths of time, or before and after transport for example. Tasting was neither a simple act of drinking, nor was it done only once. Many analysts reported drinking the waters several times at different hours or on different days, in order to detect small variations in aroma. This was a way of establishing the stability of the waters. If their taste varied in any way, it indicated that a chemical modification had occurred during transport. The analyst of Saint Martin noted that the: “styptic property of the water increases sensibly the further one gets from the time it was drawn”.<sup>1073</sup> Another analyst described how the waters he worked with lost their “force” after “two or three minutes”, giving a more precise estimate of the instability of those waters.<sup>1074</sup>

An intriguing mention regarding the process of tasting came from the physician Bertrand-Lagrésie, who said: “I began by tasting the waters of pechlaumet on an empty stomach”.<sup>1075</sup> This was not brought up by any other analyst in my corpus, so I am not able to say whether this was a common practice, though it was probably done on purpose, as a way of enhancing tasting

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<sup>1070</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 8. “Cette saveur insupportable n'est qu'étendue sans être changée quand on mêle une partie de ces eaux avec douze parties d'eau commune”; “L'eau non épurée de Madame Belami a une saveur douceâtre, légèrement martiale qu'on garde sans répugnance ; celle qui est épurée ne fait sentir ce goût martial qu'après avoir séjourné dans la bouche un certain temps, & la saveur douceâtre n'a rien de nauséabonde. Je distingue entre saveur vitriolique & saveur martiale ; cette dernière est celle qu'ont les eaux rouillées.”

<sup>1071</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. “Leur goût est un peu ferrugineux, peu austère et elles ne laissent aucune impression salines, quoiqu'on les ait tennues assez de tems dans la bouche.”

<sup>1072</sup> Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL. “ce goût salé ne diminue point d'intensité, quoique ces eaux aient été purgées d'air.”

<sup>1073</sup> Analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM. “cette propriété styptique de l'eau augmente sensiblement à mesure qu'on s'éloigne du tems auquel elle a été puisée”.

<sup>1074</sup> Marsonnat, “Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais.” “Ces eaux sechent le palais, & leur effet est si volatil, qu'elles perdent leur force à la source même, exposées à l'air libre, après deux ou trois minutes.”

<sup>1075</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. “jay commancé par gouter a jeun les eaux de pechlaumet, je les ay trouvees dun gout legerement stiptique et salin”.

capabilities. The same author also alluded to repeated tastings without noticing any difference.

Bernardin when analysing the waters of Uriage, tasted the waters in two different stages. He first tried them as they were at the spring, and a second time after being partially reduced by fire, finding this latter liquid “very bitter of a strong much acrid salty Taste joined with the smell of foye of sulphur”.<sup>1076</sup> This rather unappealing combination was compared to the taste of “human matter”.<sup>1077</sup> But despite the unpleasant experience, Bernardin was the first in the corpus to give an estimation of how long he kept the water in his mouth in order to best appraise its taste, by stating “It is almost impossible to keep it for more than two or three minutes in the mouth”.<sup>1078</sup> This surprisingly long time again suggests the existence of a rarely-spoken rule guiding the process of tasting.

Fourcroy gave in his 1788 analysis a precise description of the process of tasting, by describing the succession of tastes that impressed on his senses:

When tasting the water of Enghien, one experiences first a sort of flavour of hatched egg; but by conserving it some time in one’s mouth, & by stirring it, as one must do, to recognise the mix of flavours, which so often takes place in natural products, one finds, after this flavour of hatched egg, a slight bitterness, followed by a kind of astringency.<sup>1079</sup>

The turn of phrase “as one must do” implied the existence of an established know-how when it came to tasting methods.<sup>1080</sup>

A general reading of water analyses reveals that the senses were not only used in the initial tasting of the waters. Although essential, because it could give clues as to the water’s contents, it was far from the only place in which the sensing body was used. The dry analysis sometimes featured more sensory descriptions than the first tasting. The waters were typically tasted throughout

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<sup>1076</sup> Smell and taste were not always possible to detangle from each other, especially in the case of sulphuric waters.

<sup>1077</sup> Analysis of the waters of Uriage by Bernardin, (1781), SRM 93A dossier 12, ASRM. “En Debouchant une Bouteille d. cette eau il monte tout d. suite au nez, une forte odeur de foye d. souffre asséz ressemblant à l’odeur d la matiere humaine. Si on l’agit elle sent encore davantage et exposée à l’Evaporation, elle sert Beaucoup d. cette odeur, en la Goutant, sur la langue on la trouve très amère d’un Goût salé fort âcre joint à cette odeur d foye d. souffre.”

<sup>1078</sup> Ibid, “Il est presque impossible de la garder plus d. deux ou trois minutes dans la bouche”.

<sup>1079</sup> Fourcroy and Delaporte, “Analyse chimique de l’eau sulfureuse d’Enghien, pour servir a l’Histoire des Eaux sulfureuses en général.”, 38–39. “Lorsque l’on goûte l’eau d’Enghien, on éprouve d’abord une sorte de saveur d’oeuf couvé ; mais en la conservant quelque temps dans sa bouche, & en l’agitant, comme on doit le faire, pour reconnoître le mélange des saveurs, qui a lieu si souvent dans les produits naturels, on trouve, après cette saveur d’oeuf couvé, une légère amertume, suivie d’une espèce d’astringency.”

<sup>1080</sup> Uncovering the forms of these sensory technologies has been one of the objectives of the ‘sensory turn’ literature. Mineral water tasting represents an interesting case study into the sensory habits of early modern science. The exact methods themselves were rarely discussed outright, because despite their sophistication, they were deeply engrained in the practitioners’ habits as something that almost went without saying.

the evaporation process, in order to assess the concentration in products. Generally speaking, the senses of the analyst were not restricted to one step of the protocol but were rather an integral part of the entire analysis. The initial sensory description was the only part of the analysis in which the use of the senses was formalised. But every time that a product called for it, the chemist would not hesitate to smell, taste and feel the different products of the analysis in order to refine his judgment. The following discussion of the vocabulary of taste therefore stems from several different parts of the analysis, not solely the initial appraisal.

The vocabulary used to describe the taste was by far the most varied, with seventy-five different words or expressions being used in order to qualify the taste of the seventy-eight different analyses that included it. As is often the case, the hapaxes take about half of the total pool of words,<sup>1081</sup> which leaves thirty-seven words being repeated at least twice.<sup>1082</sup>

First, it should be said that fourteen waters were described as having no flavour, or as “insipid”, highlighting that just because a water had no taste, did not mean that it went unmentioned. When they did have a noticeable taste, the two most used descriptors, used eighteen times each, were “ferruginous” and “salty”. Anyone that has tasted natural mineral waters will likely not be surprised by this.<sup>1083</sup> The iron taste in ferruginous waters is nearly impossible to miss, and most waters that do not have it do taste of salt in one way or another. Both qualifiers had a few variants, which add to the count. On four occasions, analysts related their experience of tasting something very similar to rusted metal.<sup>1084</sup> Two other analysts described tasting waters that felt as though blacksmiths had used them to put off hot iron, which I imagine belongs to the general category of the ferruginous tastes. This made for a total of twenty-four instances of this kind of taste being detected and described. The taste of iron was only found in the vocabulary describing the taste of the water itself, not the residue. The saltiness, however, was present in all stages of analysis. Similarly to iron, it had a few other variants, such as “salure”. Some analysts qualified which kind of salt they were detecting by directly using the chemical term “marine salt”.

Another frequently used term, at seventeen mentions, was “piquante”, which translates to “sharp” or “prickly”. It was, and still is today, the term usually employed to describes a fizzy water. A further nine mentions went to

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<sup>1081</sup> This is a very common distribution within sets, sometimes referred to as Zipf’s law. It is therefore neither an indication of richness or poverty of vocabulary by itself.

<sup>1082</sup> See Appendix n°[3] for a full list of the vocabulary used in sensory analysis.

<sup>1083</sup> During the years of this research, I had the opportunity to taste a few different mineral waters at the spring, and this impression is indeed often the first that one has upon tasting a water. The spring of Vichy Célestins for example gave me an immediate sensation of saltiness. The waters of Chaudes-Aigues, in addition to being hot, also tasted almost unbearably strongly of iron, making the numerous mentions of iron-related tastes less surprising.

<sup>1084</sup> I have not lumped the adjective “rusty” with the descriptor “ferruginous” as the two appear to refer to distinct tastes in the texts.

the term “aigrette”, which also referred to the air in waters, and was for long used as a category in classifications. In addition, the word “acid” was used seven times, and as Venel highlighted in his treatise, the organ of taste was known for easily mistaking acidity for fizziness, which could also explain the frequency of both mentions.

An often-noted sensation was the feeling of astringency. Many waters gave the palate a feeling of constriction, or that after swallowing, the water left the throat with a sense of dryness. This feeling was described by a few different words, like “styptic”, “astringent”, “astringent”, “drying”, “dryness” and “non-thirst-quenching”. That last term was only found once, but it is perhaps the most explicit of all. The analyst who used it described how drinking this specific water not only failed to quench his thirst, but it made the drinker eager to keep drinking endlessly.<sup>1085</sup> In total, the lexical field of dryness appears twenty-five times.

The list of lesser-used terms and hapaxes reveals the presence of several chemical terms used for comparative purposes. For example, three waters were said to taste like “a solution of vitriol”. This appeared mostly in later analyses, and often included precisions, such as: “the flavour of the concentrated mineral water was the same as that of a water which contains lots of mineral alkali”.<sup>1086</sup> This shows an interesting transfer between sensory laboratory practices and the tasting of water. Only a chemist who was used to the taste of mineral alkali would have been able to make that observation in the first place. More chemical links could be drafted from the sensory stage, like when Nicolas described the taste of the waters of Uriage: “The water in question in this Memoir, only has a salty taste, after the evaporation of the Phlogiston.” The same author also made some precise chemical comparisons, by saying “the tongue is not affected by this harsh flavour which remains after one has tasted ordinary marine salt, magnesite vitriol or vitriolic soda.”<sup>1087</sup> Again, this shows the habits of chemists of tasting their products and of using this base of knowledge to better convey the taste of water. In parallel, giving a precise and chemically based description of taste was a way of voicing hypotheses regarding the contents of the waters in the early stages of the analysis.

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<sup>1085</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM. “elle laisse a près qu'on l'a avalée sur les parties de la bouche particulièrement sur l'arriere bouche une secheresse cette eau non seulement ne désaltere point mais semble au contraire inviter continuellement a boire.”

<sup>1086</sup> Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM. “la saveur de l'eau minerale rapprochée etait la mesme que celle d'une eau qui contient beaucoup d'alkali mineral”.

<sup>1087</sup> Analysis of the waters of Uriage by Nicolas, (1783), SRM 93A, dossier 12, ASRM. “L'eau dont il est question dans ce Memoire, n'a plus qu'un goût salin, après l'évaporation du Phlogistique. Le sel marin paroit y dominer ; mais la langue n'est point affectée de cette saveur âpre qui reste après que l'on a goûté le sel marin ordinaire, de vitriol magnésien ou le vitriol de soude. Cet organe éprouve au contraire un sensation d'onctuosité.”

Some analogies related to drinks rather than chemicals. Almost all drinks comparisons were made to alcoholic drinks, like wine, sparkling wine or champagne. Méglin for example described the waters as having “a sour taste, & a prickliness, which takes to the nose, as do ordinarily the fermented liquors, such as sparkling wines, or new beer &c.”<sup>1088</sup>

A term that often featured in the descriptions of residues was the word “bitter” or the expression “bitterness”. The majority of residues tasted “acid”, “bitter” or “salty”, and they were sometimes described to be “crisp under the teeth”.<sup>1089</sup> Further qualifiers were used, like saying that they burned the tongue, or had a “bland” taste. As these residues were the product of dry analysis and sometimes calcination, this type of vocabulary was to be expected.

The last kind of descriptor that could be found repeatedly throughout the corpus concerned the flavour of the water. A total of nineteen mentions were purely aimed at describing the either agreeable or offensive nature of the water in question.<sup>1090</sup> A bad taste could be a way of flagging that a water had gone bad, like in an example given by Hoffmann, describing an expired bottle which would have “changed its first taste in a repugnant & stale taste, as if one had dissolved wine tartar in it;”.<sup>1091</sup> Most of the time however, the unpleasant taste was linked to the presence of sulphur in some way, and was thus desirable, as sulphur had known curative abilities. A number of descriptors alluded to its presence, like “stale [fade]”, “sweetish” or “hatched egg”, when the taste was not simply described as “sulphuric”, of “Foye of sulphur” or “of sulphur”.

Generally, all sulphuric variations were unpleasant, but the unpleasantness was not mentioned every single time. The waters of Sainte Reine for example, were said to be pleasant to drink in their regular form, but as soon as they were concentrated, they took on a “disagreeable staleness”.<sup>1092</sup> Sometimes the degree of unpleasantness was difficult to gauge. The description of the waters of Donzy by Paret stated: “this water has a stale, and disgusting taste which is yet bearable”.<sup>1093</sup> The term ‘bearable’ aimed at potentially queasy drinkers. It

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<sup>1088</sup> Méglin, “Analyse des eaux minérales de Sultzmat en Haute Alsace.”, 9. “Ces eaux ont un gout aigrelet, & un piquant, qui porte au nez, comme le font ordinairement éprouver les liqueurs fermentées, telles que les vins mousseux, ou la bierre nouvelle &c.”

<sup>1089</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. “son goût fade croquant sous les dents”.

<sup>1090</sup> By this, I mean only words that have a clear laudatory or negative implication, like “désagréable” (meaning disagreeable). I am not including descriptors such as “douceâtre” (sweetish) or “amère” (bitter), which are relatively neutral descriptive terms, despite referring to commonly disliked sensory experiences.

<sup>1091</sup> Hoffmann, “Analyse parfaite des eaux de la fontaine du Bas Selter, traduit de l'allemand en françois par Pierre-Théodore Leveling.”, 4. “mais bien qu'elle aura changé son premier goût en un goût répugnant & éventé, comme si l'on y avoit dissous du tartre de vin;”.

<sup>1092</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM. “si dans cet état [rapproché] on goute l'eau on la trouve d'une fadeur désagréable”.

<sup>1093</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM. “cette eau a un gout fade, et dégoutant mais cependant supportable;”.

was an important distinction though, as some tastes were indeed described as outright unbearable. The analyst of the Bourbonne waters gave an early example of this in his 1736 description, saying that those who drank the water at the spring had no cause for complaints, though “one must admit that one can only discern a saltiness which is quite bearable or light with some kind of staleness afterwards; when they are cooled down, this flavour turns into a bitter taste & [*empiresme*] which is very disagreeable, which is to say almost unbearable”.<sup>1094</sup> The other notable example of such ghastly taste came from Machy’s analysis of the Passy waters, which still presented an awful taste despite going through a twelve part dilution. In order to really convince the reader of the intensity of the experience, the analyst explained: “in this mix they displeas not only delicate people, but even practitioners [read, physicians], who are by their state accustomed to the most ungracious flavours.”<sup>1095</sup> This quote is rather eloquent regarding the spectrum of bad tastes that waters can inflict on their drinkers. Eighteenth-century physicians were indeed accustomed to some of the most awful tastes one can experience, so if even they struggled, the taste must have been truly abhorrent.

This kind of comparison shows the attention that was given to precision and to doing justice to the experience with the use of adjectives and superlatives. While this description might have been exaggerated slightly, the use of imagery in general showed an attempt by the analysts of conveying the experience of taste with as much authenticity as they could.

At the other end of that spectrum were the waters that were pleasant to drink. This concerned nine occurrences. Sometimes, the pleasantness was mentioned in association with another descriptor, like saying that a particular ferruginous taste was “not disagreeable”, since strong iron tastes could sometimes be quite unpleasant.<sup>1096</sup> The same was said after a few other kinds of qualifiers that could be perceived as unpleasant, like “winous”<sup>1097</sup> or

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<sup>1094</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, 30. “Tous ceux qui ont goûté des Eaux de Bourbonne, lorsqu’elles ont été puisées à leurs sources, ne sçauroient dire y avoir remarqué de déboire ; on doit avoüer qu’on y démêle seulement une salure qui est même assez suportable ou légère avec quelque espèce de douceur fade ensuite ; sont-elles refroidies, cette saveur se change en un gout d’amertume & d’empiresme qui est très-désagréable, pour ne pas dire presque insupportable”.

<sup>1095</sup> Machy, “Examen physique et chimique d’une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 8–9. “Cette saveur insupportable n’est qu’étendue sans être changée quand on mêle une partie de ces eaux avec douze parties d’eau commune ; dans ce mélange elles déplaisent non seulement aux personnes délicates, mais même aux praticiens, à ceux qui par état sont accoutumés aux saveurs les plus disgracieuses.”

<sup>1096</sup> Analysis of the waters of Bouillaut by Fleury l’Aîné, (1776), SRM 91B, dossier 33, ASRM. “les eaux prises a la source sont tres chaudes, ont un goût ferrugineux qui n’est point desagréable, elles impriment sur la langue et au palais un piquant qui laisse les parties seches lorsqu’elles ont été avallées”.

<sup>1097</sup> The waters of Saint Galmier which had a wine taste also described as pleasant, although the same qualifier was often understood to be negative. Analysis of the waters of Saint Galmier by

“prickly”.<sup>1098</sup> The most enthusiastic example of this came from the analysis of Reboulet, of which the waters were described as “pleasant to drink”, as well as “refreshing” and more uniquely, had to capacity to render the drinkers “gay” or joyous.<sup>1099</sup>

Many of these taste descriptors were aimed at precision, but they were also intended to be a part of analysis. This is likely why the vocabulary used a mix of common and chemical terms. The taste could also be an indication of other facts about the spring. Laprade for example could tell by the taste of the water that it was not pure, and that the spring was mixed with foreign waters.<sup>1100</sup> Such an observation would be critical in the case of someone wanting to use and distribute the waters.

As mentioned earlier, taste was an indicator of the presence of air in the waters, which was sometimes stated in the sensory analysis, prior to the actual air analysis. The same Laprade mentioned the waters of Montbrison as having “an acidulous taste”, and that this prickly taste came from “an overabundance of air combined with it”.<sup>1101</sup> This was one of many descriptions of taste which had a clear analytical purpose.

More so than the observation stage, the tasting of water was a central tenet of the analysis. Almost no analysis omitted it, and when analysts described their tasting experience, they did so using a rich vocabulary, meaningful comparisons, and nuances which allowed to place each taste qualifier on an adequate spectrum. The widely exaggerated claims were outliers, as the majority of descriptions had a more factual tone and used accessible terms.

A few early eighteenth-century analyses alluded to the subjectivity of taste, as a way of explaining possible discrepancies in experiences rather than dismissing the use of senses altogether. Taste was not constant, and some analysts attempted to do justice to this changing nature. Lemaire explained that “taste finds there a flavour, which is not always the same; sometimes these Waters have a slight sourness, close to that of bad wine [*piquette*]; other times they have a mineral taste, hard to define, which seems to have some resemblance

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Laprade, (1774), Ms 120, f282–283, AAL. “son eau est limpide et a un goût vineux assez agreable”.

<sup>1098</sup> Analysis of the waters of Sail sous Couzan by Laprade, (1775), Ms 120, f279–280, AAL. “leur saveur piquante est très agreable”.

<sup>1099</sup> Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM. “elle a un gout piquant comme le vin mousseux ; elle est agreable a boire, rafraichit et semble rendre guay.”

<sup>1100</sup> Analysis of the waters of the Forez by Laprade, (earliest 1772), Ms 120, f254–257, AAL. “Elle a un gout vineux un peu desagréable, et serait vraisemblablement très piquante si elle n'etait mélangée avec deux sources d'eau commune”.

<sup>1101</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL. “L'eau de ces deux sources est limpide, elle a un goût acidule, et doit son piquant à une surabondance d'air combiné avec elle;”. Another example of this: Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “on reconnoit son existence [au gaz faisant frémir les eaux] a leur saveur piquante et acidule qui diminue en raison de la perte de cet air surabondant;”.

to that of writing ink;”.<sup>1102</sup> This abundance of precisions was most likely intended to explain why drinkers who visited the source after having read the treatise might have different experiences when tasting the waters for themselves. Gavinet made a similar comment when he said that the “alleged sour flavour of these waters has not manifested itself”,<sup>1103</sup> alluding to previous experiences that he could not reproduce. But these differences did not justify parting with the taste description. As Marguery said in his analysis, “While tastes are different, everyone has perceived a ferruginous taste.”,<sup>1104</sup> thus rather elegantly avoiding the issue of subjectivity. Taste was indeed changing, nuanced and difficult to describe. And yet, if a water was truly ferruginous, just about anyone could agree on that.

## Noxious waters and inescapable smells

Although tasting and smelling are and were thought to be linked in many ways, the scents of waters were described using a distinct lexical set. Some descriptors overlapped, but the majority were proprietary. Smell was also one of the senses that was used throughout the analysis. The reduction of waters into residues often caused very pungent vapours, and the burning of certain salts could give distinct olfactive clues as to their nature. For this reason, analysts mentioned smells in two specific moments of the analysis: at the beginning, in a careful and measured way to assess the scent of the water, and throughout the analysis, when the scent of a particular reaction was too strong to be ignored.

The initial phase of smelling could be done using a number of techniques designed to enhance subtle smells. Marguery described the ritual of washing his hands in the water – the word washing might refer to the motion of washing rather than the use of detergent – and then bringing his hands up to his nose in order to better feel the scent.<sup>1105</sup> Sometimes, when no scent could be discerned at first, the analysts shook the bottles and smelled them right after reopening

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<sup>1102</sup> Lemaire, “Essai analitique sur les eaux de Bussang.”, 17. “le gout y trouve une saveur, qui n'est pas toujours la-même; quelques fois ces Eaux ont une légère aigreur, qui approche de celle de la piquette; d'autres fois elles ont un gout mineral, difficile à définir, qui me paroît avoir quelque ressemblance avec celui de l'encre à écrire; ou celui d'une légère solution de vitriol de Mars, dans l'Eau commune ; que quelqu'uns prétendent ferrugineux : quelques fois la saveur de ces Eaux, paroît composée de l'aigrette & de la minérale”.

<sup>1103</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “la saveur pretendue aigrellette de ces eaux ne s'est point manifestée”.

<sup>1104</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, 59. “La première [source] laisse sur la langue une impression d'âpreté qui dure quelque tems, elle racle un peu le gozier ; quelques personnes ont cru sentir qu'elle agace les dents, qu'elle est vineuse, aigrellette, styptique. Quoique les goûts soient différens, tout le monde y a apperçu un goût ferrugineux.”

<sup>1105</sup> Ibid, “c'est une odeur de fer, qui est sur-tout très sensible, quand après y avoir lavé les mains, on les approche du nez.”

them. This would ensure that they would not miss out on a very light scent.<sup>1106</sup> Latronçay used this technique, explaining that the smell of the water changed “if one takes the precaution of putting some [water] in a flask; plugging it, stirring it, opening it, & smelling it right away.”<sup>1107</sup> In 1781, Bernardin, analyst of the waters of Uriage, even showed how unpleasant this experience could be. The waters he analysed had a strong smell of sulphur. But despite this unpleasant experience, he took the care of agitating the water in order to get a stronger impression of the smell. He then smelled the vapours emitted during evaporation and noted that they had the distinct smell of spirit of wine, rather than sulphur, which is likely why mentioned it.

Despite being less often performed than the visual description, the vocabulary around smell presented more variety, with a total of thirty-six different words used.<sup>1108</sup> Interestingly though, the most common scent descriptor in the corpus is “without smell”, which appeared seventeen times. Besides the scentless waters, the most dominant smell, spread across a few different denominators, was without doubt the smell of sulphur. Whether it was called “sulphuric”, “of sulphur”, “hepar sulphuris”, “hatched egg”, “sulphurous spirit”, “Foye of sulphur”, these terms taken together garnered thirty-one mentions. The reason behind this is rather intuitive, sulphurous smells were strong, unpleasant, and highly recognisable, which meant that even the most distracted of analysts would never miss it. Tales of stinky sulphuric waters spread throughout the period. The earliest mention was made by Limbourg, who compared the smell of the waters to, specifically, “half rotten eggs”. He later used the more chemical comparison, saying that the scent was “similar to [the smell] that hepar sulphuris gives, when an acid is added”.<sup>1109</sup> This unpleasant smell could cause some problems with drinkers. Some waters were meant to smell like sulphur, while others, as another analyst explained, only took the characteristic smell of “hatched egg” when they had gone bad.<sup>1110</sup>

Sulphur was a substance that strongly affected smell and taste. Some analysts used the descriptor “Foye of sulphur” to describe the impressions of both.<sup>1111</sup> The strength of this feeling could be confusing to analysts when the rest of the chemical experiments could not identify its presence. This happened in the case of the Orléanas water which had “a sulphurous smell

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<sup>1106</sup> Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM. “Elle n'a pas d'odeur apparente, lors même qu'on l'agite dans les bouteilles”.

<sup>1107</sup> Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM. “Ces eaux ont un fumet Minéral, une odeur ferrugino sulphureuse, odeur qui devient plus sensible ; si on prend la précaution d'en mettre dans une phiole ; de la boucher, la remuer, l'ouvrir, & les sentir tout de suite.”

<sup>1108</sup> See Appendix n°[3] for a full list of the vocabulary used in sensory analysis.

<sup>1109</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, 89. “l'odeur des Eaux, qui est une odeur d'oeufs à demi pourris, semblable à celle que donne le hepar sulphuris, lorsqu'on y ajoute un acide”.

<sup>1110</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

<sup>1111</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM. “Elle exhale une foible odeur de foye de souffre. Elle fait dans la bouche la même sensation.”

although the analysis has not been able to demonstrate the presence of sulphur".<sup>1112</sup> Like other smells, sulphur could also be used to gauge the stability of the waters. When a water suddenly gained a sulphuric smell, it could mean that it had gone bad, but if a sulphuric smell that was supposed to be present disappeared, that was also a sign that the water had changed in quality.<sup>1113</sup>

The presence of sulphur in the descriptions of smell went hand in hand with the presence of negative sensory vocabulary. Although the terms "ferruginous", "of laundry", "soapy", and "of ink" appeared a few times, the entire top of the list of descriptors, and a good number of the hapaxes are taken by unambiguously bad smells, such as "fetid", "of human matter" and "infected". "Unpleasant" appears six times, but unlike with taste, there was no "pleasant" counterpart. Fourcroy explained in his historic overview: "The water of Enghien exhales a smell so fetid & so unpleasant, that the local inhabitants have designated it [...] under the name of stinky Stream".<sup>1114</sup> This was hardly an exaggeration. Sulphuric waters do not play well to our current sensibilities, but the early modern public and even scientific practitioners were seemingly just as sensitive to them. Morell gave an indication of this, when he expressed how regrettable it was that the hotel was so far from the spring of Habsbourg. He did concede though, that given the water's sulphuric smell, some distance might have been better for business, all things considered.<sup>1115</sup>

Unlike taste and appearance, the descriptions of scents sometimes addressed more than the smell of the water itself. When it came to visiting a spring, the smell of the water could be a part of the wider environment, not just the fountain itself. An example of this would be Méglin's description of the waters of Sultzmat, wherein he described the most pungent smell which was to be found in the bath room, where the water was heated, as compared to the spring which emitted a less noticeable scent.<sup>1116</sup> Rostain's description of the buildings in Saint Alban mirrored this description, by saying: "If we enter in the surroundings of the fountain, in the morning, or at any time in

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<sup>1112</sup> Analysis of the waters of Orliénas by Lanoix, (1778), Ms 120, f203–206, AAL. "L'eau est claire à sa source, a le gout ferrugineux et une odeur sulphureuse quoique l'analyse n'aie pû y démontrer la présence de soufre".

<sup>1113</sup> Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM. "elle rend une odeur de jus ferrugineuze qui se fait ressentir à une certaine distance, et quelle ne retient pas une heure après quelle a été séparée de la source."

<sup>1114</sup> Fourcroy and Delaporte, "Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.", 36–37. "L'eau d'Enghien exhale une odeur si fétide & si désagréable, que les habitans des environs la désignent, comme nous l'avons déjà dit, sous le nom de Ruisseau puant"; "elle répand une forte odeur de foie de soufre, ou parfaitement semblable à celle des oeufs couvés."

<sup>1115</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM.

<sup>1116</sup> Méglin, "Analyse des eaux minérales de Sultzmat en Haute Alsace.", 9. "les 5. premières sources n'ont point d'odeur, étant froides; mais chauffées, elles contractent une légère odeur de lessive, qui est très sensible dans les salles des bains."

nebulous weather we can smell a scent, like that of writing ink.”<sup>1117</sup> In this case, the weather had an effect on the perception of smell, possibly because the fog was believed to carry the scent better than clear weather would.

Most of the other kinds of scents were found in later parts of analysis. In those cases, smells were used in order to identify specific products or reactions. Tissier wrote that “a light smell of iron” which could be sensed around the glass apparatus made him suspect that “some gas of fatty nature” was released during the reaction.<sup>1118</sup> In another analysis, the use of vitriolic acid resulted in white vapours with a noticeable “smell close to that of soap”.<sup>1119</sup> The analyses made in the later decades of the eighteenth century were consistent in their habit of reporting the scent of products at each stage of the procedure. A good example of this was the analysis of the waters of Saint Honoré which was performed somewhere between 1784 and 1787. The scent was described during evaporation, where it had a “sulphurous phlogiston smell”. The leftover liquor was then described to have “a strong smell of laundry”, and finally, the salt left after separation of the residue had “a light smell of volatile alkali”.<sup>1120</sup>

Like the senses of taste and observation, the smells of mineral waters were described with some care in the analysis reports. The vocabulary was enriched with the use of adjectives and adverbs, helping to place each descriptor on a scale of intensity. The smells were “very sensible”, or “very light”. They changed depending on the place or the weather. The different texts cited here suggest that smell was often so obvious, and so near impossible to miss, that it automatically became an important part of both analysis and public perception of the water. Likely because of this, there was no sign of disappearance of smell from chemical analyses up to the very end of the period covered here. If anything, towards the end of the century, the smells of the residues, salts and other products of analysis were even more consistently mentioned than before.

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<sup>1117</sup> Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM. “Si l'on entre dans l'enceinte des fontaines, le matin, ou à toute heure dans un tems nébuleux on y sent une odeur, telle que celle de l'encre à écrire.”

<sup>1118</sup> Analysis of the water of Orliénas by Tissier, (1778), SRM 91A, dossier 2, ASRM. “elles ont une légère odeur de fer ternissent un peu les parois du verre, et font soupçonner qu'il s'en dégage quelque gas d'une nature grasse.”

<sup>1119</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “et on aperçoit des vapeurs blanches dont l'odeur approche de celle du savon”. A similar example in: Analysis of the water of Orliénas by Tissier, (1778), SRM 91A, dossier 2, ASRM. “[résidu] amer, piquant, laissant exaler une odeur urineuse”. “Il s'est dégagé une odeur d'acide gazeux semblable a celui du vin de Champagne.” Or in: Analysis of the waters of the Aveyron by Caucanas, (1802), AJ/16/6697, AN. “quant à la portion dissoute par l'alkool, pesant à peu près IV grammes et d'une odeur très désagréable, on l'a considérée comme formé d'extractif de muriate de soude”.

<sup>1120</sup> Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. “Odeur phlogistique sulfureuse”; “forte odeur de lessive”; “une legere odeur d'alkali volatil”.

## Light or slimy: the textural description

The final part of the sensory protocol was a little more evasive. I have elected to call it the textural description of waters. Texture was the least varied category, with only twenty different words used to describe it.<sup>1121</sup>

Three main categories of descriptors emerge from the list of textural vocabulary. The first was in regard to the lightness of the water. On four occasions, a water was described as feeling light simply to the touch. These mentions, although not numerous, are important because the idea of lightness was seen as a desirable quality in a water. As the use of areometers became more widespread, the measure of lightness was transferred from the sensory category to the physical analysis, allowing for a precise measurement of weight. But when this measure was absent, a more qualitative comparison to common water could be included. Chevalier said of his waters “They are lighter, abstraction be made of their minerals, than the best common water.”<sup>1122</sup>

The second textural quality pertained to the surface of the water. This was sometimes also linked to the presence of a gas. If the water surface was highly agitated, or bubbly, it could be mentioned as part of a textural description. The analyst of the waters of Availles said for example: “they are cold although they bubble”.<sup>1123</sup> This “bubbling” was a common occurrence. Many analysts made distinctions between the bubbling that appeared in the form of either small jets, or a light shudder.<sup>1124</sup> But most of the time, the presence or absence of airs was not part of the textural description, as it tended to receive its own section, or to be discussed as a component of taste.

The third and most varied textural category was that of oily, greasy, or soft waters. This type of texture was the only one that was consistently mentioned when pertinent, as it was very noticeable. The 1747 analysis of the waters of Barèges said that those waters were principally remarkable by their smell of hatched eggs, as well as “their quality to the touch” which made some people compare “these waters to oil”.<sup>1125</sup> This oily texture was often correlated with sulphuric and soft waters. A later analysis described the feeling of touching the waters of Sainte Reine, stating “touching it renders the fingers soft and

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<sup>1121</sup> Some terms such as “hot”, and “cold” have been included in this category because they were mentioned alongside more obviously textural qualifiers.

<sup>1122</sup> Chevalier, “Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques.”, 5. “Elles sont plus legeres, abstraction faite de leurs minéraux, que la meilleure eau commune.”

<sup>1123</sup> Analysis of the waters of Availles, (1777), SRM 112, dossier 14, ASRM. “elles sont froides quoiqu'elles bouillonnent”.

<sup>1124</sup> Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM. “on n'y voit ni jets ni bulles apparentes a sa surface.”; Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “frémillante”.

<sup>1125</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL. “Les eaux de barege sont principalement remarquables par odeur et un gout très fort d'oeufs couvés par leur qualité au toucher telle que quelque uns de ceux qui prenent les comparent cet eaux a de l'huile”.

slippery, roughly like soaps.”<sup>1126</sup> Within that category, some descriptors were less appealing, like the waters of the Pyrenees which were described as “slimy” and “viscous to the touch”.<sup>1127</sup>

Even in this sparser sensory category, the terms used in order to describe the feeling reflect an attempt at transmitting the experience with some precision. The waters were qualified as feeling like an “oil”, a “fine oil”, a “soap”, as being “smooth” [*onctueuse*], “bituminous”, which is a similar term but grounded in chemical vocabulary, “viscous”, etc.

This category also presented a problem when it came to the general understanding of the chemistry of mineral waters. Some disagreement existed around the question of oils in waters, and whether some mineral springs could contain oily or bituminous substances as part of their mineralisation. One analyst, upon coming across such a substance as the result of his analysis, first dismissed it as impossible, but then went on to recall his lessons in chemistry in which the possibility of having certain minerals wrapped in a layer of oil was brought up.<sup>1128</sup> In the report on this analysis, the chemists Bucquet and Coquereau noted that although possible, this claim needed further experimentation if it was ever going to be supported, as this went against the general theory of dissolution and affinity.<sup>1129</sup>

Overall, like the description of the smell, or the visual inspection, the inclusion of textural descriptors was only done when the waters felt noticeably different from common waters. And unlike the other sensory categories, the texture of the water was easiest to omit in favour of different appraisal methods. That is not to say that it was included less and less. Again, towards the end of the century, as analyses often had to be more thorough, they tended to include every possible observation, including textural descriptions.

## Using the senses as self-evident

Since the reliability of the sensory has been one of the major topics of discussion within the historiography on the sensory, I want to bring the perspective of the analysts themselves on this issue and discuss whether they saw the ‘subjective’ nature of the sensory experience as an issue. The question of whether sensory analysis had to be performed is a more or less foregone conclusion now. I have showed that its inclusion was recommended by the most authoritative protocols of the time, and that it was empirically practiced by the vast

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<sup>1126</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM. “en la touchant elle rend toujours les doigt doux et glissant, a peu près comme les savons.”

<sup>1127</sup> Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM. “elles sont gluantes, et visceuzes as toucher”.

<sup>1128</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

<sup>1129</sup> Report by Bucquet and Coquereau on the analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

majority of analyses. But as has been showed in prior chapters, the analysts were not shy about sharing their opinions regarding chemistry and its methods in the reports, allowing me to present a brief exploration of what they thought of the sensory.

One of the earliest examples of a discussion on the sensory and mineral waters that I have come across was in the 1697 published letter by Barthélémy Linand, in which he defended his prior work on the waters of Forges against the criticism that it had recently garnered.<sup>1130</sup> One of the critics alleged that the Forges waters contained no iron at all, despite what Linand claimed in his earlier work. This point was the first to be addressed in the response, as Linand proclaimed: “I have nothing to say to those who want to argue against the general & uniform sentiment of all, that the Waters of Forges are not ferruginous, if not that they must be persuaded that nothing can be known of the nature of Mineral Waters, by the report of the senses”.<sup>1131</sup> As Linand’s rhetoric suggested, believing that nothing could be known from the senses was so utterly absurd that it needed no further rebuttal. He added that perhaps such critics had lost their perception of smell and taste. Some apparently had the audacity to claim in his presence that the Forge waters’ taste only came from silt or common earth. Linand had nothing to respond to these fabrications, except that such poor judgment must have come from “depraved organs of taste & smell, [that were] much different from everyone else’s.”<sup>1132</sup> In short, he argued that the mineral waters of Forges did contain iron, because they tasted like iron, and only an abnormal person would think otherwise. This kind of argument pulled on the universal side of the sensory rhetoric. And by doing this, Linand indirectly made a strong case for the use of senses in chemical analysis.

In the decades following Linand’s passionate defence of the sensory, a few more nuanced takes on the topic could be found dispersed throughout the analyses. The discourse around the validity of the senses in medicine also had its counterpart in chemistry, including in some reference books in the field. Boyle’s works for example uttered words of caution in trusting smell solely as a way of identification.<sup>1133</sup> One area that could deceive the senses in water chemistry was the gaz. Since an aerated water could give a tingling sensation close to that of a very diluted acid, taste alone could not always tell them apart.

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<sup>1130</sup> Linand, “Lettre de Me. Barthelemy Linand docteur en medecine écrite à M le 15. octobre 1696 où il répond à quelques objections qu'on a faites contre son livre des eaux minérales de Forges.”

<sup>1131</sup> Ibid, iii. “Je n'ai rien à dire à ceux qui veulent soutenir contre le sentiment général & uniforme de tout le monde, que les Eaux de Forges ne sont point ferrées, sinon qu'il faut bien qu'ils soient persuadez qu'on ne peut rien connoître de la nature des Eaux Minérales, par le rapport des sens ;”

<sup>1132</sup> Ibid, “Et quand ils soutiennent, comme on me l'a fait à moi-même, que ces sentiments qu'elles donnent, ne sont qu'une odeur & un goût de vase, ou des terres qu'elles ont lavée ; je n'ai encore rien à répondre à ces critiques, sinon qu'ils ont assrément les organes du goût & de l'odorat depravez, & fort differens de ceux des autres.”

<sup>1133</sup> Boyle, “Short memoirs for the natural experimental history of mineral waters : addressed by way of letter to a friend.”

In order to differentiate them, Venel called the acidic taste “true & fixed”, as opposed to the “acidulous” taste given by dissolved air.<sup>1134</sup> Priestley too, in his work on airs, made a mention of this common error, saying that the ancients “likely deceived by taste”, believed aerated waters to be acidic.<sup>1135</sup>

At times, analysts would criticise other’s works because of their misuse of sensory analysis. Morell, commenting on a previous version of an analysis showed that his predecessor had assumed the waters to contain alum and vitriol based on taste alone. His commentary only read “/:What conclusion without any proof:!/”.<sup>1136</sup> This in itself should not be seen as an outright dismissal of the use of senses, but rather as a criticism of the use of nothing but the senses in order to make definitive conclusions about the contents of a water. Another analyst explained that unlike his own predecessors, he could not detect the supposed presence of an acrid taste in the water, but did not add much in terms of explaining the discrepancy.<sup>1137</sup> The reviewer of the *École de Médecine*, upon reading this succinct report, expressed his discontent regarding such a lack of precision. He expressed his surprise that a water which was described as ochre in colour contained no iron. In addition, the lack of smell description made the interpretation difficult, and the water likely would have to be analysed again.<sup>1138</sup>

In many instances, the sensory was one of several steps in establishing a fact about a water. Marguery – often cited in this chapter for his helpfully descriptive attitude towards analysis – explained that the waters he studied contained sulphur, as “proven by the Pyrites, by the smell, by the blue flame, and the bituminous earth.”<sup>1139</sup> The smell was one of many indicators, which taken together, were solid enough to warrant the qualificative of ‘proof’.

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<sup>1134</sup> Venel and Bayen, “Analyses chimiques des nouvelles eaux minérales de Passy.”, 19. “3°. Cette saveur est réelle & fixe; ce n'est pas le piquant ou le Gratter qui dans les eaux aérées en a imposé pour de l'acide, & leur a fait donner le titre d'Acidules, c'est le goût propre d'un sel dont nous démontrerons la nature dans la suite de cet écrit ;”.

<sup>1135</sup> Priestley, “Manière d'imprégner l'eau d'air fixe, et de lui communiquer les propriétés de l'eau de Pymont, et de toutes les eaux minérales qui sont connues sous el nom d'acidules ou Aériennes.”, 40. “sans doute trompés par le goût”.

<sup>1136</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM. “La partie saline fut desséchée et cristallisée : le sel pour le goût ressembloit au sell commun : il avoit cependant quelque chose de mordant et d'astringeant. Ils crurent qu'il devoit être necessairement impregné de particules d'Alun et de Vitriol. /:Quelle conclusion sans aucune preuve:!/”

<sup>1137</sup> Report by Deyeux on the analysis of the waters of Bourg, (An IX), AJ/16/ 6698, AN. “quant à la saveur acre que dit avoir trouvée à l'eau de Bourg ou n'entend par d'ou elle pourroit venir à moins de supposer la présence d'une assez grande quantité de muriate calcaire”.

<sup>1138</sup> Report by Deyeux on the analysis of the waters of Monestier, (ca. 1806), AJ/16/930/A, n°497, AN. “Ce qu'il y a d'etonnant c'est d'entendre dire à l'auteur que ces eaux ont une saveur fade sans qu'il specifie si cette saveur est celle qu'elles ont à la source, ou si elle ne l'acquiert que lorsque le dépôt est formé.”

<sup>1139</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, 32. “Elle donne du souffre, prouvé par les Pyrites, par l'odeur, par la flâme bleüe, par la terre bitumineuse.”

This attitude towards proof can be found in more reports. Baudry said that “Already by the sole help of the eyes & the senses without there being any need to put in place any operation of the art, we could well content ourselves with the lights we have had on these Mineral Waters”.<sup>1140</sup> The sole recourse to “the eyes & the senses” was not actually enough, as he persisted with a few more analytical techniques, but the sentiment expressed was still that the sensory was a meaningful method of enquiry, which informed the chemist in useful ways. In general, when analysts had positive attitudes towards the sensory, they often claimed that the senses were excellent at recognising substances, but that further techniques were necessary for a more assured result.<sup>1141</sup>

Marguery and Baudry published their respective analyses in the beginning of the eighteenth century, but there were plenty of examples of similar trust put into the senses from the end of the period. A 1778 analysis showed the exact same approach to the establishment of proof, one that is only enhanced by multiplying the steps to reach it. La Martinière, in his analysis of the waters of Saint Santin, wanted to prove that the waters were *not* alkaline, despite what the violet syrup suggested.

One would be wrong to conclude that this Water is alkaline; it is not. I assured myself of it by the following means:

1° I have tasted them with the most scrupulous attention and I have felt nothing alkaline.

2° No acid be it vegetal or mineral, has produced the slightest Effervescence.

3° instructed by M. Monnet that a salt with an earthy base is a very good way of discovering alkali in a mineral Water, I have employed the oil of lime which has not been decomposed.<sup>1142</sup>

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<sup>1140</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, 44. “Déjà par le secours seul des yeux & des sens sans qu’il soit même besoin de mettre en oeuvre aucune opération de l’art, nous pourrions bien nous contenter des lumières que nous avons eu de ces Eaux Minérales”.

<sup>1141</sup> In another example, the analyst explained that the results of the sensory analysis were enough to put the waters in the classification of cold and ferruginous waters, but that further analysis would be needed in order to determine the proportions of this mineral. See: Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM.

<sup>1142</sup> Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM. “Le syrop violet lui donne dans le moment même une couleur verte plus ou moins foncée. On aurait tort d’en conclure que cette Eau serait alkaline ; elle ne l’est point. je m’en suis assuré par les moyens suivans : 1° je les ai goûtées avec l’attention la plus scrupuleuse la? je n’y ai senti rien d’alkalin. 2° Aucun acide soit végétal soit minéral, n’y a produit la moindre Effervescence. 3° instruit par M. Monnet qu’un sel à base terreuse est un très bon moyen pour découvrir l’alkali dans une Eau minérale, j’ai employé l’huile de chaux qui ne s’y est nullement décomposée. je n’attribuirai donc la couleur verte que le syrop violet donne à l’Eau de St Santin qu’au fer et à la terre absorbante qu’elle contient.” Line breaks added for readability.

The absence of taste, in combination with two other methods, was considered a strong enough proof to outweigh the results of violet syrup.

In the latest parts of the period at hand, the ca. 1780–93 analysis of the waters of Manosque claimed that the taste of the water alone was enough to know that it contained marine salt.<sup>1143</sup> The 1787 analysis by Gastellier explained that “by smell and the first glance, I had already judged of the kind of metal that these Waters contain in dissolution”. He added that he only used his reagents in order to confirm this initial impression, and to make sure that he had not missed other principles.<sup>1144</sup> And finally, the analysis of 1802 by Tingry stated “the sulphurous and hepatic smell of the water in question, was more than sufficient to make one believe that it contains some sulphuric hydrogenous gas”.<sup>1145</sup>

The analytical reports contained no eloquent discrediting of the use of the senses. At most, some analysts mentioned the need to be thorough, and not to base conclusions on the sensory alone. But none of them outright dismissed its necessity. The only argument against the use of the senses could be said to come from the few analyses that included no sensory descriptions. But even those only represented seven out of ninety-three cases, and six of those could be considered to be succinct analyses, meaning that they only included some of the analytical steps, or were short reports of a longer analysis.<sup>1146</sup>

This leads me to conclude sensory analysis was an important step in chemical analysis, from the perspective of those who conducted them. It served as a safeguard against the imprecisions of the rest of the chemical analysis, helping to catch potential mistakes early. The sensory also provided analysts with a quick and completely free way of asserting the quality of a water, which was helpful in the initial stages of establishing the minerality of a water. At the same time, the sensory analysis itself also had to be safeguarded against aberrations by the rest of the chemical analysis, since the senses could be deceived by the complexities of mineral waters. Discrepancies in experiences did exist, but this was well-known by all analysts. Overall, they used sensory analysis regularly, with little apprehension, and even reprobated their colleagues who failed to do the same.

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<sup>1143</sup> Analysis of the waters of Manosque by Bouteille, (between 1780 and 1793), SRM 90A, dossier 4, ASRM. “le gout de cette eau suffit pour faire connoître qu'elle contient du sel marin.”

<sup>1144</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “Quoy que par l'odorat et du premier coup d'oeil, j'eusse déjà jugé l'espece du metal que ces Eaux tenoient en dissolution, je n'ay pas moins eu recours, pour en être plus certain et pour connaître en même tems les autres principes que ces Eaux contiennent à l'usage des reactifs suivans.”

<sup>1145</sup> Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN. “l'odeur sulfureuse et hépatique de l'eau dont il sagit, étoit plus que suffisante pour faire croire qu'elle contenoit de gaz hydrogène sulfuré mais il falloit déterminer s'il y étoit seul où associé à plusieurs autres.”

<sup>1146</sup> For example, only three of those seven analyses included the use of the reagents, despite them being a very common analytical method.

## Mediating the senses through language

In conclusion of this chapter, I want to address the particular point of language, and whether it represented a barrier, or at least a significant bottleneck in the usability of the sensory in establishing facts about mineral waters, and convincing audiences about the reliability of these facts.<sup>1147</sup> One narrative within the history of chemistry implies that the fickle and unreliable nature of the senses made space in the late eighteenth century for a new scientific approach to analysis, which gradually phased out the sensory from scientific and expert usage. This strand of scholarship states that while the immediacy of the senses had made them an exceptionally efficient way of identifying substances quickly and intuitively, the individual nature of the experience hindered communication between actors. Even if a sense like taste were to be universal, the lack of appropriate linguistic tools failed to do justice to the sophistication of the lived sensory experience.<sup>1148</sup>

Was the eighteenth-century vernacular insufficient to express what drinking a mineral water felt like? Were the tools available to analysts for transmitting the sensory experience really that blunt? Some of the literature explored in the introduction of this chapter would argue as much. There is evidence that because taste, or smell were rooted in both individual and cultural circumstances, they have been shown to resist definitive classifications.<sup>1149</sup> But being inconvenient to classify need not imply a scarcity of vocabulary. The existence of terms that overlapped several senses for example, while complicating classification attempts, does not imply that those words were stripped of meaning.

If the senses were in fact conveyed using a very limited pool of words, it would be unlikely that practitioners succeeded in having intelligible and productive exchanges around their sensory experiences. This would foster doubts around the possibilities of using the senses analytical tools and support the theory of the quantitative obsession of nineteenth-century scientists being rooted in the shortcomings of the sensorial approaches to nature.

The article *Changing Tastes*, written by Steven Shapin, embodies the argument for the lack of diversity of eighteenth-century vocabulary.<sup>1150</sup> His paper covers a wide temporal range, with a focus on the early modern period as a moment of transition in the sensory realm, especially for the sense of taste. The central point of the article is summarised in the following statement: “in the early modern culture of taste – a culture which indeed remained

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<sup>1147</sup> Here, I am referring to “scientific facts” in a Fleckian sense. Fleck, *Genèse et développement d'un fait scientifique*, introduction.

<sup>1148</sup> Jeffrey M. Pilcher, “Cultural Histories of Food,” in *The Oxford Handbook of Food History*, ed. Jeffrey M. Pilcher (Oxford University Press, 2012).

<sup>1149</sup> See: Paul Freedman, ed., *Food: The History of Taste*, California studies in food and culture (University of California Press, 2007).; David Howes, *Sensual Relations, Engaging the Senses in Culture & Social Theory* (The University of Michigan Press, 2004).

<sup>1150</sup> Shapin, *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*, 14.

substantially stable since Roman Antiquity – how things tasted had ontological bearings: the taste of things testified to how things ultimately were; taste also had epistemological implications, in that taste-based knowledge was regarded as secure”.<sup>1151</sup> This he argues, changed during the late seventeenth and early eighteenth century. Citing mostly classical sources, Shapin argues that in this transitional time, “The subjective experiences of how things look, feel, sound, smell, and taste are not to be taken as reliable indications of how they are.”<sup>1152</sup> This change in paradigm stripped the senses of the possibility of stating anything factual about the world.

In order to support this thesis, Shapin argues for a cultural approach to taste, and emphasises the importance of “the available vocabularies for talking about them and describing them to others.”<sup>1153</sup> This discussion of vocabulary is of most direct relevance to the present chapter. Shapin asserts that from Aristotle to Galen to Locke, vernacular descriptors of taste were relatively weak. “Expertly formulated lists of fundamental tastes did not typically run to more than a dozen items.”<sup>1154</sup> Shapin argues that a narrow vocabulary was commonplace in fields like oenology, but also in scientific fields, such as natural history.<sup>1155</sup> These limitations in the language used to convey taste are presented as a reason for its abandonment from scientific practice.

And yet, a close read of eighteenth-century mineral water analyses shows that this interpretation is not satisfactory. In analytical reports, the limits on vocabulary were not as drastic as the “dozen” of words expected by Shapin. In total, throughout eighty-six analyses, 157 unique terms were used in order to describe the sensory experience, and that does not include the visual descriptions of residues, or the inflected forms of the terms used.<sup>1156</sup> When factoring in repetitions, these terms add up to 457 instances in which a sensory

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<sup>1151</sup> Ibid, 27.

<sup>1152</sup> Ibid, 29.

<sup>1153</sup> Ibid, 8.

<sup>1154</sup> Ibid, 13–14. “Locke was right: early modern repertoires for describing the smells and tastes of food were neither extensive nor very discriminating. Little had changed from Antiquity. Apart from the Galenic terminology, common early modern vernacular terms for describing the tastes of foods and drinks were limited: sweet, bitter, sour, sharp, delicious, luscious, rough, sapid, salty, stinking, aromatic, brisk, rough, piquant, fragrant, delightful, pleasant, gross, good, and so on – but not on and on. Expertly formulated lists of fundamental tastes did not typically run to more than a dozen items.”

<sup>1155</sup> Shapin gives a telling example of this, describing how in 1750, discussions of taste could be a diplomatic choice of table conversation when dining with temperamental guests: Ibid, 43. “The ability to talk about gustatory experiences was at that time becoming a tool of politeness. In the 1750s, the earl of Chesterfield instructed his son that ‘There is a fashionable kind of small talk which you should get: which, trifling as it is, is of use in mixed companies, and at table, especially in your foreign department; where it keeps off certain serious subjects, that might create disputes, or at least coldness for a time. Upon such occasions it is not amiss to know how to parler cuisine, and to be able to dissert upon the growth and flavour of wines.’”

<sup>1156</sup> Regarding the sense of sight, focus was kept on the vocabulary used to describe the waters themselves in the initial analysis. See Appendix n°[3]. In addition, the words were stemmed and grouped together.

descriptor was used, meaning than on average, each water was described using more than five sensory terms, including one hapax.<sup>1157</sup> If I were to make a more conservative estimate, one that only includes words that appeared at least twice, so as to remove potential eccentric writers from the average, and if I were to limit the scope to specifically taste-related vocabulary, the complete list would still contain thirty-seven unique terms, thus widely surpassing Shapin's estimate of a dozen.

The presence of repetitions is I believe not to be interpreted as a limit, or as a necessary consequence of lacklustre terminology. Although some words spoke more to habit than authentic experience, this was also done as a way of using recognisable descriptions that would speak to the eclectic audience of analysis reports. If most analysts resorted to using the terms "hatched egg", "limpid", or "marine salt" over and over again, it was also because they knew that these terms would be meaningful to both people in their profession and to the public. The proportion of repeated words to hapaxes is rather typical and shows that analysts constantly balanced a tendency to use widely recognised words, with terms that were more original, and perhaps more accurate to their own personal experiences. While most analysts simply described the waters with the universally understood word "transparent", two of them used the more unusual but more expressive term of "diaphanous", which rather well suggests both the idea of transparency, and the light white cloudiness that does exist in many mineral waters at their spring. These more unique descriptions also spoke to the fact that analysts often had to write these descriptions for themselves too. Since many analysts travelled to the spring only once to make their initial appraisal, and later performed the rest of the experiments back at the laboratory, they also needed to record their own sensory experience, in order to be able to judge whether the water had changed in quality after transport.

In addition, looking at vocabulary alone is, I believe, an insufficient argument in order to judge *Ancien Régime* sensory descriptions as imprecise and unscientific. The main terms were constantly amended and nuanced through the widespread use of qualifiers, images, metaphors, and addendums. That's why a water would be described as both "*lightly styptic*" and causing "as-triction" for example. Even if those two terms had similar meanings, the combination helped to bridge the gap that vocabulary could not fill. The subtlety of the sensory experience necessitated this kind of attention.

Most importantly, it is entirely clear that the analysts themselves did not struggle as much as one might expect with the alleged subjectivity, and fickle nature of the senses. Although it did come up at times, it was rarely seen as a paradigm-ending catastrophe that should signal the immediate demise of the

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<sup>1157</sup> The corpus on which I based this reading spans across a coherent time period, the eighteenth century, and its limit to French-language documents allows to make this linguistic point. I am not pulling documents from many centuries of history or vastly different language cultures which could bring artificial diversity to the set through translation choices.

analysis by the senses. Analysts were aware of the senses' individual nature, but they found ways to bridge the differences in experiences. They used a precise and accessible vocabulary and made comparisons to chemical products that could be referenced by any other analyst. On many occasions, they even asked others about their impressions of a water in order to assess whether their experiences were typical or not. Despite much scepticism from contemporary philosophers on the nature of the sensory experience, such issues did not plague the practice of chemical analysis, and that is why it remained an essential tool for any analyst worth his salt.

If Shapin's point on the poverty of eighteenth-century sensory vocabulary can be proven wrong in this case, what of his broader argument? Did the sensory, which he and others argued had less and less bearing on the nature of matter, vacate the laboratories of water analysts came the end of the century? Again, the case of mineral waters tends to show otherwise, as the sensory appraisal of mineral waters endured well into the nineteenth century, especially as some mineral waters shifted towards the world of drinks, and the sensory experience of drinking them became if anything, even more crucial.

## Conclusion

This chapter brings into focus the very first step of chemical analysis, the sensory analysis, and expands on this seemingly innocuous part of the protocol in order to make several points. The first is that throughout the eighteenth century, mineral waters have evaded definitive classifications. Most strict definitions inadvertently excluded some mineral springs with their proposed criteria. This led to a dynamic in which most practitioners reverted to the sensory as a simple and intuitive way as defining a mineral water. A water was mineral when it 'felt' mineral.

A point of this chapter is to study the effects of medical discourse on the senses in the sensory appraisal of mineral waters. The world of physicians had been shaken by some controversies, particularly in the seventeenth century, especially on the question of senses. Some argued for the usefulness of the sensory to be closer to ancient sources, others argued otherwise. This chapter shows that, though remnants of this debate were present in analytical reports, none of the analysts adopted the hard anti-sensory posture.

This is proven by the analysts' own discourse, but it can be shown even more simply, with an empirical study of the inclusion of the sensory in analysis reports. Despite any discourse on the senses that might have taken place in medicine, physics, philosophy or any other fields, the sensory analysis was performed by the vast majority of water analysts.

After making this initial point, my approach became empirical, and consisted in noting and classifying the vocabulary used in sensory analysis. This provides a broad survey of the textual sensory descriptions in the eighteenth century. The full lists are available for future research, and to my knowledge,

such a wide sample of this vocabulary has never been presented in prior scholarship.

This vocabulary shows that taste was the most important component of sensory analysis. It was the most frequently included and described with a lot of care. The vocabulary used to describe taste was varied, precise, and the analysts attempted to bridge any remaining uncertainty with the use of comparisons to drinks or chemical products in order to make their impressions as communicative as possible. The three other components of the sensory analysis, the visual description, the appraisal of smell and the textural impressions, were often included too, but less so than taste. Each of these categories was only described when something was noteworthy. An oily and soft water for example never failed to get a mention. The same can be said of a water with a noticeable hue, or which smelled very strongly of sulphur for example.

The final point that this chapter attempts to make is historiographical in nature. A strand of scholarship, particularly in the history of chemistry but also in the history of science in general, argues that the sensory was imprecise, and considered as lesser by the *savants* of the late eighteenth century. This disregard has been argued to lead to their progressive abandon from scientific practice. I argue against this narrative. My case is not at all ambiguous on that point. At the very least, for the case of mineral water analysis, the senses were clearly used, and sensory analysis was highly recommended by all authorities in the field. This widespread endorsement happened because the senses were believed to be an essential item of redundancy. In addition, though the senses could occasionally be deceived, these cases were quite rare and easily avoided by taking some precautions, such as asking for a second opinion. The vocabulary used to describe the senses was precise, shared and perfectly able to communicate impressions from one analyst to the next. Since the mineral waters were consumable products, the precision used in describing the sensory experience that waters impacted on the body was also aimed at the patients who would later drink them.

Because the sensory remained so paramount in defining what a mineral water was, and as an indication of its contents, “the examination of the eyes, the nose and the tongue”, remained a highly important first step in any water analysis.<sup>1158</sup>

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<sup>1158</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL. “l'examen des yeux, du nez et de la langue”.

## Chapter 8. Chemical analysis

Mineral waters were notoriously difficult products to understand, and any claim made about them therefore faced an uphill battle in its path to credibility. A way of strengthening the assertions was therefore to multiply the experiments, in order to reach reliable results through convergence. This dynamic was at the heart of the process of chemical analysis in the eighteenth century. The previous chapter already touched on the importance of redundancy, by focusing on the first step of the process and its role in informing the rest of the experiments and catching potential errors. The current chapter will continue this exploration by examining the subsequent steps of the analysis. I aim to show how a combination of different chemical processes into a standardised protocol became the principal method of constructing facts about mineral waters.

Analytical chemistry, as it is known today, is an entire subset of the chemical discipline. It earned its status as a branch of chemistry during the twentieth century, in large part due to the introduction of spectroscopy.<sup>1159</sup> But before it became a sub-discipline of its own, chemical analysis was simply a method in the toolkit of chemists. The objective of chemical analysis was to discover the physical properties and chemical composition of a substance. It could be applied to a variety of different products, from plants to minerals to antidotes.<sup>1160</sup> When applied to mineral waters, the guiding principle was the same. The analyst of a water attempted to accurately describe the physical properties of a water and its chemical composition. Though there were evolutions in what the expected results exactly entailed, the necessity of being able to name each mineral contained in the water by the end of the analysis was key throughout the entire period.

The idea of combining different laboratory methods to give a complete picture of a product was not born in the eighteenth century. The broad strokes for

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<sup>1159</sup> The main instrument which drove analytical chemistry was the introduction of spectroscopy. Nicholas C. Thomas, "The early history of spectroscopy," *Journal of Chemical Education* 68, no. 8 (1991). On a general history of analytical chemistry, see: MI Karayannis and CE Efstathiou, "Significant steps in the evolution of analytical chemistry," *Talanta* 102, no. 7 (2012).

<sup>1160</sup> On the analysis of materials from the plant kingdom in the eighteenth century, see: Jonathan Simon, "Analysis and the hierarchy of nature in eighteenth-century chemistry," *Br J Hist Sci.* 35, 1 (2002). For an example of chemical analysis in the domain of secret remedies, see: Maurice Bouvet, "Un remède secret du XVIIIe siècle : le rob Boyveau-Laffecteur," *Bulletin de la Société d'histoire de la pharmacie* 11, n°39 (1923).

what constituted an analysis originated decades if not centuries before the period of interest here. Some techniques, like distillation for example, were staples of medieval alchemy.<sup>1161</sup> The history of analytical chemistry did not however follow a linear trajectory, one in which methods simply became more precise and more efficient over time. The method oscillated between innovation and return to older techniques, with a near constant adjusting of the number of included steps. The purpose of this chapter is therefore not to limit the discussion to what made eighteenth-century analyses ‘good’ or ‘bad’. I will instead discuss the steps which were included in analyses, by both influential *savants* and hitherto unknown analysts, and how these steps changed and evolved over the century. Upon examining these steps, the more pertinent question that I want to answer is how the method of analysis was refined so as to present a picture of mineral waters that other analysts could agree on.

Previous chapters have demonstrated the endurance of the chemical standard within general understandings of mineral waters. They also showed that chemistry became a well-known and respected field of expertise within the world of waters. This trust was not accidental, and it all started within the process of analysis itself. But analysis was no straightforward endeavour. The analysts had to adopt a complex proprietary set of methods, theories, and language in order to communicate within their own network. For this reason, this group can, I believe, be qualified as an ‘esoteric circle’.<sup>1162</sup> Inside of that esoteric circle of analysts, there were plenty of doubts, errors, and incomprehensible observations to contend with.

It has been argued that there are strictly speaking no ‘hard sciences’, because no scientific activity is ever fully devoid of ‘softness’.<sup>1163</sup> For eighteenth-century analytical chemistry, part of this softness was due to the pressure exerted by the market onto the analysts, demanding that they produce reliable results. In addition, the social dynamics of institutions, the incentives of the medical field, the habitus of the intellectual elites of the Enlightenment undoubtedly played a role in shaping the production of knowledge.<sup>1164</sup> But this

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<sup>1161</sup> Frederic L. Holmes and Trevor H. Levere, eds., *Instruments and Experimentation in the History of Chemistry* (Cambridge: MIT Press, 2000).

<sup>1162</sup> See chapter 6, on the network of analysts as an esoteric circle. See also: Fleck, *Genèse et développement d'un fait scientifique*, 184, 171.

<sup>1163</sup> Here, I am referring particularly to the constructivist approach to science. Overall, this field has argued that there is no such thing as a ‘pure’ scientific endeavour. Knowledge does not begin as pure to be later tainted by economic interests or individual mistakes. Rather, all facts come from a consensus between actors of unequal voting power. Foundational texts in the field include: Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Harvard University Press, 1987); Pinch and Bijker, “The social construction of facts and artefacts: or how the sociology of science and the sociology of technology might benefit each other.”; Fleck, *Genèse et développement d'un fait scientifique*. For a more recent overview of the field, see: Felt et al., *The Handbook of Science and Technology Studies, Fourth Edition*.

<sup>1164</sup> On social approaches to science and knowledge construction in the enlightenment, see: Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton University Press, 2011); Ken Alder, “French Engineers Become Professionals, Or, How Meritocracy Made Knowledge Objective,” in *The Sciences in*

softness also came from within the field itself. Chemical theories were lacking when it came to explaining certain phenomena, the material conditions of the analysis could cause inaccuracies, and the waters themselves remained stubbornly difficult to fully decompose into constituent parts. This shaped chemical analysis and pushed analysts to increase reliability. They did this by refining each aspect of the analysis to eliminate as many sources of error as possible. As analyses were made by dozens of individuals without a common education, these changes to the method also had to circulate, to be shared with others and to reach a form of consensus.<sup>1165</sup>

I will argue that the method of chemical analysis was standardised during the eighteenth century. In order to make this claim, I will rely on a large sample of chemical analyses by once again making use of the database which was built for this project. The collection of ninety-three reports allows for a detailed breakdown of the steps of analysis, and one that differentiates between frequent procedures and eccentric ones. A close look at this analytical protocol reveals the precise manner in which the scientific gaze was applied to the waters, while also connecting to the wider history of chemistry, by bringing to light a decidedly under-studied aspect of the developments of chemistry in the eighteenth century.<sup>1166</sup>

I will begin this exploration with a short discussion of the overall difficulties that the analysts were presented with. Following this, I will propose a detailed exploration of each section of the analysis. This step-by-step description will not follow a single analyst's work. Rather, by compiling all of the reports, I have been able to parse the most commonly employed methods and have gathered them into a list of steps. I will discuss the unfolding of each of these steps, the materials required, how often it was done, and what it hoped to uncover. These different steps, which would constitute a theoretical 'complete' eighteenth-century analysis, are the description of the environment, the physical measurements, the air analysis, the use of reagents and the different methods of evaporation and crystal separation. A description of each procedure is necessary, as the difficulties in establishing facts about waters laid at the heart of the laboratory, in the small decisions that chemists had to make in the face of complex phenomena. I will then conclude this description with a discussion of some of the changes in chemistry towards the end of the century, and its repercussions on chemical analysis.

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*Enlightened Europe*, ed. William Clark, Jan Golinski, and Simon Schaffer (Chicago: University of Chicago Press, 1999).; Alder, "Making Things the Same: Representation, Tolerance and the End of the Ancien Regime in France."

<sup>1165</sup> See Chapter 6.

<sup>1166</sup> As discussed in chapter 1, there have been few publications on the subject of water analysis. Three noteworthy articles have been written on the subject, two set in England, and the third set in France and centring on the first half of the eighteenth century. Bycroft, "Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750."; Eddy, "The Sparkling Nectar of Spas; or, Mineral Water as a Medically Commodifiable Material in the Province, 1770–1805."; Coley, "Physicians and the chemical analysis of mineral waters in eighteenth-century England."

## The hardships of analysis

All analysts seemingly agreed that the chemical analysis of waters was a difficult task to take on. In Enlightenment rhetoric, this kind of argument was common. Authors of various scientific texts often started by an appeal to tolerance, and by presenting how humble they felt about their work and results, particularly when viewed in comparison to the vast unknown of nature, or the works of past great men of science.<sup>1167</sup> Variants on the metaphor of ‘standing on the shoulders of giants’ were a common way of communicating this humility.<sup>1168</sup>

While this was a common trope, and one with which practitioners engaged with in order to avoid accusations of hubris, there was a specificity to the challenges presented by chemical analysis. Essentially, while all scientific endeavours were complex, analysis was among the more obtuse. Méglin opened his report by stating: “All Chemists agree on the difficulty of analysing mineral waters.”<sup>1169</sup> Beltz started his by asserting: “The analysis of mineral Waters is one of the most delicate and at the same time most important works of chemistry.”<sup>1170</sup> Fourcroy reminisced at the end of his report on the “lengthy & arduous” analytical task he had conducted.<sup>1171</sup> The lexicon of difficulty and effort was present throughout the reports. One of the later analyses in my corpus, written in 1809, lamented: “nothing is more difficult than making a mineral water analysis with the rigorous exactitude that is always required when dealing with less complex [*composés*] bodies. this is also why we have so few good mineral water analyses.”<sup>1172</sup>

The analyst Antoine Augustin Parmentier (1737–1813) was particularly long-winded on the subject. He wrote an entire memoir titled *Observations on the difficulty of proceeding well in the analysis of mineral Waters*, which he

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<sup>1167</sup> See Chapter 1.

<sup>1168</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, ii. “loix incontestables”; “en ajoutant aux lumières de ceux qui nous ont précédés les siennes propres, on parvient enfin à des connoissances plus étenduës & plus certaines.”

<sup>1169</sup> Méglin, “Analyse des eaux minérales de Sultzmat en Haute Alsace.”, 1. “Tous les Chimistes s'accordent sur la difficulté d'analyser les eaux minérales.” This was the very first sentence of the book. He then went on to pursue this rhetorical trope by stating “Si les plus instruits parmi eux ont sçu appercevoir, combien il étoit délicat & pénible de se livrer à ce genre d'opérations, que ne devrois-je pas craindre en voulant pénétrer dans cet immense labyrinthe, pour y découvrir les secrêts les plus cachés de la nature ?”

<sup>1170</sup> The quote on the difficulty on chemical analysis was the very first sentence of the report. Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM. “L'analyse des Eaux minerales est un des travaux les plus delicats et en meme temps les plus importants de la chymie.”

<sup>1171</sup> Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 311. Recherches “longues & pénibles”.

<sup>1172</sup> Report by Deyeux on a letter by Chancel on the analysis of the waters of Monestier, (1809), AJ/16/6697, n°753, AN. “rien n'est plus difficile que de faire une analyse d'eau minerale avec cette exactitude rigoureuse qu'on exige toujours lorsqu'il sagit de corps moins composés. c'est aussi pour cela qu'on a si peu de bonnes analyses d'eaux minerales”.

presented at the Academy of Lyon in 1773.<sup>1173</sup> The memoir started by emphatically claiming: “Although there are no objects which managed to have deserved the attention of Chemists and naturalists more than Mineral Waters, we must convene however that the Examination [chemists] have made of them have long only served only to fill our Spirit with incertitudes and false ideas on their nature and their properties.”<sup>1174</sup> He recalled the inefficient techniques of the ancients, and their habit of judging the waters only by sensory impressions. He added though, that by trying to correct the few errors induced by the senses, the analysts only created hundreds more, some of which had only been solved very recently.<sup>1175</sup> Chemistry, he claimed, had made great progress of late, but not enough to uncover the mystery of mineral waters.

The memoir then highlighted the main issues encountered which each step of the analysis, arguing that none was immune to error. First, not all chemists could travel to the spring, and the waters were often poorly transported, which led to inconsistencies in the analytical results. This was a well-recognised fact in the science of mineral waters. Analysts had means of lengthening the stability of a water, such as using tar-sealed glass bottles, but none of these techniques were believed to be faultless.<sup>1176</sup>

According to the memoir, the second source of error was that no two analysts employed the exact same method, and that personal “preoccupation”, even when unintended, got in the way of good laboratory practice. This complicated the already “delicate and thorny” procedure of analysis.<sup>1177</sup> This issue was less often brought up, but it was implicitly the problem that analytical protocols were trying to solve. That being said, these protocols also stressed the importance of the analyst using his own intuition when selecting the experiments that had to be performed, suggesting that simply making identical copies of the method was not always a safe approach.<sup>1178</sup>

Parmentier then listed the issues found with the different steps of analysis. The senses could be fooled, the physical measurements could be flawed by imprecise instruments. He found the scale better than the use of the “liquor-weigher”, but even a scale was only as good as the reference used for the

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<sup>1173</sup> Antoine Augustin Parmentier, “Observations sur la difficulté de bien proceder a l'analyse des Eaux minerales”, (1773), Ms pa 206, f38-f49, AAL.

<sup>1174</sup> Ibid, “Quoiqu'il n'y ait pas d'objets qui parvinssent avoir plus merité l'attention des Chymistes et des naturalistes que les Eaux Minerales, il faut cependant convenir que l'Examen qu'ils en ont fait n'a servi pendant longtems qu'a remplir notre Esprit d'incertitudes et didées fausses sur leur nature et leur propriete.”

<sup>1175</sup> Ibid, “On a detruit heureusement depuis peu ces Erreurs, on a abandonné l'ancien division des Eaux pour les classer conformement aux principes qui les constituent et nos analyses sont devenues, plus exactes, plus claires et plus methodiques.”

<sup>1176</sup> See chapter 2.

<sup>1177</sup> Antoine Augustin Parmentier, “Observations sur la difficulté de bien proceder a l'analyse des Eaux minerales”, (1773), Ms pa 206, f38-f49, AAL. “la préoccupation souvent dans laquelle on est malgré soy”. “epineux et delicat”.

<sup>1178</sup> See chapter 4, and: “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, xx.

weight. The reagents were often impure and their reactions hard to interpret accurately. The oak gall tincture, which was the most widely used reagent in the period, often gave false negatives. Some reagents were completely useless in his opinion, as he exclaimed: “How many examples we have of infidelities of analyses made by the reagents alone!”<sup>1179</sup> He pointed out reagents which were known to turn even in the presence of distilled water, which by nature should not react with anything except a test of water. The reagents were one of the more controversial steps of the water analysis, as will be explored further in this chapter, and this memoir, by highlighting their errors, reflected the state of discourse on analysis of his decade.

Parmentier concluded his gloomy memoir by talking about the importance of the evaporation, although that method was in his opinion, also far from having reached perfect reliability. He talked of the near impossibility of trying to keep the volatile spirits inside of the waters, and the difficulty in identifying the crystals in the residue. Deliquescent salts in particular presented identification problems that were “almost insurmountable”.<sup>1180</sup> This latter issue was also underlined by other analysts, who collectively agreed that few things were as difficult as differentiating several different salts which were all bound together in a sample of a few *grains*.<sup>1181</sup>

The writing of this discouraging memoir, and the consistency with which the hardships of analysis were brought up shows an effort that went beyond a simple nod to humility. The specific areas of ‘softness’ outlined by the memoir, echoing many complaints found scattered throughout other works on mineral waters, suggests that those difficulties were not only an expression of scientific doubt. They reflected the genuine insecurities shared by analysts who were faced with the demand of producing accurate results, which could in turn spell either fortune or disaster for certain mineral water owners. Their findings were also used as guides in the prescription of mineral waters, thus adding in some cases a public health pressure on their shoulders.

This heavily incentivised analysts to, firstly, be as clear as they could regarding the uncertainty of their results. If they harboured any genuine doubt regarding one conclusion, it was in their interest to call for help or flag the doubtful claim, so as to avoid retributions down the line. Secondly, it incentivised them to multiply the checks during the process, to only present results that were vetted to the best of their abilities. If they were to be proven wrong, they would be more defensible if they could show that they had done all they could to obtain an accurate result.

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<sup>1179</sup> Ibid, “Combien n'avons nous pas d'exemples de l'infidélité des analyses faites par les seuls reactifs !”

<sup>1180</sup> Ibid, “presque insurmontable”.

<sup>1181</sup> Bergman, “Physical and Chemical Essays.”, 112–114.

## Interpreting laboratory methods through written reports

Brockliss, in his article on seventeenth-century French mineral waters, claims the following: “Because of the deficiencies in contemporary chemical analysis, no one knew exactly the mineral composition of the waters being promoted. Guesses might be made from their taste or smell, but essentially their composition was known from their effects.”<sup>1182</sup> While I would argue that he is not wrong about the importance of taste and smell, his view of chemical analysis appears reductive, even for the seventeenth century. In a 1648 treatise on the discovery of the waters of Vic-sur-Cère, the author made use analytical methods in order to assess the potential of the waters. He first described that eight or ten years ago, a fountain which was “clear, diaphanous, cold, stingy, sourish, and of a slightly unfortunate taste” had been noticed by the locals.<sup>1183</sup> The authors added that he knew of two methods for the appraisal of waters, the sensory and the examination of the residue.<sup>1184</sup> He made use of both techniques, in order to better support his claim, and estimated that the waters were “calchanteuses” and the residue was made of pure vitriol.

This example shows that chemical analysis, and the idea of converging different observations as a way of obtaining more precise knowledge about a water’s contents existed as early as the seventeenth century. In the following period, analysis became more common, and with this influx of practitioners came a renewal in the practices themselves.

The description of the steps of analysis that will follow are based on analytical reports. An advantage of having a corpus that contains both printed works and manuscripts is that different types of censorship applied to them. Printed works were vetted carefully and would therefore not include sensitive information.<sup>1185</sup> Manuscripts, although not subject to official censorship, were also edited, but a little less attentively. Before discussing the contents of the reports, I want to first highlight a few passages that show how these kinds of documents were written, what information was included, and what was left out.

An informative document in this regard was the 1819 commentary by Laprade the son of his father’s old analysis of the waters of Ambert. The son presented his father’s work to the Academy in Lyon, and the resulting discussions was summarised in the minutes. The son explained that he had access to

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<sup>1182</sup> Brockliss, “The Development of the Spa in Seventeenth-Century France.”, 41.

<sup>1183</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “on Decouvrit il y a huit ou dix ans vers le milieu de la colline appelée Sauveroque, une fontaine claire, diaphane, froide, piquante, aigrette, et d'un gout un peu facheux”.

<sup>1184</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. “il y a deux moyens pour connoitre les mineraux contenus dans une eau minerale, sçavoir le tact, le gout, la vüe et l'odeur, & la corruption et la dissolution de l'eau. a ces deux moyens on peut ajouter la circonspection des lieux voisins”.

<sup>1185</sup> Robert Darnton, *Censors at Work, How States Shaped Literature* (New York, London: W. W. Norton, 2014).

his father's work notes, as opposed to the finished, published report.<sup>1186</sup> This provides a rare look at the drafts of an analysis, which can be compared to the finished product. Some sentences that were quoted from the draft notes were *verbatim* the same as in the finished report. Other parts however, such as the interpretation of the results, was missing entirely. A tirade about the uselessness of certain reagents which was found in the father's finished work was also not included in the original notes. This suggests that while performing the analysis, some analysts noted the proceedings and results of the experiments as they were happening, with a lot of precision and even some attention to phrasing. The interpretation of the results however was done at a later stage, alongside personal opinions and theories.<sup>1187</sup>

Other analyses gave indications regarding what was not included. Dufau explained in his 1776 analysis that he only included some of the reagents that he had used in the report. He feared that listing every single reagent that had showed no reaction would be tedious and unnecessary to the final report.<sup>1188</sup>

Two other analysts made comments of that nature. Cuel alluded to a few additional experiments that he completed, but assured that relating their results would be pointless.<sup>1189</sup> Tingry explained that it would be superfluous to relate every single detail and precaution employed in the analysis, and that all the needed to say was that he could hardly have been more thorough.<sup>1190</sup> This particular comment might have been made to disguise a great number of things, as it is difficult to gauge its sincerity. Perhaps Tingry simply wanted to appear informed of the complexities of analysis.

These types of allusion suggest that generally, analysts prioritised the descriptions of the experiments that supported the claims they were making. When they conducted experiments that led nowhere, failed, or gave contradictory results, they did not always relate them in detail. This dynamic was especially present regarding the reagents. Often, only the reagents that showed positive results were mentioned, and the others were just alluded to in generic terms, such as "the acids", or were outright not mentioned.<sup>1191</sup>

In general, the reports were written in chronological order. They related whichever experiments were performed first, and then proceeded in order. This was probably done because the analysts took notes during the operations

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<sup>1186</sup> There are not many analysts whose work notes have been kept in the archives. In addition, I have not focused my archive strategy towards the collection of personal documents, hence the rarity of work notes and drafts in the primary material used here. In consequence, the discussion of the process of analysis is largely based on completed reports.

<sup>1187</sup> Minutes of the Academy of Lyon, on the analysis of the waters of Auch by Laprade the father, read and commented by Laprade the son, (1819), Ms 219 f294–297, AAL.

<sup>1188</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM.

<sup>1189</sup> Analysis of the waters of Saint Nectaire by Cuel, (1782), SRM 92B, dossier 43, ASRM.

<sup>1190</sup> Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN.

<sup>1191</sup> This is the kind of issue that is reduced by looking at a large number of analyses, making it more likely that most important experimental techniques would be mentioned at least once, through simple probability.

and based the final report on those work notes. There is only one counterexample of this habit in the corpus, suggesting that chronological descriptions were the norm.<sup>1192</sup> I have therefore organised the following sections in the order that they were most often included in analysis reports. Though few analyses included every single one of these steps, they constituted the pool of methods from which each analyst could pull in order to put together his experimental plan.

## Describing the spring's environment

Before proceeding with the experiments, most analysts chose to introduce the water of their study with a description of its environment. It could be debated whether this description belongs to the analysis itself or if it was merely a preliminary to it. It was included 72% of the time in the corpus. This description usually served one of two purposes, either to give a general introduction to the town, its people and the local landscape, or to pre-empt the analysis by giving tentative indications of what could later be found in the water.

In the first case, these kinds of observations painted a picture of the surrounding area and gave the reader an idea of what it was like to visit. In the visual description, analysts described the local geography, indicated proximity to a particular city, a mountain range or another mineral spring. This part sometimes included comments of naturalistic interest, such as the nature of the earth, or the type of rocks and vegetation of the surroundings. Occasionally, this could also extend to a description of the people who lived near the spring. If the locality counted large numbers of elders, or simply healthy-looking residents, they could warrant a mention.

The analysis of the waters of Bugey, mentioned in an earlier chapter for its rather odd focus on the women of the town, fell in that category. It described the lush landscape, the quality of the locally grown produce, and of course, the good character, manners and beauty of the inhabitants.<sup>1193</sup> The level of whimsy reached in the Bugey analysis was unmatched, but many other analysts included tamer versions of these descriptions. The analysis of Noyers by Gastellier was much more typical in its environmental introduction. It opened by situating the spring on a map, saying: "The Town of Noyers is half a mile and 3 quarters from Lorris, five miles west of montargis, it is situated between two hills, one on the east and the other on the west: at the bottom of the former is a mineral fountain which is the subject of this memoir."<sup>1194</sup> Before

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<sup>1192</sup> Lanoix's analysis stands out by being organised by product instead of chronologically. It also included the reagents after the results of the evaporation, which was unusual. Analysis of the waters of Orliénas by Lanoix, (1778), Ms 120, f203–206, AAL.

<sup>1193</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL.

<sup>1194</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. "Le Bourg de Noyers à une demi lieue n 3 1/4 de Lorris, cinq lieues ouest de montargis, est situé

describing the spring itself, Gastellier gave more details about the region, such as the types of grain grown in the area, and its local forestry.

This kind of precision was expected of many reports. The analysis of Saint Alban described the idyllic surroundings, the beauty of the mountains, the quality of the air and of the other waters.<sup>1195</sup> On the flip side, the analyst of the waters of Segray described an ugly region and a spring which was found in an unsightly landscape.<sup>1196</sup> Sometimes, this section included historical details. The buildings around the waters of Bourbonne included a roman inscription, which the analyst used as proof of their use throughout antiquity.<sup>1197</sup> This was a way of cementing the long history of their usage, and strengthening their reputation. The analysis of Sultzbach similarly included a few paragraphs on the history of the spring, explaining that their ancient use had endured into the medieval period, only to be forgotten in the sixteenth century.<sup>1198</sup>

These descriptions of the surroundings could have practical purposes regarding future visits to the spring. Naming the nearest towns could help a potential reader in arranging transportation. The glowing pictures of the landscape also clearly served advertising purpose. One report made these observations specifically in order to determine whether a bathing establishment could be built in the region.<sup>1199</sup>

The environmental descriptions served a second purpose, which was to provide details that might help in explaining certain results. Gastellier wrote about the waters of Noyers. Upon finishing the description of local crops and forests, he discussed the composition of the soil. This was done with some precision, as he explained: “sand forms the exterior crust of the earth, six inches under this layer is a mix of clay sand and martial chalk. the ploughmen often encounter iron ore the size of the fist, under the ploughshare.”<sup>1200</sup> It is not difficult to imagine how such an observation might be helpful in supporting the claim that the waters were ferruginous, if the earth around the spring readily produced iron ore. Gastellier’s work on the environmental description also

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entre deux collines, l'une à l'est et l'autre à l'ouest : en bas de cellecy se trouve un fontaine minerale qui fait le sujet de ce memoire.”

<sup>1195</sup> Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

<sup>1196</sup> Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM.

<sup>1197</sup> The author decided that deciphering the meanings of this inscription was outside of the topic of analysis, and therefore did not include further comments on it. Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages.”, Description.

<sup>1198</sup> Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

<sup>1199</sup> The waters in question were found at the bottom of a deep valley, and he feared that this would make transport to the waters difficult, while remaining hopeful that some earthwork might take care of the problem. Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN.

<sup>1200</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “le sable forme la croute eterieure de la terre, à six pouces dessous cette couche s'en trouve une argileuse mêlée de sable et de craye martiale. les laboureurs rencontrent souvent sous le soc de la charue, de la mine de ger de la grosseur du poing.”

extended to the local river, of which he performed a succinct analysis, in order to gauge its differences with the mineral spring.

Some analysts pushed geological inquiries further and used the report to argue for the origins of mineral waters in general. Cuel wanted to explain why the Auvergne region appeared to be so full of many mineral springs. To him, the explanation lay in the volcanic nature of the soil, and the kind of rocks that could be dissolved by hot waters.<sup>1201</sup>

A thorough inspection of the fountain itself and the quality of its construction, as well as all the apparatus used to channel the waters, were equally important descriptions included in this category. The analyst of the waters of Verdusan indicated for example that “The Mineral waters of Verdusan consist in two fountains perfectly Built in beautiful masonry”.<sup>1202</sup> These initial considerations served as an important piece of context, since the bad state of the tap could explain the presence of impurities in the water or the dilution of the spring by undesirable rainwaters. If the fountain was open to the elements, the water could be expected to change in properties during rainfall. Alternatively, the residue could be contaminated by dust, leaves and other kinds of organic matter that made its way into the fountain.

The environmental descriptions sometimes featured the presence of animals, in and around the springs. These mentions fell into a few different categories. Three analyses of my corpus included stories of animals discovering new springs. The waters of Vic-sur-Cère were said to have been discovered by cows, which despite the vigilance of their shepherds, kept escaping to go drink the waters.<sup>1203</sup> In 1777, a similar story was told about the waters of Quercy. The shepherd noticed that his cattle went to the waters by themselves and were purged by them. He shared his observation with the local physician, who failed to notice the importance of such a phenomenon. The waters would have never been popularised if it had not been for the interest of another physician who heard of the story and decided to investigate further.<sup>1204</sup>

These stories highlighted the value of the animal judgement in finding good mineral springs, as they were seen as the ultimate disinterested party. A third story of this kind made that explicit. The waters of Saint Suliac were said to have been discovered by a herd of cows and sheep: “The Shepherds themselves moved by thirst or curiosity, wanted to taste the drink of their beasts

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<sup>1201</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “Les eaux minerales sont un composé de plusieurs substances dont l'union avec l'eau produit des combinaisons sans nombre, leau etant un des plus grands dissolvans qui existe dans la nature, il est vraisemblable que coulant dans des terrains remplis de matieres gypseuses, séleniteuses, dont elle est le dissolvant, nen dissolue effectivement une certaine quantité et ne sen sature jusque a un certain point a la faveur du gas mephitique.”

<sup>1202</sup> Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM. “Les eaux Mineralles de Verdusan consistent en deux fontaines parfaitement Baties en belle maçonnerie”.

<sup>1203</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

<sup>1204</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

which had been guided by instinct alone;”.<sup>1205</sup> Instinct was used to emphasise the objective good quality of the waters. In other instances, goats were said to love the salt of the waters of Bourbonne more than any other salt.<sup>1206</sup> Laprade also described how cattle travelled great distances of their own accord to come and drink the waters of Sail-sous-Couzan.<sup>1207</sup>

More often than discoveries, it was in death that animals revealed qualities of the waters. The same waters of Bourbonne were said to render the meat of pigeons that bathed in them more flavourful, which was also touted as a sign of the waters’ quality.<sup>1208</sup> Some springs were unsuitable for the survival of animals. Four different analyses mentioned that amphibian animals, from frogs to fish to crayfish could not live in the fountains where the mineral water sprung.<sup>1209</sup> In the case of Saint Alban, both analysts suggested that the gas was responsible for killing all life in the waters, but suggested that fish could survive in this water if the air had been shaken out of it.<sup>1210</sup>

A few rarer cases described animals being cured by the waters. When human testimonies were not available, analysts occasionally mentioned animal remedies. The waters of Saint Martin were said to have cured a horse for example.<sup>1211</sup> The waters of Donzy were also said to have cured a horse, as well as two hunting dogs.<sup>1212</sup>

Animals were also just a part of the environment of waters. The analysis of Pouillon complained about the “repulsive spectacle” of animals that were allowed to bathe and drink at the spring.<sup>1213</sup> The same analysis of Donzy also mentioned the disgust that might be felt by drinkers, who had to bear the view of “reptiles like grass-snakes, toads, frogs and other insects which swarm the

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<sup>1205</sup> Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM. “Les Pâtes eux même poussés par la soif ou la curiosité, vouleurent gouter a la boisson de leurs bestiaux que l’instinct seul leur avait fait découvrir ; ceux cy la trouvant meilleure que les eaux qu’ils avaient bû jusqu’alors continuèrent de s’y désaltérer et commencèrent à la vanter et a la préconiser.”

<sup>1206</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages.”, 11.

<sup>1207</sup> Analysis of the waters of Sail sous Couzan by Laprade, (1775), Ms 120, f279–280, AAL.

<sup>1208</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages.”, 40.

<sup>1209</sup> The water of Bussang was said to kill crayfish. Lemaire, “Essai analitique sur les eaux de Bussang.”, 54. “Une écrevisse n’y vit pas plus de quatorze minutes”; Similarly, the water of Sultzmatt was said to kill fish. Méglin, “Analyse des eaux minérales de Sultzmatt en Haute Alsace.”, 10. “les poissons ne peuvent y séjourner, ils y périssent”.

<sup>1210</sup> Analysis of the waters of Saint Alban by Laprade, earliest (1772), Ms 120, f254–257, AAL.; The waters of Saint Alban were also said to kill fish because of their air they contained. See: Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

<sup>1211</sup> Analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM.

<sup>1212</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM.

<sup>1213</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM. “Spectacle repoussant”.

reservoir”, which he argued should at least indicate that the waters contained “nothing pernicious”.<sup>1214</sup>

In that sense, the bodies of animals were seen as an analytical tool. Whether they lived or died in the waters, whether they liked the taste of them, or sought them beyond all human control, the animals were seen as a force which, outside of all interest or manipulation, could indicate that the mineral waters were indeed unique in their composition and properties. This is likely why such encounters were often mentioned in the environmental descriptions of the analyses.

The environmental description was the step which bridged the introduction and the chemical analysis per se. Sometimes, it was done in the interest of informing future results. Other times, it had a more literary or sometimes commercial purpose. It served as a way of satisfying the reader’s curiosity regarding the location of the spring. But like many of the other steps in the analysis, it was rarely omitted, lest the analyst be thought of as lacking in zeal.

## Measuring temperature, weight, and physical properties

### *Measuring temperature at the spring*

The most basic distinction between types of mineral waters was to differentiate between the cold waters meant for drinking, and the warm and hot waters, used in baths and showers. Although this distinction did not apply consistently, as practices around the waters diversified, the natural temperature of the waters was still considered to be important. Most analyses included, when possible, a precise measurement of the temperature of the spring. This obviously had to be done in person and directly at the fountain, as the heat never remained in transport.

Analysts typically used a thermometer marked with the gradation of Réaumur, from the time of its introduction in 1732.<sup>1215</sup> This thermometer indicated the freezing point of water as 0, and the ebullition of water as 80. This gradation was the most typical for chemists of the eighteenth century, until the enforcement of the Celsius scale in 1794.<sup>1216</sup>

The temperature measurements were not always done with the same level of scrutiny. One analyst discussed the temperature of the water, but without

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<sup>1214</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM. “cette eau a un gout fade, et dégoutant mais cependant supportable; elle seroit pour beaucoup de personnes, moins dégoutante par sa saveur que par l’aspect des reptiles comme couleuvres, crapauds, grenouilles et autres insectes dont fourmille ce reservoir, et qui dénotent du moins quelle ne contient rien de pernicieux.”

<sup>1215</sup> René Antoine Ferchault de Réaumur, “Explication des principes établis par M. de Reaumur, pour la construction des thermometres dont les degrés soient comparables,” (1732).

<sup>1216</sup> Claude Viel, “L’évolution du laboratoire et des instruments de chimie vue au travers des ouvrages à planches, du XVIIe à la fin de la première moitié du XIXe siècle,” *Revue d’histoire de la pharmacie* 96, n°363 (2009), 20.

using a thermometer. He simply compared the warmth of the different baths to atmospheric and corporal temperatures.<sup>1217</sup> Some analysts were careful to note the temperature at different points in the day or throughout the year. Laprade indicated that the waters of Saint Galmier changed temperature according to the season for example.<sup>1218</sup> In another analysis, he explained the colder temperature of the spring by the presence of iron in the water.<sup>1219</sup> In both examples, Laprade was trying to not only be descriptive but to also gain information about the water's composition via temperature. Tissier noted that the waters only varied by about a degree from day to day, thus suggesting that the waters were "sheltered from the vicissitudes of the atmosphere."<sup>1220</sup> Like Laprade, he used temperature as an indication of the composition of the spring. If it was "sheltered" from atmospheric changes, this meant that it was likely more stable.<sup>1221</sup>

Accidents and breakage were also a part of the temperature discussion. Gavinet made experiments specifically aimed at measuring how long the cold took to break a container of water. He compared different springs to see which one froze the quickest.<sup>1222</sup> This unusual – and expensive – test was not mentioned by any other analyst, for whom breakage was more of an unfortunate accident. Thermometers were particularly susceptible to shattering. Two analyses mentioned not being able to give a temperature measurement, because the thermometer that was meant to be used broke on the way to the spring.<sup>1223</sup> This was just one of the realities of having to travel to the spring to conduct chemical experiments.

In general, the precision used in the temperature measurements depended on the preference of the analysts. Paret for example, started by measuring the temperature of the waters of Donzy by simply immersing his hand in the water. But the next morning, fearing to be mistaken by a "false sensation of heat", he decided to make a series of temperature measurements using a thermometer

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<sup>1217</sup> Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

<sup>1218</sup> Analysis of the waters of Saint Galmier by Laprade, (1774), Ms 120, f282–283, AAL.

<sup>1219</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL.

<sup>1220</sup> Tissier noted the differences in temperature between the two streams of the spring. But since both only varied by about one degree depending on the day in the month, he concluded that they were unperturbed by the weather. Analysis of the water of Orliénas by Tissier, (1778), SRM 91A, dossier 2, ASRM. Les eaux "sont a l'abris des vissicitudes de l'atmosphère."

<sup>1221</sup> Another analyst made a similar comment, when he measured the temperature at different dates, and concluded that the melting of the snow had no effect on the waters, as this would have shown in temperature differences. This also meant that the waters were purely mineral, and not mixed with precipitation. Analysis of the waters of Monestier, (1775), SRM 90A, dossier 19, ASRM.

<sup>1222</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL.

<sup>1223</sup> Chifoliau estimated that the water was approximately the same temperature as the atmosphere, but could not be more precise because of the broken thermometer. Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM.; Dufour also explained that he meant to measure the temperature at the waters of Chaudes-Aigues, but that his thermometer broke on the way there. Correspondence from Dufour to the *Société*, (1783), SRM 90 A, dossier 23, ASRM.

at different times of the day, and in different weather conditions.<sup>1224</sup> Others simply took one measurement at the spring. These precise measures over several days or months could of course only be done by an analyst who lived near the spring. When they were only travelling to the spring for a day or two, the analysts sometimes included comments given by the locals, such as the fact that the water never froze in winter.

This variety of approaches probably came from the fact that temperature, although important, was not the most crucial component of the waters. It was often inconsistent, even at the spring, as the different baths had slightly different temperatures because of how much the water travelled through the plumbing. When the waters were too hot at the spring, patients were ordered not to bathe directly in the water. When waters sprung too hot, they were sometimes mixed with cooler common waters, as to avoid burning patients. Some hot waters were transported in bottles. In those cases, they were sometimes reheated to reproduce the original experience of drinking them at the spring, but this practice was criticised by physicians.<sup>1225</sup> Because temperature was such a changeable variable, it was useful for a spa town intendant to have a clear knowledge of the different temperatures of the baths, so that he might orient his patients to the spring with the most suitable warmth. It was however less important for an analyst to take all these details into account. Hence, only some of them gave thorough accounts of the water's temperature.

*The weight of the water: the precision of the areometer*

The second important measure that needed the help of instrumentation was the weight of the water, usually obtained either with an areometer, or a 'liquor weigher [*pèse-liqueur*]'. These instruments were both tubes of a precise mass, which – by how far they sunk into a water – indicated the weight of a mineral water relative to that of distilled water. The most common version of that instrument used throughout the corpus was the areometer developed by the apothecary Baumé.<sup>1226</sup> It was recommended that when comparing the weights of two different waters, the analyst had to make sure that the two liquids were at the same temperature to avoid potential errors.<sup>1227</sup>

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<sup>1224</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM. "une fausse sensation de chaleur".

<sup>1225</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM. "Aussi ne comprends-je pas, pourquoi l'on chauffe encore ces eaux, à qui la Nature a donné un degré de chaleur suffisant pour le bain, tandis qu'elles ont à l'endroit même où elles se vuident dans les Chaudières, un degré de Chaleur de plus, que selon Fahrenheit il ne leur faudroit effectivement."

<sup>1226</sup> Viel, "L'évolution du laboratoire et des instruments de chimie vue au travers des ouvrages à planches, du XVIIe à la fin de la première moitié du XIXe siècle.", 20.

<sup>1227</sup> See this exact problem being pointed out in a review of an analysis in: Report by Cornette and Coquereau on the analysis of the waters of Monestier, (1775), SRM 90A, dossier 19, ASRM.

As the weight of a mineral water was close to that of common water, the apparatus needed to be very sensitive. Fourcroy measured the weight of the waters of Enghien using his areometer and found: “their specific weight is to distilled water like 10006,8 is to 10000”.<sup>1228</sup> Méglin in his analysis regretted to have to use a less precise liquor-weigher, as he could not find an areometer anywhere near the spring. It is not entirely clear whether other analysts found liquor-weighers unreliable, as they were used consistently late into the century.<sup>1229</sup> The two different terms were sometimes also used interchangeably, and some analysts referred to the “liquor-weigher of M. Beaumé”, further confusing the two instruments.<sup>1230</sup>

There existed a great diversity of areometers in the eighteenth century, in part because they had numerous applications.<sup>1231</sup> The instrument was regularly tweaked, readapted and re-graduated by different chemists.<sup>1232</sup> But little of this diversity was on display in the water analyses, despite being one of the principal applications of the instrument. One analysis used the areometer of Brisson.<sup>1233</sup> Another used the areometer of Parcieux, after the Beaumé instrument proved too insensitive.<sup>1234</sup> According to the history of the areometer written by Bucquet, Parcieux’s instrument was the best available, as it combined sensitivity with easy readability.<sup>1235</sup> But despite this great quality, the Parcieux

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<sup>1228</sup> Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 42. “sa pesanteur spécifique est à celle de l'eau distillée comme 10006,8 est à 10000.”

<sup>1229</sup> See: Analysis of the waters of Prémieux by Maret, (between 1779 and 1787), SRM 91B, dossier 17, ASRM.; and Analysis of the waters of Tautavel by Carcassonne, (1783), SRM 93A, dossier 3, ASMR.

<sup>1230</sup> Jean Baptiste Lanoix, “Analyse des eaux minérales d'Orliénas,” (A Lyon, De l'Imprimerie d'Aimé de la Roche, aux Halles de la Grenette, 1780), 16. “Je plongeai le pese-liqueur de M. Beaumé dans un bocal cylindrique rempli d'Eau Minérale, la température de l'air étant de 20 degrés, il me donna 9 degrés, suivant sa division ;”.

<sup>1231</sup> The brewing industry incentivised attempts at elaborating suitably precise instruments, which led to a lot of cross-interests with chemical instrumentation development. See: James Sumner, “John Richardson, saccharometry and the pounds-per-barrel extract: the construction of a quantity,” *BJHS* 34 (2001).

<sup>1232</sup> The surviving collection of Lavoisier’s instruments at the Musée des Arts et Métiers showcases eight different areometers, of different sizes and designs.

<sup>1233</sup> Analysis of the waters of Roye by Lassone and Cadet, (earliest 1770), SRM 91B, dossier 32, ASRM.

<sup>1234</sup> “With the de Parcieux [areometer] M. Le Vieillard found a very notable [difference], which was, relatively to the weight of distilled water 2p. 71”. Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 15. “Nous avons trouvé que la différence de la pesanteur spécifique de cette eau avec celle de l'eau distillée, n'étoit point sensible à l'aréometre de M. Beaumé. Avec celui de M. de Parcieux M. le Vieillard en a trouvé une très-notable, qui a été, relativement à la pesanteur de l'eau distillée de 2p. 7l., & relativement à cele de l'eau de Seine de 2p. 9 lig. 1/2.”

<sup>1235</sup> Jean Baptiste Michel Bucquet, “Introduction à l'étude du règne minéral,” (Paris, Jean-Th. Herissant Père, 1771), 141. “L'instrument de M. de Parcieux réunissoit donc deux avantages essentiels, une grande sensibilité, & une échelle détachée de la queue de l'instrument. Il étoit si sensible en effet, que quelques grains de sel, jetés dans l'eau, suffisoient pour faire monter le plongeur de plusieurs pouces.”

instrument rarely featured in the works of most analysts who seem content with Beaumé's version.

Because the instrument was relatively simple, the measurement was very often performed, usually right after the temperature. When it could not be done, the analysts expressed some regret. One said for example that he was unable to measure the specific weight of the water because he was performing the entire analysis on pre-concentrated water that had been sent to him.<sup>1236</sup>

In rare cases, some analysts measured the atmospheric pressure at the spring.<sup>1237</sup> But most of the time, the thermometer and the areometer, represented the extent of the physical measures made during analysis. These two measures were presented in combination, and could give clues regarding the water's composition, but they were not nearly as indicative as, for example, the sensory analysis. This is likely why it was not performed nearly as often, as only 57% of the analyses included physical measurements.

Following those physical measurements, the analyst usually proceeded to the all-important sensory analysis, by describing the appearance, taste, smell and texture of the water. As this has been the focus of the previous chapter, I will not discuss this aspect of analysis here, and will instead turn to the following step, which was the study of the air.

## Integration of air chemistry to the analytical procedure

Many mineral waters contained airs, which is the eighteenth-century name of what we today would call gases. In some springs, the presence of airs was easily and intuitively identified. Bubbles could be seen forming at the bottom of a glass and slowly rising to the top, giving the recognisable sensation of sparkling waters. Some waters were, however, more obviously fizzy than others. Minute levels of aeration in a spring could be difficult to identify. Was the tingling sensation the water left in the mouth due to an air, or simply to one of the minerals? And if they were due to the presence of an air, what kind of air was it?

The period of heightened interest around air chemistry is most often associated with the late eighteenth century, and the debate which involved, among others, Lavoisier, Priestley, Scheele, Black and Cavendish.<sup>1238</sup> Those debates

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<sup>1236</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM.

<sup>1237</sup> Lanoix, "Analyse des eaux minérales d'Orliénas.", 15. "à 6 heures du matin le baromètre etan à 27 pouces 9 lignes".

<sup>1238</sup> On these chemists and their works in pneumatic chemistry, see: P. Balaram, "Oxygen, Lavoisier and Revolution," *Current Science* 83, no. 8 (2002).; Frederick Seitz, "Henry Cavendish: The Catalyst for the Chemical Revolution," *Notes and Records of the Royal Society of London* 59, no. 2 (2005).; Arthur Donovan, "Pneumatic Chemistry and Newtonian Natural Philosophy in the Eighteenth Century: William Cullen and Joseph Black," *Isis* 67, no. 2 (1976).; George Porter, "Joseph Priestley and his contemporaries," *The Journal of General Education* 27, no. 2 (1975). Other *savants* have been studied through their contributions to air chemistry,

included a number of questions around the nature of airs, their composition, the possibility of synthesising certain gases, and their general place within chemical systems.<sup>1239</sup> This period of emulation around airs was so intense, that even some contemporary chemists assumed and acted as though air chemistry was entirely an invention of the 1770s.<sup>1240</sup>

Boantza and Tomory's research contradicts this view, by retracing a history of the chemical understandings of aerated mineral waters in the late seventeenth and early eighteenth century. Their article highlights the works of several key figures in the field, such as Van Helmont, Becher, Hoffmann, Duclos, Brownrigg and Venel.<sup>1241</sup> In the case of Hoffmann, they show that his work was "of particular importance, since he argued that these spirits were the essential medicinal element of mineral waters. As he repeatedly revisited the subject from 1690 and onwards, Hoffmann attributed the curative powers of waters primarily to the "aether" and "spirits" they contained, in contrast to many of his predecessors and contemporaries, who identified metals, salts, and other minerals as the active ingredients in mineral waters."<sup>1242</sup> As Hoffmann was a common reference throughout the body of the reports, this conception of airs can be assumed to have been known to many water analysts.

In his later works, Hoffmann also associated the quantity of aether contained in a water with its remedial qualities: "Hoffmann referred to experimental results to prove his point about the presence of aether in waters. When stored in containers, mineral waters produced bubbles along the edges, and when shaken in a closed container, allowing for more aether to be disengaged, some waters became explosive. Conversely, when such waters were exposed to a vacuum produced by an air pump, a subtle elastic fluid left them."<sup>1243</sup> The

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for instance, Boerhaave in: Milton Kirker, "Herman Boerhaave and the Development of Pneumatic Chemistry," *Isis* 46, no. 1 (1955).

<sup>1239</sup> Leslie Tomory, "Gas lighting and pneumatic chemistry," in *Progressive Enlightenment: The Origins of the Gaslight Industry, 1780–1820*, ed. Leslie Tomory (MIT Press, 2012); E. L. Scott, "History of chemistry: Carl Scheele (1742–1786) and the discovery of oxygen," *Nature* 322, 305 (1986); John G. McEvoy, "Joseph Priestley, "Aerial Philosopher": Metaphysics and Methodology In Priestley's Chemical Thought, From 1762 to 1781," *Ambix* 25, no. 1 (1978); E. L. Scott, "The "Macbridean Doctrine" of Air: An Eighteenth-Century Explanation of Some Biochemical Processes, Including Photosynthesis," *Ambix* 17, no. 1 (1970); John Parascandola and Aaron J. Ihde, "History of the Pneumatic Trough," *Isis* 60, no. 3 (1969).

<sup>1240</sup> Older analyses were often dismissed for their failure to include a discussion of the air present in the water. See chapter 6.

<sup>1241</sup> The article also highlights the role of Boyle in understanding the way in which airs could be bound to waters, using the term "impregnated" for example, in order to refer to airs that seemed to "mingle" with the waters without being chemically bound to them. Victor D. Boantza and Leslie Tomory, "The "Subtle Aereal Spirit of Fountains": Mineral Waters and the History of Pneumatic Chemistry," *Early Science and Medicine* 21 (2016).

<sup>1242</sup> *Ibid.*, 305.

<sup>1243</sup> *Ibid.*

work of Hoffmann and others contributed to an already rich debate on the question of airs by the mid-eighteenth century.<sup>1244</sup>

While Boantza and Tomory's article puts a spotlight on a different set of actors than the typical Lavoisier entourage, it still chooses to study a limited number of published works written by some established names of early modern chemistry. While this in no way undercuts the quality of the argument, I believe that a wider perspective can complement and extend the validity of this article's findings. Inquiring on the nature of the airs dissolved in mineral waters became a step in chemical analysis. The reports therefore present a new space in which to view the developments of air chemistry.

The corpus of analyses I gathered skews towards the end of the century. But in accordance with Boantza and Tomory's conclusions, the inclusion of air analysis in the reports began much earlier than the typical narrative of the history of pneumatic chemistry. Overall, more than half of the analyses included a discussion of the air (58% to be exact). It is likely, however, that when the waters contained no air, the tests that led to this conclusion were simply not mentioned. Although a number of the reports that included no air analysis were conducted within the first half of the century, seven different reports that did include it were made before 1770, with the earliest in the corpus being Lemaire's 1750 analysis of the waters of Bussang.<sup>1245</sup> Lemaire's interest in the spirit of waters was the result of his readings of Peter Shaw's 1734 water analysis.<sup>1246</sup> Citing Shaw, he went about "examining, what some like to call the mineral spirit."<sup>1247</sup> He first stated that the waters of Bussang contained some kind of air, which he gave four elements of proof for. The first proof was the "prodigious quantity of small pearls" which appeared on the sides of bottles, especially if the bottles were subject to a temperature change.<sup>1248</sup> Another indicator was the fact that the caps of the bottles, when exposed to heat, popped "with some noise".<sup>1249</sup> The bubbles that formed directly in the fountain were the third proof. They were specified to be spheroid

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<sup>1244</sup> Ibid, 330–331. The conclusion also cements this idea, ending on the lines: "Mineral waters were among the contexts in which aerial substances had been studied and discussed extensively before 1750. These treatments, analyzed above, advanced ideas and views about the constitution of atmospheric air as well as the possibility of fixation and liberation of air from liquids, and solids, upon which later pneumatic chemists would build."

<sup>1245</sup> This is not representative of the earliest discussions of airs in waters, but it does show the point at which they became more frequent.

<sup>1246</sup> Peter Shaw, "An Enquiry Into the Contents, Virtues, and Uses, of the Scarborough Spaw-waters, With the Method of Examining Any Other Mineral-water," (London, Printed for the Author, 1734).

<sup>1247</sup> Lemaire, "Essai analitique sur les eaux de Bussang", 49. "Examinons presentement, ce qu'il plait à plusieurs, de nommer esprit minéral."

<sup>1248</sup> Ibid, "Je découvre à la vérité, dans nos Eaux de Bussang, une matière vaporeuse, qui est même en assez grande quantité ; comme on peut le voir. 1°. Par la quantité prodigieuse de petites perles, dont le fond & les parois internes des bouteilles, qui contiennent ces Eaux, sont semées ; qui augmentent, & en quantité & en grosseur, lorsqu'on transporte ces Eaux, d'un lieu frais, en un plus chaud ; & bien plus encore, si on les approche du feu."

<sup>1249</sup> Ibid, "avec bruit".

and measuring twelve or fifteen lines in diameter. His fourth and final proof required instruments: “4°. Finally by the great quantity of air, which escapes from those Waters; when put under the recipient of the pneumatic machine”.<sup>1250</sup> This machine, which was used for a number of applications in physics and chemistry became a common fixture of mineral water analyses.<sup>1251</sup>

Following these different observations, Lemaire gave indications of what the air he had just extracted might be: “I doubt that these elastic vapours, be anything else, than ordinary air mixed with those Waters, in great quantity”. He added to the “marks” that Shaw associated with ordinary air were found in the air of the waters of Bussang.<sup>1252</sup> Following this enquiry, Lemaire added an observation that he qualified as being more curiosity than useful proof. He said that no kind of fish could survive in these waters. The use of the body of animals as a way of testing the waters was often present when it came to the air. Aquatic animals were sometimes dropped in the waters and the time it took them to die was timed. This practice can be found in the analysis of Saint Alban by Rostain who proceeded similarly with frogs and amphibians.<sup>1253</sup>

In the 1770s, the numerous analyses of the physician Laprade show an evolution of his methods for analysing air over the years. In what was likely his first analysis, that of the waters of Saint Alban in 1772, he simply mentioned that snakes and frogs died in the water, and conjectured that this was due to the quantity of air in the waters. He theorised that since a lack of air kills people, and an excessive quantity of it might be lethal too.<sup>1254</sup> A year later, his analysis of the waters of Montbrison was a little more detailed and careful on the subject. He explained that the waters owed their stingy taste to “an overabundance of air combined with it”. He completed this sensory description with an experimental measure, stating: “the experiment of the shake and the bladder are to us a demonstrative proof on this object.”<sup>1255</sup> There was still no

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<sup>1250</sup> Ibid, “4°. Enfin par la grande quantité d'air, qui se dégage de ces Eaux ; lorsqu'étans mises sous le récipient de la machine pneumatique”.

<sup>1251</sup> Viel, “L'évolution du laboratoire et des instruments de chimie vue au travers des ouvrages à planches, du XVIIe à la fin de la première moitié du XIXe siècle.”, 22.; Lawrence Badash, “Joseph Priestley's Apparatus for Pneumatic Chemistry,” *Journal of the History of Medicine and Allied Sciences* 19, no. 2 (1964).

<sup>1252</sup> Lemaire, “Essai analytique sur les eaux de Bussang.”, 51–52. “cependant je doute que ces vapeurs élastiques, soient autre chose, que l'air ordinaire mêlé à ces Eaux, en grande quantité : en effet, les marques auxquelles Mr. Shaw veut que nous reconnoissons l'esprit minéral, dont nous parlons ; conviennent à l'air ordinaire & le caractérisent”.

<sup>1253</sup> In addition to using aquatic animals, Rostain also used a bladder in order to collect the air in the water. Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

<sup>1254</sup> Analysis of the waters of Saint Alban by Laprade, earliest (1772), Ms 120, f254–257, AAL. Ajoute que les serpents et les grenouilles meurent dans cette eau. “nos corps meurent à deffaut d'air; le même effet ne peut-il pas arriver lorsque nous respirons dans un millieu surchargé d'air?”

<sup>1255</sup> Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284–287, AAL. “L'eau de ces deux sources est limpide, elle a un goût acidule, et doit son piquant à une surabondance

quantitative measure of the air in this analysis however. This would have to wait another two years, when Laprade took on the analysis of the waters of Sail-sous-Couzan. He described their great “bubbling” and measured the height of the jets of air being between four and five inches tall. He also noted that the sealed bottles which kept the waters often exploded during transport. After these considerations, he explained that he received some help with the remaining part of the air analysis: “I have made the experiment of the bladder with M. Venel charged by the government to analyse all the mineral waters of the kingdom; 22 ounces of water gave us nine inches and a few cubic lines of air.”<sup>1256</sup> Laprade therefore learned air analysis directly from one of the authorities in the field. But even the evolution between his first and second analysis shows an increased sensitivity to the question of air chemistry.

Venel was adamant about the importance of air analysis, and it is likely that his conviction made an impression on the Lyon doctor, because in Laprade’s final analysis of the waters of Ambert, he included this experiment again: “a bladder adapted to the neck of a bottle gave me one and three quarters cubic inches of fluid by pound of water.”<sup>1257</sup> He used this measurement to argue that these waters could in fact not be classified with gaseous waters, despite containing some quantity of elastic fluid.<sup>1258</sup>

Thanks to his travels, Venel had the unique opportunity to inform other analysts of his methods in person. The same could not be done by the other influential chemists mentioned by Boantza and Tomory, but that did not mean that their influence did not spread. Hoffmann has already been shown to be a reference to the analysts, including in the late eighteenth century when he was long dead.<sup>1259</sup> Hoffmann was also a pioneer of the use of the pneumatic machine, which became increasingly popular towards the end of the century.<sup>1260</sup> A version of the apparatus named the chemical-pneumatic device was featured in Lavoisier’s *Traité Élémentaire de Chimie* as an indispensable accessory to any modern laboratory, with its invention being credited to Priestley.<sup>1261</sup>

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d'air combiné avec elle; l'expérience de la secousse et de la vessie sont pour nous une preuve démonstrative sur cet objet.”

<sup>1256</sup> Analysis of the waters of Sail sous Couzan by Laprade, (1775), Ms 120, f279–280, AAL. “leur bouillonnement est considerable, et il s'en élève de petits jets à quatre ou cinq pouces de hauteur. ces eaux sont très limpides et fort aérées; elles font eclater souvent les bouteilles dans lesquelles on les transporte. j'ai fait l'expérience de la vessie avec M. Venel chargé par le gouvernement d'analyser toutes les eaux minérales du royaume; 22 onces d'eau nous ont donné neuf pouces et quelques lignes cubiques d'air.”

<sup>1257</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL. “une vessie adaptée au gouleau d'une bouteille m'a donné un pouce trois quart cubique de fluide par livre d'eau.”

<sup>1258</sup> Ibid, “quoiqu'elle contienne un peu de fuide elastique, elle ne peut pas etre mise dans la classe des eaux gaseuses.”

<sup>1259</sup> Analysis of the waters of Bouillaut by Fleury l’Aîné, (1776), SRM 91B, dossier 33, ASRM.

<sup>1260</sup> Hoffmann, “Analyse parfaite des eaux de la fontaine du Bas Selter, traduit de l'allemand en françois par Pierre-Théodore Leveling,” 8.

<sup>1261</sup> Antoine Laurent de Lavoisier, “Traité élémentaire de chimie, présenté dans un ordre nouveau et d'après les découvertes modernes par M. Lavoisier,” (A Paris : chez Cuchet, 1789),

Chifoliau, in his analysis of the waters of Saint Suliac, lamented not being able to find the pneumatic device as he was making his experiments. He believed that the use of a bladder to collect the air was not reliable, and so he relied on simple observation in order to determine the gaseous nature of the waters he was analysing.<sup>1262</sup> There were, however, plenty of other variations on that method that Chifoliau did not consider. Especially from 1780 onwards, analysts used a vast array of different techniques in order to best extract the air from a mineral water.

The analyst of the waters of Prêmeaux, after observing the many bubbles bursting the surface of the water, decided to take on the experiment of the bladder. To do this, he used an empty and wet animal bladder, which he fitted atop a funnel, leading to a bottle containing some of the mineral water. After shaking the bottle, its air ended up trapped inside of the bladder. The air he obtained had the property of whitening limewater and dimming the flame of a candle placed in a bell.<sup>1263</sup> This he concluded was the sign of an aerial acid, one that the water had contracted in its travels through “the very entrails of the earth”.<sup>1264</sup>

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xliv. “Les Chimistes françois ont donné dans ces derniers tems le nom de pneumat-chimique à un appareil à la fois très-ingénieur & très-simple imaginé par M. Priestley, & qui est devenu absolument indispensable dans tous les laboratoires. Il consiste en une caisse ou cuve de bois plus ou moins grande, planche V, figures 1 & 2, doublée de plomb laminé ou de feuilles de cuivre étamé.”

<sup>1262</sup> Analysis of the waters of Saint Suliac by Chifoliau, (1781), SRM 92 B, dossier 49, ASRM. L’expérience de la vessie est “defectueuse”.

<sup>1263</sup> This method of identifying the gaz was common, and was directly mentioned in the analysis of the waters of Noyers: Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM.

<sup>1264</sup> Analysis of the waters of Prêmeaux by Maret, (between 1779 and 1787), SRM 91B, dossier 17, ASRM. “On voit continuellement selever de différents points de petites bulles qui crevent à la surface de l’eau. Ce fluide aëriiforme recueilli dans une vessie vide à l’aide d’un entonnoir, a blanchi l’eau de chaux et éteint les bougies plongées dans des cloches qu’on en avoit rempli. Cette observation et les expériences prouvent que l’eau de premeaux contient de l’acide aerien et que ce fluide lui est fourni par une décomposition qui se fait du calce dans les entrailles même de la terre.” This was likely a reference to the theory of the different kinds of dissolution that a gaz could have with water. According to Venel’s work, the gaz could either be dissolved mechanically, in which case simply shaking the liquid would release the trapped gaz (a mechanical action), or it could be dissolved chemically, which would require a chemical release. Here, Maret refers to the latter type of dissolution, by saying that it happened in the “entrails of the earth”, means that it was a chemical process, and not a mechanical one. See: Diderot, Rond, and Jaucourt, “Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.”, Tome 3, Article “CHYMIE ou CHIMIE”, 408–437.

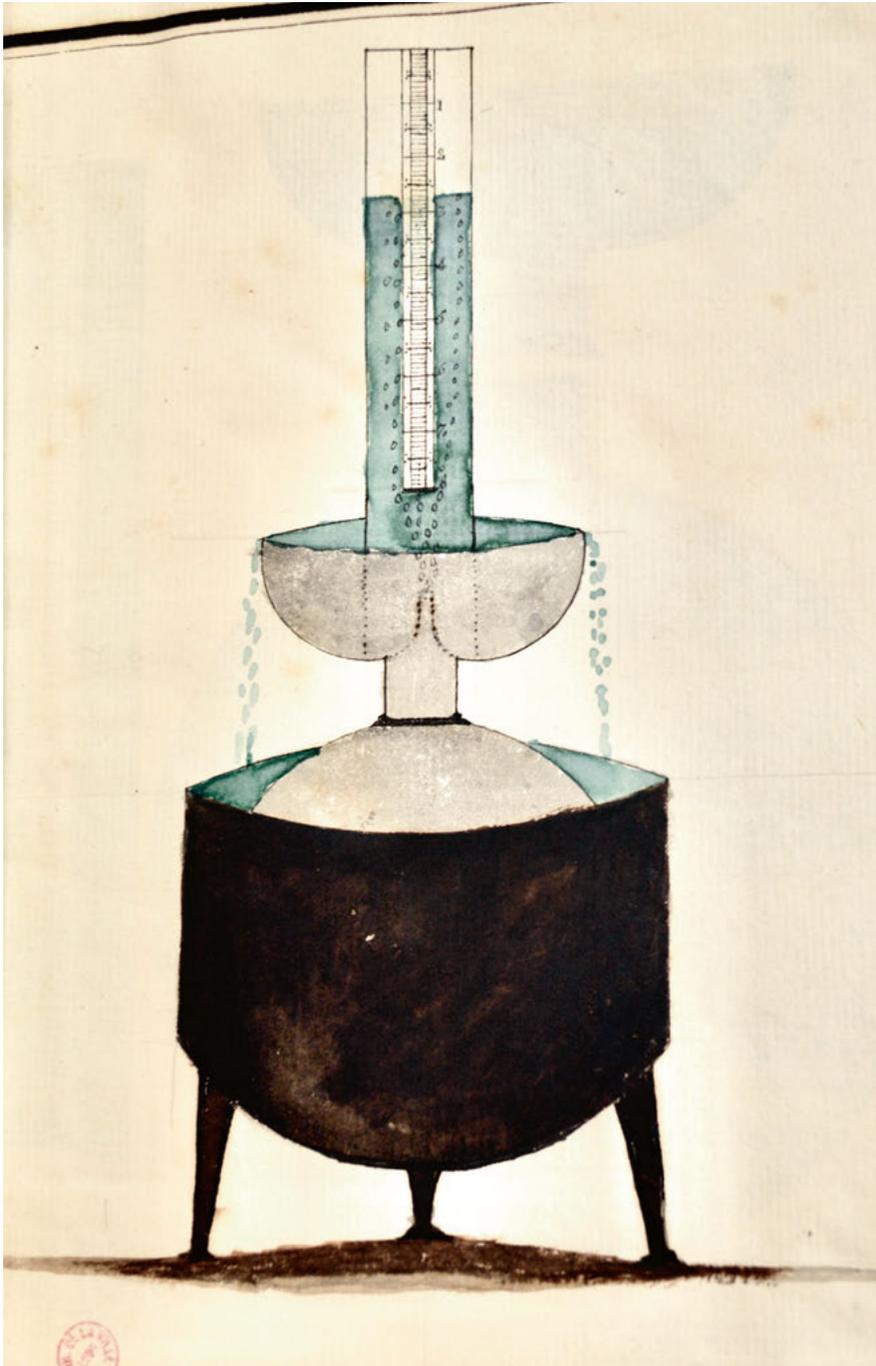


Figure 8.1 Hydro-pneumatic machine of Mr. Lanoix. (Ms pa 206, f1-4, AAL). Courtesy of the Académie des Sciences, Belles Lettres, et Arts de Lyon.

In one instance, Lanoix, a pharmacist in Lyon, was motivated to design a new instrument specifically for the purpose of extracting airs from mineral waters. He had previously worked on the analysis of the waters of Orléanas and explained: “I was not able to determine the quantity of air that these waters contain, because having used the apparatus of M Hales, I was not happy with the results of the operation”.<sup>1265</sup> Despite referring to Hales as a “knowledgeable naturalist”, Lanoix believed that his instrument was flawed. He therefore conceptualised a different version of it, which he hoped would solve those issues (see Figure 8.1).

The Academy in Lyon met to discuss the potential advantages of the proposed instrument. They alluded to having seen it in action, claiming that it appeared to work as designed. They agreed with Lanoix on the issues with Hales’ machine, pointing out ways of mitigating them, but admitting that they were not always sufficient. They then pointed to potential issues with Lanoix’s system. They stated that the gradations on the instruments were not precise enough. They added that it was a shame that the instrument could not be used for other purposes than water analyses but conceded that Lanoix had not set out to solve any other problem, and that this could not be held against him. In conclusion, they praised Lanoix for his ingenuity.<sup>1266</sup> Such discussions point to the relevance of water analyses in the wider field of chemistry. Analysis led to innovations in instrumentation, since it required a high level of precision and enticed analysts to constantly try and improve their methods, and subsequently share them with others in the field.

The later decades of the period showcased an awareness by analysts that the theory of airs was a much debated one. Cuel in his analysis of the waters of Martres attempted to navigate the recent multiplication in treatises on the topic by stating: “These waters contain a volatile principle called fixed air by mr priestley, elastic fluid by mr lavoisier, mephitic gas by mr macquer.”<sup>1267</sup> This allowed him to show his knowledge of chemical news, but also to pick a favourite as he then stuck with Macquer’s “mephitic gas” throughout the rest of the analysis. Cuel’s analysis was also a revealing one which showed the kind of experimental freedom that existed around air chemistry, more so than for the rest of the water analysis. Because this aspect of chemistry was so new and debated, many tried to innovate by attempting unconventional

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<sup>1265</sup> Minutes of the Academy of Lyon, “Hydro pneumatique de M. Lanoix, Mtre en pharmacie à Lyon pour extraire et recevoir le principe gaseu des eaux minérales”, (1779), Ms pa 206, f1–4, AAL. “Dans le mémoire concernant l'analyse des eaux d'orlienas que j'ai eu l'honneur de presenter à votre ac[adémie] je n'ai pu y déterminer la quantité d'air que les eaux contiennent, parceque m'étant servi de l'appareil de M Hales, je n'ai pas été content des resultats de l'opération en raison de l'air athmosphirique qui se trouve renfermé dans les vaisseaux qui composent la machine de ce savant naturaliste”.

<sup>1266</sup> Report on Lanoix’s memoir by members of the Academy, (1779), Ms pa 206, f5–8, AAL.

<sup>1267</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “Ces eaux contiennent un principe volatil appellé air fixe par mr priestley, fluide elastique par mr lavoisier, gas mephitique par mr macquer.”

experiments. In this case, Cuel wanted to be sure of the acidity of the gas he had just isolated, since “today all chemists seem to convene that this mephitic gas has all the characteristics of an acid”.<sup>1268</sup> He put together a method that should theoretically help him in doing so. He inserted a half pint [*chopine*] of water into a cucurbit. He adapted a marquee to the cucurbit and placed violet syrup in its gutter. After finely tuning his instruments, he placed the apparatus in a sand bath. What he expected to see, was the water evaporating slowly, and as its vapours going over the violet syrup. Since violet syrup was a reagent sensitive to acids, it should have turned red. But that did not happen, and Cuel was puzzled by the result. He described how he watched the apparatus for two days of slow evaporations, without noticing the slightest change in the syrup. Perplexed, he called for the help of his colleague Chappel, who was described as a chemist of “well-deserved reputation”.<sup>1269</sup> Together, they managed to come up with a theory which would explain this confusing observation, involving the formation of a neutral salt during evaporation which would stop violet syrup from giving the expected change in colour.

This kind of proactive attitude was typical of the air analysis, and shows the empowerment of analysts in exploring one of the most active area of chemistry. This extends the argument of Boantza and Tomory to the end of the century. They argue that mineral waters provided a context for the development of air chemistry in the beginning of the century; these examples show that mineral water chemistry remained a place of questioning and testing air chemistry across the entire century.

## The contentious use of reagents

Like other aspects of the chemical analysis of waters, studying a substance by the way it reacted with specific chemicals was already commonplace by the beginning of the eighteenth century. This method was however less ancient than sensory analysis or the physical appraisal of products. The chemist Boyle is credited with popularising the use of reagents, or *réactifs*, in analytical chemistry.<sup>1270</sup> A reagent was a product that once added to a solution, reacted in a way that was visible, unique, and if possible fast. For example, a popular reagent used in contemporary chemistry is dried copper sulfate. This white

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<sup>1268</sup> Ibid, “aujourd'hui tous les chimistes paroissent convenir que ce gas méphitique a tous les caracteres d'un acide”.

<sup>1269</sup> Ibid, “mr chapel apotichaire de cette ville dont les connoissances en chimie luy ont données une reputation si bien meritee, fut le premier a qui je communiquai ma difficulté; ce chymiste me repondit qu'il croyoit que la couleur verte n'estoit due qu'au depot terreux ou martiale qui se formoit dans le meme instant de l'evaporation du gas”.

<sup>1270</sup> David E. Goodney, “Acid–Base Chemistry According to Robert Boyle: Chemical Reactions in Words as well as Symbols,” *Journal of Chemical Education* 83, no. 7 (2006).; Hamlin, *A Science of Impurity, water analysis in nineteenth century Britain.*; Allen G. Debus, “Sir Thomas Browne and the Study of Colour Indicators,” *Ambix* 10, no. 1 (1962).

powder instantly becomes bright blue when it comes into contact with water. This reaction is very easy to spot, (the colour change is obvious), it is immediate, so the test does not need to take long, and copper sulfate only reacts in this way in the presence of water, meaning that it does not create false positives. For a chemist then and now, this would be considered an ideal reagent. By using a succession of several such reagents, a chemist can expect to eventually find all components in any solution.

Mineral waters were understood to be a solution of water containing a number of salts, minerals, metals or other kinds of solutes like airs. Some of these minerals could be identified reliably by taste, but the exact nature of each salt for example was impossible to access by the senses alone. This is why reagents were a popular technique in use for water analysis. If an analyst had access to dozens of reagents which could each indicate the presence or absence of a variety of potential solutes, this made the analysis much easier. To give an example, if the reagents showed with absolute certainty that the water contained vitriolic salt, all that was left to do was to evaporate the water, treat the residue to eliminate everything but vitriolic salt, and weigh the resulting dry product. Essentially, knowing ahead of time what to expect in the water made the end of the analysis much easier. At the residue stage, everything was mixed together and sometimes very difficult to separate if one did not know what to look for. The reagents were therefore an important element of redundancy.

Reagents were a staple of mineral water analysis. They were used only slightly less often than the sensory analysis, with eighty-three out of ninety-three analyses including the use of at least one reagent. On average, each analysis used at least six.<sup>1271</sup> They were also used fairly consistently throughout the period, with a slight increase of non-inclusion for the end of the period that might be due to the choice of sources.<sup>1272</sup> The reviewer of a 1802 water analysis described how a typical analysis by the reagents was to be conducted.

The steps that Citizen Tingry has followed to take advantage of the reagents does not differ from that of most chemists. that is to say that following their example, he mixed in succession with varying quantities of water [...], saline solutions, acids, alkalis, metals, oak Gall tincture, violet syrup, limewater &c. and he has taken great care in observing all changes that these agents caused either in the transparency of the mineral water, or in its colour and its flavour.<sup>1273</sup>

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<sup>1271</sup> See Appendix n°[4] for an ordered list of the reagents.

<sup>1272</sup> Most of the analyses in the corpus in the 1790–1810 time period come from the minutes of the *École de Médecine*. These archives tend to have succinct analyses, and few full detailed reports, which is likely why the reagents stage was not always included.

<sup>1273</sup> Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN. “La marche que le Citoyen Tingry a suivi pour tirer partie des réactifs ne differe pas de celle de la plupart des chimistes. c'est à dire qu'à leur exemple, il a mêlé successivement à différentes quantités d'eau nouvellement puisée à sa source, des solutions salines, des acides, des alkalis, des métaux, de la teinture de noix de Galle, du syrop de violettes, de l'eau de chaux &c. et qu'il a eu grand soin

This quote summarises what “most chemists” did when it came to the use of reagents. Indeed, the categories of acids, alkali and the other chemicals cited were used by analysts throughout the century. That being said, there was no single path to analysis. What the quote does not highlight was the fact that reagents, despite being widely used, were a more controversial step in chemical analysis. While not all chemists took the time to record the temperature of the water they analysed, they were rarely opposed to the idea of others doing so. The reagents however, led to much disagreement as to their utility, and especially regarding which reagents to use.

From the eighty-three analyses that used the reagents, I tallied a total of 129 different reagents used in at least one report. A little under half of those (fifty-four to be exact) were only used once, or at least mentioned once. Unfortunately, many of the reports tended to include only the reagents that gave a reaction. Consequently, the list of reagents used over the period is most likely longer than the 129 products I have been able to identify, and the average number of reagents used per analysis was likely higher too.<sup>1274</sup>

Because the reactions were not always easy to observe, there often existed different reagents for any given solute. Oak gall tincture and Prussian alkali were two separate tests of iron, and eight different analyses used them both, as a redundancy measure. The reagents were also very varied in nature and appearance. Some were preparations, some were liquid, some solid, others had to be soaked on paper.

#### *Different laboratory practices around the use of reagents*

In protocols describing best practices in the use of reagents, the most practical considerations were not always included. Such protocols typically gave a suggested list of reagents and did not often account for the variety of ways in which analysts actually used them.<sup>1275</sup> But as with the other analytical techniques, some indications can be glanced occasionally from the reports. Analysts proceeded by filling several glasses with water, either at the spring or at the laboratory, and added the reagent to these small quantities of water.<sup>1276</sup> They then observed and noted any reaction or differences in colour. Sometimes the analyst had to note the formation of a precipitate, or the presence of an effervescence. But at other times, the reactions could be lengthy and

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d'observer tous les changements que ces agents occasionnoient soit dans la transparence de l'eau minerale, soit dans sa couleur et sa saveur.”

<sup>1274</sup> See the complete list of reagents in Appendix n°[4].

<sup>1275</sup> Bergman offered a chapter on the use of reagents, in which he was thorough regarding the nature of reagents used, but said little about the gestures and procedures used in practice. Bergman, “Physical and Chemical Essays.”, 124–146.

<sup>1276</sup> This report complained that only a half dozen goblets could be found on the site of the spring, which also suggests that all of these reagent tests were done simultaneously. Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM. “manquant de tout sur les lieux où je pus à peine me procurer une demi douzaine de gobelets, malgré toute la bonne volonté du curé, le seul fourni dans le village”.

complex. Paret when he used the dissolution of silver in the waters of Donzy, first observed a white cloud, then a blue precipitate, and then noted the rest of the solution had become green: he therefore initially concluded that the water contained copper. Soon after, the precipitate changed again, and took a shade of darker purple. Paret revised his conclusion and guessed that a sulphurous matter must have caused the succession in colours.<sup>1277</sup>

This analysis also mentioned a technique which appeared a few times throughout the corpus, which was the habit of using reagents on partially concentrated water. By evaporating a third, or half of the water, the minerals present were believed to be still in the water for the most part (except for the airs), and since their concentration had been artificially increased, the reagents could show clearer reactions. This was done in an analysis by Gavinet in 1763, but most of the other examples of this came from the end of the century.<sup>1278</sup>

If the reaction did not occur right away, some analysts attempted to use reagents in combination.<sup>1279</sup> The method was therefore susceptible to adaptations to specific situations. The analysts did a lot of experimenting in order to get the most out of their reagents. One analyst for example made the mention of using controls throughout his reagent tests. As he added each reagent to the mineral water, he also added an equal amount of reagent to a control of distilled water, in order to make sure that the reactions he was witnessing were in fact due to the minerals in the water, and not just to the water itself.<sup>1280</sup>

The reagents were also used at different points of the analysis. Much like the tasting which occurred at the spring and during transport, analysts also used reagents at different points in order to gauge the stability of the waters. Chifoliau indicated that he used the reagents at intervals of six hours in order to catch any change. He then used them again the following day, and once he had gotten home from his trip to the spring.<sup>1281</sup> Cuel did a similar test, by testing the waters of Labatisse both at the spring and back in his laboratory.<sup>1282</sup> He noted some differences in the strength of the effervescence. This suggests that he had taken precise notes of his observations while at the spring. This test of stability was probably done because unlike the dry analysis, the reagents were rather quick to use, especially the second time around. Once the

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<sup>1277</sup> Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM.

<sup>1278</sup> Gavinet concentrated the waters to their “twentieth part” and used the reagents on both untouched and concentrated waters. Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL.

<sup>1279</sup> An example of this in: Analysis of the water of Orliénas by Tissier, (1778), SRM 91A, dossier 2, ASRM.

<sup>1280</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

<sup>1281</sup> Analysis of the waters of Veugarni by Chifoliau, (1780), SRM 93A, dossier 19, ASRM. Chifoliau did the same in his analysis of Saint Suliac. Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>1282</sup> Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM. He also mentioned in his analysis of the waters of Saint Nectaire that he had travelled to the spring in order to improve the results of the reagents. Analysis of the waters of Saint Nectaire by Cuel, (1782), SRM 92B, dossier 43, ASRM.

analysts already knew which reagents were going to give a reaction, they only had to repeat those tests.<sup>1283</sup> The reagents were also used throughout the rest of the analysis. Some analyses even used more reagents during the dry analysis than they did at the start. Those reagents would be used in order to check that the different solutions had been separated properly, to see if all the iron had been removed from a sample for example. Other reagents were applied directly to the residues. Even detractors of the reagents tended to use them in this way, which is why they were so ubiquitous in water analysis.

*Tailoring the choice of reagents to the water's composition: popular and eccentric picks*

The list of reagents, when ordered by number of occurrences, shows that two products stood out. Used sixty-nine and sixty times respectively, the most popular reagents were the oak gall tincture and the violet syrup.<sup>1284</sup> The first, called oak gall tincture, or *Noix de Galle* in the original French, was a product obtained from oak tree.<sup>1285</sup> Because it contains high levels of tannic acid, it reacts with iron to create a dark reddish colour. The chemists of the *Ancien Régime* were aware of that reaction and they harvested oak gall in order to create a popular and relatively inexpensive test of iron. The test was very sensitive, which is why it was particularly useful for mineral waters, which often contained minute amounts of metals. In very low concentrations, the oak gall would often turn a light pink, instead of its typical dark colour. This sliding scale was convenient because it gave the analysts an idea of the quantity of iron in the water, before the quantitative analysis.

The oak gall tincture was used in varying forms. It was sometimes chopped raw,<sup>1286</sup> added as a powder,<sup>1287</sup> infused in water,<sup>1288</sup> or in spirit of wine,<sup>1289</sup> to form a variety of versions suited to the preferences of individual analysts. Some of the earlier analyses in the century used buckets of oak gall at every possible stage of the analysis.<sup>1290</sup> Trust in that reagent was high, especially throughout the first half of the eighteenth century. After witnessing the oak gall turn to red in the water, the analyst of the waters of Vitry-le-François

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<sup>1283</sup> Analysis of the waters of Pouzaugues by Gallot, (1784), SRM 91A, dossier 13, ASRM.

<sup>1284</sup> See the full list of reagents in Appendix n°[4].

<sup>1285</sup> When oak is attacked by parasite or certain types of fungi, it sometimes reacts by creating an outgrowth around the point of attack. These growths can vary in size and shape, but they are typically between the size of a walnut and that of a fist. These growths are what is called the oak gall.

<sup>1286</sup> Lanoix, "Analyse des eaux minérales d'Orliénas.", 17.

<sup>1287</sup> Analysis of the waters of Trye-le-Château by Cornette and Lassone fils, (1779), SRM 93A, dossier 11, pièce 4, ASRM.

<sup>1288</sup> Report by Gland on the analytical essay by the reagents on the waters of the Mont Kemmel, (1785), SRM 93 B, dossier 35, ASRM.

<sup>1289</sup> Bergman, "Physical and Chemical Essays.", 130.

<sup>1290</sup> Marguery, "Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris."

expressed: “This Proof, almost by itself, can suffice to the connoisseurs”.<sup>1291</sup> Linacrier stated in another report: “Almost all chemists convene that oak gall is a light absorbent”, alluding to the commonality of the reagent. He then gave an entire description of the chemistry responsible for its particularly useful properties, followed by a series of experiments using the oak gall.<sup>1292</sup>

The runner up to most popular reagent of the eighteenth century, was violet syrup, called either *sirop de violettes* or *sirop violat* in French. This liquid reagent could be bought in an apothecary’s dispensary for 5<sup>s</sup> in 1714, making it a relatively affordable product.<sup>1293</sup> The syrup had the useful property of changing colour when coming in contact with bases, which were called alkalis at the time, and acids. Many other plants have this property and can therefore be used as rough pH-metres, but the violet was the most used in water chemistry. Its distinctive purple colour turned noticeably green when meeting alkalis. It was sometimes substituted for the tincture of sunflower, which served a similar acid-base indicator purpose.

Another category of reagents which were often used in conjunction were the metallic dissolutions of silver and mercury in nitrous acid.<sup>1294</sup> The latter was used in thirty-six different analyses, making it a popular choice. Instead of changing colour, this solution was notable for producing a metallic precipitate in the presence of certain minerals. The metallic dissolutions were less affordable than the oak gall, since the metals themselves were expensive ingredients. Some of the cheaper reagents were those that required no dedicated supplier. Placing a silver coin, a piece of cutlery, or even a silver platter in the spring, and watching for a darker colour on its surface was a common test of Phlogiston, used in twenty-two analyses. Similarly, a lot of chemists attempted to dissolve soap in the water, in order to gauge its hardness.

Moving down the list of reagents, most of the products used between five and twenty times were various acids, alkalis and salt dissolutions. The complete list of reagents contains fourteen different kinds of acids, the most used being the vitriolic acid. The various alkalis existed in fifteen different variations. The most common ones by far were the fixed and volatile alkalis, used in combination almost seventy times. Acids, alkalis and salts made up the majority of reagents.

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<sup>1291</sup> Analysis of the waters of Vitry le François by Grosse, (1738), SRM 93B, dossier 29, ASRM. “Cette Epreuve, presque toute seule, peut suffire aux connoisseurs, pour dire qu’elle contient du vitriol.”

<sup>1292</sup> Analysis of the waters of Vallers by Linacrier, (1777), SRM 93A, dossier 16, ASRM. “Presque tous les chimistes conviennent que la noix de galle est un leger absorbant”.

<sup>1293</sup> Nicolas Lémery, “Traité universel des drogues simples, mises en ordre alphabetique: Où l’on trouve leurs differens noms, leur origine, leur choix, les principes qu’elles renferment, leurs qualitez, leur étimologie, & tout ce qu’il y a de particulier dans les animaux, dans les vegetaux & dans les mineraux. Ouvrage dépendant de la Pharmacope’e universelle,” (A Paris chez Laurent d’Hourt, 1714).

<sup>1294</sup> Nitrous acid was one of the rare acids capable of dissolving mercury.

In the lesser used products, a number of substances of vegetal or animal origin can be found. The oak gall was not the only tree product, as the tincture of wood of “pernambouc” was also employed. But this category also included much stranger products, like the decoction of crayfish eyes, which only appeared in one analysis, but which was apparently for sale at an apothecary in 1714 for 6] a *gros*.<sup>1295</sup> Despite attempts at reducing the number of reagents later in the century, the use of somewhat unusual products, like the “blood lye”, still took place as late 1788.<sup>1296</sup>

In general, the list of reagents shows the analysts’ habit of using reliable products, like oak gall tincture or vitriolic acid. The variety in acids and alkalis suggests personal preferences or access to certain products, rather than disagreement on chemical theory. But the long list of unique reagents also shows an incline towards innovation. As late as 1789, an analyst showed a yet unseen technique of evaluating the properties of waters by mixing them with many different milks.<sup>1297</sup>

The reactivity-based tests were also a prime place in the report for the analysts to make use of their education in chemistry, and to sometimes make claims that could apply to other areas of the field. Laprade made a comment of that nature in his analysis of the waters of Saint Alban. He noticed that a Prussian blue solution remained neutral for half an hour before producing a white precipitate. The addition of a few drops of marine acid could then restore the Prussian blue. He concluded: “this confirms the already accepted idea among chemists, that phlogisticated alkali has no action on pure and isolated iron”.<sup>1298</sup> Linacier adopted this scientific posture with almost all the reagents that he used. Each time he attempted to give a full chemical explanation for the reaction he witnessed, explaining which affinities and laws were responsible for the apparition of the different colours. In fact, he spent so much of his report on the reagents that when he returned to the analysis, he referred to it as “getting back on track”,<sup>1299</sup> after having gone on a long tangent.

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<sup>1295</sup> Lémery, “Traité universel des drogues simples, mises en ordre alphabetique: Où l'on trouve leurs differens noms, leur origine, leur choix, les principes qu'elles renferment, leurs qualitez, leur étimologie, & tout ce qu'il y a de particulier dans les animaux, dans les vegetaux & dans les mineraux. Ouvrage dépendant de la Pharmacope'e universelle.”

<sup>1296</sup> Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM.

<sup>1297</sup> Marsonnat, “Les eaux minérales de Charbonnieres, dites de Laval, en Lyonnais.”

<sup>1298</sup> Analysis of the waters of Saint Alban by Laprade, earliest (1772), Ms 120, f254–257, AAL. “la lessive saturée de la matière colorante du bleu de prusse parfaitement neutre, y occasionne au boût d'une demi-heure, un précipité blanc. si on veut avoir un bleu de prusse, on n'a qu'à ajouter à ce mélange quelques gouttes d'acide marin; sans cette addition, le précipité est toujours blanc. ceci confirme l'idée déjà recüe parmi les chymistes, que l'alkali phlogistiqué n'a point d'action sur le fer pur et isolé, qu'on n'obtient un précipité bleu que lorsque le mars est en dissolution dans l'eau par un acide.”

<sup>1299</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. “reprend le fil”.

### *The critiques of reactivity-based testing*

Not all analysts enjoyed using the reagents as much as Linacier did. Some expressed doubts regarding the validity of the observations that could be inferred from their use. The reagents were numerous, complex, and sometimes reacted ambiguously. The reports therefore included doubts as to whether analysts, and chemists in general, should carry on using them.

The first sceptic in the corpus was Venel. He believed the use of the violet syrup was “equivocal”, and “illusory”, when determining the presence of an alkali, even calling it “useless in most research of this nature”.<sup>1300</sup> He explained that the use of reagents gave, at best, a relative idea of the contents of the water, but could never provide “positive”<sup>1301</sup> knowledge. What he meant by that, was that a reagent was only able to detect that a water contained more or less of a mineral than a control, but that it was not reliable in determining whether that mineral was in the water by itself. His opinion was not shared by all, and in fact, another analysis of the same waters done by Machy referred to that very comment: “I am far from viewing this experiment as *equivocal or illusory*, I believe [...] by experience, that this mean is useful in demonstrating the various saline combinations contained in the waters”.<sup>1302</sup> This is not an entirely unexpected counter. As showed earlier, violet syrup was one of the most popular reagents of the century, it was therefore bound to have some defendants.

Another critic of the reagents was Thouvenel, who claimed that with “the fast & very considerable progress” of chemistry, the “insufficiency & infidelity of the Analysis by the reagents” had been recognised for a long time.<sup>1303</sup> He did not however believe that they should be banned outright. He referred to the arrogance of the chemists who skipped the reagents entirely and only deduced the principles of mineral waters from evaporation. To him, this was going too far, as a “well directed” use of the reagents could provide useful

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<sup>1300</sup> Venel and Bayen, “Analyses chimiques des nouvelles eaux minérales de Passy.”, 19. “équivoques, illusoirs, inutiles dans la plûpart des recherches de cette nature”.

<sup>1301</sup> Ibid, “certain et positif”.

<sup>1302</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 10. “ces dernières eaux ont leurs combinaisons assez exactes pour ne point altérer le Sirop de violettes. Car je suis bien éloigné de regarder cette expérience comme équivoque ou illusoire, je crois, & cela d'après l'expérience, que ce moyen sert à démontrer que les combinaisons salines quelconques contenues dans les Eaux de Madame Belami, y sont dans un degré de justesse qui ne permet aucune surabondance ni du côté des acides, ni du côté des bases”.

<sup>1303</sup> Thouvenel, “Mémoire chymique et médicinal sur les principes et les vertus des eaux minérales de Contrexeville en Lorraine.”, x–xi. “Quoique les progrès rapides & très-considérables qu'a fait la Chymie, aient singulièrement influé fur la manière d'analyser les Eaux minérales, cependant il faut convenir qu'il manque encore quelque chose à l'infailibilité de nos recherches. Il y a longtemps qu'on a reconnu l'insufisance & l'infidélité de l'Analyse par les réactifs”.

preliminary observations.<sup>1304</sup> He added that a look at the surrounding geology was an equally important preliminary inquiry, and that the good chemist should never cut himself from any source of knowledge. This was, once again, an argument in favour of redundancy.

Thouvenel's attitude towards the reagents was most common among critics. Outright dismissal was quite rare, and sceptical analysts simply recommended caution against the over-reliance on reactivity tests. Parmentier in his 1772 memoir warned against the many dangers of over-reliance on reagents, but he immediately amended his critique by adding: "I do not pretend to say here however that the attempts of the reagents are useless."<sup>1305</sup> He simply believed that the reagents had to be used by an intelligent man, and not by a careless optimist.

His colleague in Lyon, Laprade, harboured fewer doubts. He used plenty of reagents in his analyses, but perhaps with the kind of care suggested by Parmentier, he often used several reagents for the same test. He used the violet syrup in his analysis of Saint Alban but indicated that he was not surprised to see it turn, because so many other previous observations had already indicated the existence of an alkali in the waters.<sup>1306</sup> Laprade later had a change of heart regarding the reagents and adopted on a more sceptical stance. He said that the reagents could be viewed as "an absolutely useless hors d'œuvre for the trained artists in the analysis of mineral waters."<sup>1307</sup> He added that all chemists were convinced of this evidence, with the exception of the "acerbic" class, for which the reagents could still be of use. Since this change of mind occurred after his meeting with Venel, one could speculate that he might have played a part in convincing Laprade of the unreliability of reagents.

Some analysts expressed that the reagent stage could only lead to suppositions, or theories, that had to be confirmed by the dry analysis. Bertrand-Lagrésie did so in his analysis of the waters of Quercy. He believed that the waters probably contained at least a few "atoms" of iron, given the results of the reagents, but the evaporation was a more certain way of making sure of this. The ancient chemists had, in his view, too often relied on the reagents

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<sup>1304</sup> Ibid, "Ces inconvéniens, qu'on a sans doute beaucoup exagérés, sont en très grande partie prévenus ou réparés par des opérations préliminaires, par des expériences de comparaison, & par l'emploi bien dirigé de quelques réactifs".

<sup>1305</sup> Antoine Augustin Parmentier, "Observations sur la difficulté de bien procéder a l'analyse des Eaux minerales", (1773), Ms pa 206, f38–f49, AAL. "Combien n'avons nous pas d'exemples de l'infidélité des analyses faites par les seuls reactifs ! Je ne pretend cependant pas dire ici que les tentatives des reactifs soient inutiles". Ils doivent être employés par un homme intelligent."

<sup>1306</sup> Analysis of the waters of Saint Alban by Laprade, earliest (1772), Ms 120, f254–257, AAL.

<sup>1307</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL. "les réactifs pouvaient être regardés comme hors-d'oeuvre absolument inutiles pour les artistes exercés dans l'analyse des eaux minérales. on ne peut en effet rien conclure d'après les expériences que je viens de citer, sur les principes qui minéralisent l'eau d'ambert".

alone and made careless claims.<sup>1308</sup> Other analysts, being aware of the incertitude of the reagents, simply did not linger on them for too long, and only used the most reliable ones.<sup>1309</sup>

Generally, the attitude of analysts towards the reagents could almost be described as hypocritical, or at the very least contradictory. They were much decried, yet constantly used. Fourcroy was the most egregious example of this. In his analysis, he gave a history of the use of reactivity tests since Boyle, making sure to point out all of the failings of past chemists and their use of too many unreliable reagents. Following this long sceptical discussion, he went on to use no less than forty-eight different reagents himself, the most of any analysis in my corpus.<sup>1310</sup>

This attitude can be explained by the words of his contemporaries and colleagues at the *Société*. Cornette and Lassone Fils, both reviewers of chemical analyses, wrote a report on the analysis of the waters of Saint Honoré by Regnault. In their report, they supposed that the analyst “regards the examination with the reagents useless, or not necessary; since he has not employed them;”. The reviewers asserted on the contrary that it was “an indispensable necessity in the analysis of mineral waters”.<sup>1311</sup> This report shows that despite doubts, despite the unclear results, and sometimes unreadable and confusing reactions, the reagents remained an important step in chemical analysis, which ultimately led to their overwhelming presence in the analyses. Analysts simply could not afford to part with any of the tests that gave them substantial knowledge about mineral waters, no matter how fickle these tests were.

## Putting waters to the test of fire: the dry analysis

The steps of analysis detailed so far could feasibly be done anywhere. Whenever possible, the sensory analysis and the physical measurements took place directly at the spring. The use of reagents required a little more material, in the form of goblets and the products themselves, but if they were limited to the average of six or seven reagents, they could be transported to the spring. This was however not the case for the final step of the process, which was

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<sup>1308</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. The same attitude was expressed by Cuel in his own analysis. Analysis of the waters of Saint Nectaire by Cuel, (1782), SRM 92B, dossier 43, ASRM.

<sup>1309</sup> Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM.

<sup>1310</sup> Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, chapitre 7, 74–102.

<sup>1311</sup> Report by Cornette and Lassone fils on the analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. “il paroît qu'il regarde l'examen par les réactifs comme inutile, ou peu nécessaire ; puis-qu'il ne les a point employés ; quoi-que nous soyons bien convaincus qu'ils sont d'une necessite indispensible dans l'analyse des eaux minérales, servant à diriger les expériences de l'artiste et à lui tracer la route qu'il a à suivre pour acquérir des connoissances sur leur nature.”

often called the ‘dry analysis’. In its most basic form, this step consisted in taking a large amount of mineral water, evaporating it, and attempting to understand the makeup of the residue left in the vessel. This step required at the very least a steady fire and a few vessels. But most of the time, it required an entire panoply of glassware, distillation apparatus, and a variety of solvents, crucibles, and substances that would be used in the demanding task of separating the different components of the residue. In practice, this step was possibly the most varied and inconsistent of all other methods mentioned so far. In the reports, the description of the dry analysis ranged from a few lines to page after page of intricate chemical operations. The only true unifying aspect of the dry analysis was the use of fire. Everything else could vary.

Some form of evaporation was used in eighty-three cases out of the ninety-three. It was done exactly as often as the use of reagents, thus making it part of the canon for what a standard mineral water analysis should contain.<sup>1312</sup> When it was not included, analysts often stated reasons as to why, and even apologised for their lack of time or material.<sup>1313</sup> It should be noted that all ten reports that did not include a dry analysis were written between 1766 and 1803, and that its absence was not simply a sign of earlier analyses. Like the other steps of analysis, evaporation was featured in many chemical and alchemical works from the centuries prior.<sup>1314</sup> The crucible, which was sometimes used in the later parts of the dry analysis, was an even older apparatus.<sup>1315</sup> The general principles of dry analysis were changed very little throughout the entire early modern period. The variety was to be found in the details of how it was applied by various individuals.

One advantage of the dry analysis was that it did not necessarily require that the analyst travel to the spring. A few analyses were performed on waters that had been pre-evaporated by a technician at the spring, before being sent to the analyst. Maret provided an example of this. He was sent a reduction that

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<sup>1312</sup> It should be noted that the eighty-three analyses that included the reagents and the eighty-three that included the dry analysis are not the exact same. Only two analyses in the whole corpus included neither reagents nor dry analysis.

<sup>1313</sup> This was the case for the first evaluation of the waters of Enghien by Cotte and Macquer for example. They did not perform a full analysis because the dry analysis was the most intensive and costly part, and their purpose was simply to determine whether the water was mineral or not. Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, chapitre 2. In another example, the analyst of the waters of Tautavel apologised that his analysis did not include much detail, and said “if my occupations had allowed, I would have made further researches; but you know that the time I am obliged to give to my practice of medicine gives me a duty to not create long absences.” Analysis of the waters of Tautavel by Carcassonne, (1783), SRM 93A, dossier 3, ASMR. “si mes occupations me l'eussent permis, j'aurais fait des nouvelles recherches; mais vous scavez que le temps que je suis obligé à donner à ma pratique de medecine me fait un devoir de ne pas faire des longues absences.”

<sup>1314</sup> Lawrence Principe, *The Transmutations of Chymistry: Wilhelm Homberg and the Académie Royale des Sciences* (University of Chicago Press, 2020).

<sup>1315</sup> Eliade Mircea, *The Forge and the Crucible, The Origins and Structure of Alchemy* (University of Chicago Press, 1978).

had been made from 220 pounds of water down to 9 and 8 ounces, thus significantly lowering the shipping costs and the risks of breakage, but still allowing for an analysis on a large quantity of water.<sup>1316</sup>

Other analysts went the other direction and attempted to bring the laboratory with them. Chifoliau, after being told by the *Société* that his analysis needed improvement, responded with this eloquent plea:

I have surmounted the inevitable difficulties that one encounters in the provinces, when one wants to take care of chemistry. Obligated to order the vessels and the substances from the capital, my work has become longer and more tedious. I have done what I believed I had to do, or rather I have followed the road that my feeble lights have indicated.<sup>1317</sup>

The difficulties outlined by Chifoliau, especially regarding sourcing chemical vessels in the *province*,<sup>1318</sup> explains why his approach was less common. Most analysts preferred to proceed to the evaporation having the necessary material on hand, and the time to tend to their experiments for several days. The dry analysis was therefore typically done in a laboratory setting.

*Distillation: an increasingly optional step*

One method of obtaining information about a water was to subject it to distillation. This was not synonymous with the evaporation,<sup>1319</sup> but it was sometimes included with the rest of the fire-based analysis. During distillation, the water would be slowly evaporated in sections, and the vapours would be collected and separated. A distillation could for example be used as a way of extracting the volatile parts of the waters, before testing the remaining liquid with reagents.<sup>1320</sup>

A distillation required a steady fire, a retort, and some kind of vessel to receive the condensed vapours. One analyst attempted to perform one directly at the spring, and talked about the difficulties of sourcing even these basic

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<sup>1316</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM. “Cette eau quoique réduite de 220 livres 9 livres 8 onces avoit peu de saveur et étoit limpide sans couleur et sans odeur.”

<sup>1317</sup> Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM. “Animé du zèle de correspondre a la tâche que vous m’avez imposé, j’ai surmonté les difficultés inévitables que l’on rencontre en province, lorsqu’on veut s’occuper de la chymie. Obligé de faire venir de la capitale les vaisseaux et les substances, mon travail est devenu plus long et plus pénible. j’ai fait ce que j’ai cru devoir faire, ou plustot j’ai suivi la route que mes foibles lumières m’ont indiqué.”

<sup>1318</sup> Colloquial name for the regions of France that are outside of Paris.

<sup>1319</sup> The term ‘evaporation’ by itself referred to the practice of evaporating large amounts of water and studying the residue. Distillation also including the evaporation of some water, but it was a different process, which used its own set of vessels. When analysts used the term evaporation by itself, they referred to the former technique.

<sup>1320</sup> An example of this in: Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, 80, 85.

chemical vessels in the countryside, describing his valiant effort to fashion a retort using a piece of fabric.<sup>1321</sup> Distillation was more suited to the laboratory.

While for a long time, the terms ‘analysis’ and ‘distillation’ had been somewhat interchangeable, this changed during the eighteenth century when the technique fell out of favour and evaporation became the standard procedure.<sup>1322</sup> This trend is noticeable in the corpus of analysis reports. Before 1750, half of the analyses included a distillation.<sup>1323</sup> After 1770 however, only ten out of fifty-seven analyses included it. This data is not without bias, but it appears as though distillation was seen as a less reliable technique. A distillation did not provide insights that an evaporation could not give, and there were lingering suspicions that the heat could alter the property of the minerals. One analyst in 1747 expressed his regret at finding out very little from his distillation and conjectured that the procedure had burnt the subtle principles of the water.<sup>1324</sup> Distillation was mostly suited to extracting oils, spirits, and other lighter fluids which were rarely contained in mineral waters. The elastic fluids which analysts hoped to capture through distillation were most of the time too evasive, and the technique of the bladder or the pneumatic machine became more prevalent for this kind of study, making distillations fall out of favour.

### *Vessels of evaporation*

Evaporation was the more popular method of conducting dry analysis. But much like distillation, it required access to a number of tools and vessels, each with its own set of advantages and setbacks. Claude Viel in his study of early modern chemical instruments describes the evaporation vessels as one of the three most important types of instruments in a chemical laboratory.<sup>1325</sup> The largest ones were made of iron, copper or silver. Smaller ones could be made from porcelain, sandstone or glass. Because glass was so fragile, it could not be blown in large vessels, a known issue to the eighteenth-century chemist. Bergman talked about this problem in his guide on water analysis, explaining that while evaporation necessitated large vessels, the choice of material was both essential and always imperfect.

Iron and copper are corroded, and therefore are in general altogether unfit for this purpose : neither is tin convenient : silver, besides being expensive, is sometimes unsafe, especially if there be any uncombined nitrous acid in the

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<sup>1321</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

<sup>1322</sup> Colbert’s orders were to “distillate” the waters of France. There, the term meant “analyse”. Colbert, “Lettres, instructions et mémoires de Colbert, 5, Fortifications, sciences, lettres, beaux-arts, bâtimens, publ. d’après les ordres de l’Empereur.”, 291.

<sup>1323</sup> The few reports I have read from the seventeenth century tended to include it too. Extract from Etienne Borie, *Traité tres necessaire a ceux qui desirent boire les eaux de Vic*, (par Jean Mante D.M. imprimé a Aurillac par Etienne Borie, 1648), recalled in: Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

<sup>1324</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL.

<sup>1325</sup> Viel, “L’évolution du laboratoire et des instruments de chimie vue au travers des ouvrages à planches, du XVIIe à la fin de la première moitié du XIXe siècle.”, 15.

water : vessels made of stone-ware are excellent in many respects, but are liable to two objections; for, first their surface is somewhat rough, hence a part of the residuum may easily be concealed [...]; and secondly, they are soft [...] glass vessels would be the most convenient, if the operations could always be conducted in them without breaking<sup>1326</sup>

Glass was seen as the ideal chemical material, because it did not interact with any substances, but it was of course fragile, and susceptible to breaking in the heat. The difficulties in finding suitable materials led to a lot of tweaking from different analysts.

All of the vessels mentioned by Viel were used in at least one of the analyses of the corpus. Analysts would use vases, capsules, pots, saucers, basins, retorts, alembics, cucurbits and terrines. Those vessels could be made of glass, porcelain, earth, sandstone, iron, copper or silver. Sometimes the analysts would qualify the glass vessels as being “brand new”, or the terrines as being “well-glazed”. The evaporation vessels would be covered with marquees, planks of wood pierced with holes, and other kinds of homemade lids.<sup>1327</sup> One analyst used a bespoke instrument, by gluing strips of paper to his glass cucurbit before placing it on a sand-bath, presumably in order to make the glass less susceptible to breaking.<sup>1328</sup>

The most common vessels were the terrines and the capsules. The former could hold a large volume and were made of earthy materials like sandstone. They were used to evaporate several pounds of water at once. The glazing reduced the sticking of the residue to its sides. The capsules were much smaller, and made of glass or porcelain, which allowed for an easy scraping of residues, and ensured that little of it was lost. In order to combine the best of both techniques, some analysts chose to evaporate a few pints of water at a time in several glass vessels, in order to increase the quantity of residue without sacrificing the quality of the material.

The quantity of water that analysts evaporated varied from one analysis to the next. The reports described evaporating 2, 8, 12, 42, 150 and up to 200 pounds of water, with seemingly no justification. Typically, the more detailed analyses would use larger quantities. The analysts of the beginning of the century were a little less precise in their quantities, and either did not disclose them or used smaller amounts. The quantity of evaporated water depended on the context of the analysis too. Cadet explained in his 1757 analysis that he was unable to perform all of the experiments that he had planned, because too little water had been sent to him.<sup>1329</sup> Analysts who had easy access to the spring however could easily evaporate much larger quantities of water.

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<sup>1326</sup> Bergman, “Physical and Chemical Essays.”, 158.

<sup>1327</sup> The full list of vessels used by the analysts can be seen in Appendix n°[8].

<sup>1328</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL.

<sup>1329</sup> Cadet, “Analyses chimiques des nouvelles eaux minérales de Passy.”, 73–74.

### *Gentle fire*

Once the analyst had gathered the right quantity of water and found a suitable set of vessels in which to evaporate it, all that was needed was a source of heat. One of the most paramount skills needed in the dry analysis was fire management. Mineral waters were fragile and unstable. Evaporating them to dryness was a destructive methodology. In consequence, many steps in the dry analysis consisted in reducing the destructive properties of fire to treat the waters with the delicacy they needed. Since the analysts did not always have the possibility of simply starting over if they accidentally burned the residue, the experiment had to be watched very carefully throughout in order to avoid any ruinous events.

These questions of fire-management were a much older part of the alchemical practice.<sup>1330</sup> In the eighteenth century, an understanding of the different levels of fire was still an important aspect of basic chemical theory.<sup>1331</sup> Fermentation, calcination, evaporation, all of these processes required specific degrees of heat.<sup>1332</sup> Most well-stocked chemical laboratories contained a variety of heat sources.<sup>1333</sup> Some furnaces were designed to provide a gentle heat, others were made to keep substances at the temperature of boiling water or just under, like the distillation apparatus.<sup>1334</sup> In addition, a large chimney was included in order to safely use greater degrees of heat.<sup>1335</sup>

Water analysts borrowed from this rich chemical tradition and made use of the technologies available in order to reduce heat. One of the most popular techniques was to heat the water using a bain-marie. This method was explicitly mentioned eleven times in the reports. The slow heat of a bain-marie was helpful because that it was unlikely to burn a residue. A similarly popular

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<sup>1330</sup> John C. Powers, "Fire Analysis in the Eighteenth Century: Herman Boerhaave and Scepticism about the Elements," *Ambix* 61, no. 4 (2014).; Bruce D. White and Walter W. Woodward, "A Most Exquisite Fellow" — William White and an Atlantic World Perspective on the Seventeenth-Century Chymical Furnace," *Ambix* 54, no. 3 (2013).; Christine Lehman, "Mid-Eighteenth-century Chemistry in France as Seen Through Student Notes from the Courses of Gabriel-François Venel and Guillaume-François Rouelle," *Ambix* 56, no. 2 (2009).

<sup>1331</sup> See the different degrees of chemical fire described by Venel in his article "Feu" in: Diderot, Rond, and Jaucourt, "Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.," Volume VI, Article "Feu, (Chimie.)," 609.

<sup>1332</sup> The furnace had become shorthand for the field of chemistry itself, much like the test tube is representative of the modern-day discipline. "MONSIEUR Guyton de Morveau n'est guère connu que de nos physiciens pour ses opérations chymiques ; mais il ne s'est pas toujours renfermé dans son laboratoire, avec son charbon, ses fourneaux, ses creusets & ses matras." Cited in: Patrice Bret, "Du laboratoire de l'Académie de Dijon à celui de l'École polytechnique : Trente-six ans d'enseignement de la chimie," *Bulletin de la Sabix* (2017), 3–4.

<sup>1333</sup> Christine Lehman, "Les lieux d'activité du chimiste Pierre-Joseph Macquer (1718–1784) : laboratoire et instruments" (Séminaire de la Société de Chimie, Paris, 2017).

<sup>1334</sup> See Boerhaave's furnace in: Marieke M. A. Hendriksen, "Boerhaave's Mineral Chemistry and Its Influence on Eighteenth-Century Pharmacy in the Netherlands and England," *Ambix* 65, no. 4 (2018).

<sup>1335</sup> Viel, "L'évolution du laboratoire et des instruments de chimie vue au travers des ouvrages à planches, du XVIIe à la fin de la première moitié du XIXe siècle.," 8.

technique, brought up on eighteen occasions, was to use a sand bath. Heating a water in a sand bath was almost as slow as the bain-marie, but it provided the advantage of not spreading additional vapours in the laboratory. Besides, though it could heat up quickly, the heat could be regulated by adding or removing sand.

With the bain-marie or the sand-bath techniques, the evaporation was slow. Most of the analysts simply stated that they were using a gentle heat and that the evaporation took an undetermined “long time” to complete. Some were more precise. One analyst recounted that his evaporation using the bain-marie took twenty-five hours.<sup>1336</sup> Another said that his distillation lasted for a total of fourteen days.<sup>1337</sup> This duration was unusually long, but it does show the possibilities that these heating techniques afforded in terms of delicate heating.

The sand bath and the bain-marie were the more popular heating methods, but they were not the only ones available. In rare instances, some analysts used an ash bath instead. One source of heat which had the reputation of being very gentle was simple sunlight. Only one analyst used it to evaporate the entirety of his water.<sup>1338</sup> In all other cases, the sun evaporations were used later in the separation process, to evaporate small quantities of liquids without altering the residue. In these cases, they would put the liquid in a watch glass, and this kind of shallow container would allow for a quicker evaporation.

Some analysts attempted to quantify the heat they were using. Lemaire estimated that the fire he used had a heat of 180 degrees Fahrenheit.<sup>1339</sup> Cadet specified that he used the furnace at the Hôtel des Invalides, which gave a heat of 60 degrees on Réaumur’s thermometer.<sup>1340</sup> Le Veillard estimated a heat of 45 degrees of unspecified scale on his sand-bath.<sup>1341</sup> These are the only instances in which the temperature was so precisely given, which indicates that an exact measurement was not essential. As long as the heat was gentle, its precise degree was irrelevant. One analyst explained for example that he had used the oven of the Hôtel Dieu, which varied in heat, but crucially always remained under the temperature of “lukewarm water”.<sup>1342</sup>

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<sup>1336</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

<sup>1337</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL.

<sup>1338</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.”, 71.

<sup>1339</sup> Lemaire, “Essai analytique sur les eaux de Bussang.”, 24.

<sup>1340</sup> Cadet, “Analyses chimiques des nouvelles eaux minérales de Passy.”, 65.

<sup>1341</sup> The unit of temperature was not specified, but he was most likely using the Réaumur scale, which was most common for French chemists at the time. Analysis of the waters of Montmorency by Veillard, (1777), SRM 113, dossier 1, ASRM.

<sup>1342</sup> Machy, “Examen physique et chimique d’une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 14. “je les plaçai pour procéder à leur évaporation insensible sur le four de notre Hôtel-Dieu, dont la chaleur varie, & qui ne va jamais au dessus de celle qui rend l’eau tiède”.

The end of the dry analysis necessitated the use of intense heat. Calcination, although not the most utilised technique in water analysis, had a place in the determination of the residue. For this, the analysts would either use a crucible, or directly throw the residue onto ardent coals. The earliest mention in my corpus of the use of a “reddened crucible” came in 1756.<sup>1343</sup> The use of calcination appears to have been a staple of the late century analysis, as residue examinations became more precise. In order to increase the heat, some crucibles were filled with coals, or with a mixture of oils and coal.<sup>1344</sup> Linacier mixed his residue with oil before calcination. He also applied it to burning iron and checked the colour of the flame when lighting it on fire.<sup>1345</sup>

Heat was sometimes the cause of accidents. The vessels would at times be too delicate to endure the lengthy periods of sustained heat. The 1721 analyst of the waters of Plombières broke two vessels in a row while trying to get his residue to crystallise. The dryness of these kinds of substances often led the glass to overheat and break.<sup>1346</sup> Chifoliau in 1780 explained that he was not able to evaporate one of the liquors, recounting: “my glass vase broke and my experiment was a miss.”<sup>1347</sup> In his subsequent experiment, he made the evaporation in a silver vase, which fared better.<sup>1348</sup> The crucibles were also susceptible to explosion if they were very overheated. Some analysts described arriving at the laboratory in the morning after leaving a crucible on the fire overnight, to find it shattered all over the fireplace.<sup>1349</sup>

Because of the destructive power of fire, a few analysts expressed doubts regarding the validity of dry analysis. There was a viewpoint in chemistry that stated that heat was a danger to all products, and therefore useless in analytical work.<sup>1350</sup> Occasionally, this kind of discourse would make its way into the reports. Baudry complained about the habit of over-reliance on evaporation,

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<sup>1343</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31–37, AAL. “creuset rougi”. As discussed in Chapter 4, chemistry was still placed under some restrictions regarding experimental apparatus for the first half of the century. It is possible that the avoidance of the crucible in this time had more to do with a need to comply with restrictions, rather than a scientific decision.

<sup>1344</sup> Chifoliau for example used a closed crucible and filled with coals, which would have provided an intense heat. Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>1345</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. A similar method of soaking the sediment in oil before crucible calcination was also used by Chifoliau. Analysis of the waters of Veaugarni by Chifoliau, (1780), SRM 93A, dossier 19, ASRM.

<sup>1346</sup> Calmet, “Traité Historique des Eaux et Bains de Plombières, de Bourbonne, de Luxueil, et de bains.”, 187.

<sup>1347</sup> Analysis of the waters of Veaugarni by Chifoliau, (1780), SRM 93A, dossier 19, ASRM. “mon vase de verre a cassé et mon experience a manqué.”

<sup>1348</sup> Analysis of the waters of Veaugarni by Chifoliau, (1783), SRM 93A, dossier 19, ASRM.

<sup>1349</sup> Charleton, “Three tracts on Bath water.” “In about sixteen days it became so violently hot as to break in pieces a strong earthen pan in which it was kept; it has lain scattered, and smoking on the ground, for some time before the accident was discovered.”

<sup>1350</sup> Rémi Franckowiak, “La chimie du XVIIIe siècle : une question de principes,” *Methodos* 8 (2008).

despite the damages it did to minerals.<sup>1351</sup> Marguery in his analysis refused to subject the residue to calcination or any of the other “fire tortures”.<sup>1352</sup> Though they were not in the majority, most analysts did have some reservations with the use of heat. But instead of dismissing it, they tried to mitigate the problem. They treated the volatile parts of the water separately, as those would be most likely to be altered by fire. They also hoped that any major discrepancy caused by decomposition in the heat would be caught by the other analytical steps. So generally, most analysts tended to agree that fire was to be handled with care, precaution, and a light touch. But few believed that it should be abandoned altogether.

## Identifying and quantifying the residue

The entire process of going from water to isolated and identified residue was complex. In the simplest cases, the analyst would evaporate a large amount of water until a residue was obtained. But in practice, the evaporation was rarely so straightforward. In a number of analyses, especially from the middle of the eighteenth century onwards, the evaporation was interrupted on multiple occasions to perform a variety of tests and collections.

The water was often evaporated until a film formed at the surface. This film was then filtered out and treated separately. In other cases, while the water reduced, it would precipitate different products at different moments. Many analysts took advantage of these staggered precipitations and filtered the water every time a new precipitate appeared. They only let the water evaporate to dryness after all other precipitates and films had been filtered and set aside. These dried filter residues would sometimes be put back in a water solution, and either tasted or tested with reagents, in order to know what substance had just been removed.

The number of filtrations, precipitates, and filtrations that took place during analysis varied so much throughout the century that it is difficult to make a clear temporal argument regarding their use. One of the earliest analyses in the corpus, made in 1718, already used many filtrations. In the end of the period, some analysts listed never-ending successions of filtration and evaporation cycles, while others did not bother at all and evaporated the water to dryness all at once. It is unclear what affected the choice to engage with these additional steps or not. In his analysis, Fourcroy reflected on changes in the evaporation procedure:

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<sup>1351</sup> Baudry, “Traité des eaux minérales de Bourbonne les Bains, contenant une explication metodique sur tous leurs usages.”, 48–1.

<sup>1352</sup> Marguery, “Traité des eaux minérales nouvellement découvertes au village de Passy, près Paris.”, 84. “ces tortures du feu”.

First we evaporated [mineral waters] to dryness, but the separation of the different substances which made up the residues had seemed very difficult [...] it was proposed to separate each substance as it was deposited from the waters [...] This method due to Boulduc was for long put to use [...] [but] we noticed that it was not as exact as we believed [...] Bergman, aided of all of the lights and the practice of experiments, proposed again the old procedure, of evaporating the waters to dryness.<sup>1353</sup>

Fourcroy's description had a distinct progressivist tone, but his assessment was largely accurate. This aspect of the analysis moved back and forth between states of high complexity and returns to simplicity.

The 1721 analysis of Plombières was an example of a simpler version of the dry analysis. The analyst evaporated the waters. A precipitate formed, which was filtered out. The rest of the water was then rendered to dryness. This was a relatively simple process, because it only left two residues to contend with: one after filtration, the other after evaporation.<sup>1354</sup> The 1755 Passy analysis however, while it used the same basic steps, showed an increase in complexity. Venel and Bayen first made two evaporations. In the first, they noticed a film. It was filtered out. The filtered water was put back on the heat. Once partially reduced, it was distilled. The residue was observed, dissolved again, and filtered one more time. The second evaporation was treated similarly. When a deposit appeared, it was filtered out, dried and weighed. The leftover water was reduced, and attempts were made to crystallise it.<sup>1355</sup> The different residues went through many phases of liquid and dry phases, in a process that was altogether much more bespoke and intricate than for the waters of Plombières thirty years before.

The additional steps added during evaporation were made for the purpose of simplifying the separation of the residue. By filtering out a precipitate, the analyst hoped that whatever substance that precipitate was made of would no longer need to be detached from the other minerals in the residue. Those who evaporated the water in one go had to separate all the minerals which were aggregated in a single residue. In both cases, identification of the different

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<sup>1353</sup> Fourcroy and Delaporte, "Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.", 239. "On a cependant beaucoup varié sur la manière de les évaporer [les eaux]. D'abord on les a évaporées jusqu'à siccité, mais la séparation des différentes matières qui composent les résidus ayant paru très-difficile, parce que les procédés chimiques étoient encore incertains à cette époque, on proposa de séparer chaque substance à mesure qu'elle se déposoit des eaux, telles que les terres & les sels les moins solubles qui se précipitent dans le progrès de l'évaporation, & ensuite les divers sels qui y étoient dissous suivant les loix de leur cristallisation. Cette méthode due à Boulduc fut assez long-temps mise en usage [...] on s'aperçut qu'elle n'étoit pas aussi exacte qu'on l'avoit cru [...] Bergman, aidé de toutes les lumières de la pratique des expériences, proposa de nouveau l'ancien procédé, d'évaporer les eaux jusqu'à siccité."

<sup>1354</sup> Calmet, "Traité Historique des Eaux et Bains de Plombières, de Bourbonne, de Luxeuil, et de bains.", 184–188.

<sup>1355</sup> Venel and Bayen, "Analyses chimiques des nouvelles eaux minérales de Passy.", 19.

residues was one of the most crucial and yet difficult parts of the entire analysis.

A residue was typically either a rough crystal or a powder. Some analysts, once they obtained said residue, would simply observe it with the help of a microscope or a magnifying glass.<sup>1356</sup> The shape of the crystals could reveal their chemical nature. Marine salt for example had a clear square structure that was easy to spot with the naked eye.<sup>1357</sup> The analyst of the waters of Barèges gave a detailed description of his microscope investigation of the crystal structure, saying that he saw “crystals formed not exactly in cubes like those of marine salt but in elongated cubes or parallelepipeds”.<sup>1358</sup>

Most of the time however, the minerals were so intricately mixed that they became completely unrecognisable. In that case, they had to be chemically separated before identification could even be attempted. For this purpose, the analysts used a series of solvents.<sup>1359</sup> The dry residue was thoroughly mixed with a chosen liquid, like boiling water or vinegar. The resulting solution contained the solvent and whichever part of the residue was soluble with it.<sup>1360</sup> When they added water for instance, the analysts hoped that all of the saline part of the residue would now be in that water, and out of the dry residue. To make sure that every last part of this saline portion went into the solvent, analysts sometimes ran the extraction several times in a row, to make sure that it was complete. They continued this procedure using different solvents on the residue, until they were left with a number of different liquids each containing only one kind of mineral, and a smaller residue which was soluble in nothing. The different liquids could be tested, or evaporated again, in order to weigh the quantity of each mineral.

This technique of solvent extraction was used in fifty analyses of the corpus. The first instance of solvent use was in the 1718 analysis of the waters of Vic-sur-Cère, which attempted to dissolve the residue using rainwater.<sup>1361</sup>

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<sup>1356</sup> A use of the microscope can be seen in: Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.; Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL.; Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM. The use of the magnifying glass, both times by Laprade, can be seen in: Analysis of the waters of Ambert by Laprade, (ca. 1778), Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL.

<sup>1357</sup> Diderot, Rond, and Jaucourt, “Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.”, Volume III, Article “Chymie ou chimie”, Planche XVII.

<sup>1358</sup> Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9–10, AAL. “je decouvris a la vue simple et mieux ensuite au microscope des cristaux formés non pas tout a fait en cube come ceux du sel marin mais en cubes allongés ou parallelepipedes, je soupçonne que ce sel existe en nature dans les eaux minerales, que la partie de l'eau qui seleve en vapeur jusqua la voute est empreinte de ce sel que ces vapeurs perdant une partie de leur chaleur par le voisinage de l'air extérieur lorsqu'elles passent dans les crevasses de la voute deposite aux bords de ces crevasses le sel qu'elles contenoient”.

<sup>1359</sup> Frederic L. Holmes, “Analysis by Fire and Solvent Extractions: The Metamorphosis of a Tradition,” *Isis* 62, no. 2 (1971).

<sup>1360</sup> This method is called an extraction by solvent and is still used in modern chemistry.

<sup>1361</sup> Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

This was the only solvent used in that case. Different solvents appeared in the analyses around 1750, where a few analysts started to use wine spirit, or alkaline solutions in order to extract certain products out of the residue. It then became more commonplace in the 1770s, especially with the use of distilled vinegar which appeared eight times in the lists of solvents. Water was also common, usually both cold and boiling. Some acids were used for extraction, like nitrous acid, or spirit of vitriol or nitre.

From 1778 onwards, virtually every analysis made use of the solvent technique. The analysis done by Maret in 1781 was particularly thorough on this front, as he used distilled water, boiling distilled water, acetic acid, muriatic acid, nitrous acid and finally vitriolic acid.<sup>1362</sup> The use of this list of solvents persisted until the very end of the period, into the 1800s.

Bergman was celebrated by many chemists for writing a definitive guide to water analysis, and particularly in reference to his suggested method for the use of solvents. His work summarised and highlighted the main difficulties that chemists encountered with this method. While the solvents were in fact quite good at extracting their respective parts of the residue, problems often arose in identifying the exact nature of the salt, or the earth that had just been extracted. This is where Bergman's work was of great use to the French chemist, as he gave a number of ratios that could considerably reduce the time spent identifying the different salts. For example, he measured that 100 parts of gypsum always contained thirty-four parts of pure lime, thus saving others the trouble of having to find the ratio themselves.<sup>1363</sup>

Because of the constant tweaking in the method, it is challenging to present a unifying argument about the state of dry analysis in the eighteenth century. But this complexity was also meaningful. This diversity in methods showed the freedoms that analysts could take. Since these analysts could have widely different educations, it should not be all too surprising that they drew from different chemical traditions. It should however be noted that in the 1770s, indications of increased consensus started to appear. Although no two analysts used carbon copies of the same method, they all more or less agreed on the value of solvent extraction, and the need to be as thorough as possible when separating the residue.

### *The late eighteenth-century emphasis on quantification*

The final step of the dry analysis was the weighing of the different minerals, which when included, served as a summary of the results. Weighing became an important standard at the end of the century, and in the case of reports that were submitted to the *Société*, if no weight measurements were included, this was seen as a major omission, and the report would be deemed unusable.<sup>1364</sup>

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<sup>1362</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM.

<sup>1363</sup> Bergman, "Physical and Chemical Essays.", 165.

<sup>1364</sup> Tore Frängsmyr, J. L. Heilbron, and Robin E. Rider, eds., *The Quantifying Spirit in the Eighteenth Century* (Berkeley, Los Angeles, Oxford: University of California Press, 1990).

Measurements of the weights of residues had been included in chemical analyses since the beginning of the eighteenth century. At that time, they were not an obligatory step. From 1778 and onwards however, the emphasis on the scales grew. Reports started to include a table which gave a visual summary of the different weight measurement. This differentiated early century analyses from later ones. The careful presentation of weights was not limited to printed works but was often included in manuscript analyses too.<sup>1365</sup>

The 1780s were also the time when analysts started to include concentration calculations. While this had not been a priority before, analysts started to give gram per pint calculations of the weight measurements. Maret explained for example that his calculations might be off by a few units, because he had to take some water out of the evaporation in order to perform the reagent analysis, and he hoped that the quantity was small enough to still give a reliable concentration result.<sup>1366</sup>

In the early 1800s, some of the succinct analyses included nothing but this table of concentrations. The quick report on the analysis of the waters of the Aveyron by Caucanas simply said that 18 hectograms of waters had been evaporated, to leave 21 grams of residue, including 4 grams dissolved in the alcohol, 31 grams in cold water, 3 decigrams in boiling water and 3 decigrams had been dissolved by none of the solvents.<sup>1367</sup>

The late interest in weight lists shows that dry analysis and quantitative analysis were not synonymous categories. Only about half of the reports which included an evaporation also included a weight measurement.<sup>1368</sup> One can be led to believe that the entire objective of the dry analysis was to weigh the residue and obtain a concentration measurement for the water. But this reading would be inaccurate for much of the period at hand. The interest in weighing grew with the end of the period. While the analysts from the 1780s and onwards emphasised the quantitative aspects of their work, the dry analysis was also primarily an analytical step, one which was used in combination with others in order to assess what was in the water, and not always how much of it there was.

In both cases, however, whether the different components of the water were quantified or simply named, their presence was described by the reports as factual. Through the combination of the different steps of analysis, the various precautions taken by the analyst, and based on sometimes quoted chemical theory, the analysts were confident enough to make claims about the actual contents of the waters. The inclusion of a table of weights in particular had a way of almost erasing the complexity and the compromises found in the rest

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<sup>1365</sup> See an example of this in: Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288–289, AAL.

<sup>1366</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM.

<sup>1367</sup> Analysis of the waters of the Aveyron by Caucanas, (1802), AJ/16/6697, AN.

<sup>1368</sup> Forty-five out of the eighty-three analyses included a weight measurement of the residue. See Appendix n°[2] on the inclusion of the different steps of analysis.

of the report, to simplify them into a single image of reliability, a statement of fact that could later be used with authority.

### *Mineral water analysis and the 'chemical revolution'*

This notable increase in quantification can easily be tied with a well-researched area of the history of chemistry. The timeline of my study intersects with the years of agitation within chemistry which have been called the 'chemical revolution'.<sup>1369</sup> This much-debated historiographical object refers to a period of time near the end of the eighteenth century, during which chemistry was said to have transitioned away from the theory of the four elements in favour of the onset of modern principles, such as quantification, a unified nomenclature and a larger number of elements.<sup>1370</sup> Important contributions have called into question the term 'revolution', and have been able to see through the transparent attempts by Lavoisier and his allies to paint themselves as the modernists as a way of establishing their own importance in the field.<sup>1371</sup> Others have pointed to wider changes in the field of chemistry that had little to do with the group of the Arsenal chemists.<sup>1372</sup>

Because my study covers both this time period and makes claims regarding the practice of chemistry, it would be natural to wonder whether the 'chemical

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<sup>1369</sup> For a historiographical overview of the 'Chemical Revolution', see: John G. McEvoy, *The Historiography of the Chemical Revolution* (London, New York: Routledge, 2016).

<sup>1370</sup> Victor D. Boantza, *Matter and Method in the Long Chemical Revolution: Laws of Another Order* (Routledge, 2016).; Kim, *Affinity, that Elusive Dream: A Genealogy of the Chemical Revolution.*; Bernadette Bensaude-Vincent, "A founder myth in the history of science? The Lavoisier case," in *Functions and use of disciplinary histories*, ed. Loren Graham, Wolf Lepenies, and Peter Weingart (1983).

<sup>1371</sup> On this, a notable study was conducted by Hasok Chang, who convincingly showed that the chemical theory based on Phlogiston was not epistemically weaker than Lavoisier's caloric-based interpretations. The two were incommensurable, and both had areas of shadows that could not be explained by one another. The idea that Phlogiston was a ridiculous unproven concept, and the emphasis on some of its more "implausible" aspects such as levity, had in fact been pushed by partisans of the new chemistry as a way to establish symbolic dominance rather than genuine explanatory superiority. See: Hasok Chang, "Water: The long road from Aristotelian element to H<sub>2</sub>O," *Circumscribere* 12 (2012).; Chang, *Is water H<sub>2</sub>O? Evidence, Realism and Pluralism.*; Hasok Chang, "The Hidden History of Phlogiston: How Philosophical Failure Can Generate Historiographical Refinement," *Hyle an International Journal for the Philosophy of Chemistry* 16, no. 2 (2010).; Hasok Chang, "We Have Never Been Whiggish (About Phlogiston)," *Centaurus* 51, no. 4 (2009).

<sup>1372</sup> Scholars have highlighted the importance of many overlooked forces in the modernisation of chemistry, such as the crucial role of education, the international collaboration with actors absent from early narratives, and the pressure of industrialisation stimulating the demand for chemical knowledge. See: Thomas Sukopp, "Discoveries of Oxygen and the "Chemical Revolution" in the Context of European Scientific Networks," in *Knowledge Communities in Europe*, ed. B. Schweitzer and Thomas Sukopp (Wiesbaden: Springer, 2018).; John R. R. Christie, "Chemistry Through the 'two Revolutions': Chemical Glasgow and Its Chemical Entrepreneurs, 1760–1860," in *Compound Histories: Materials, Governance and Production, 1760–1840*, ed. Lissa Roberts and Simon Werrett (Brill, 2018).; Perkins, "Chemistry courses, the Parisian chemical world and the chemical revolution, 1770–1790.," C. A. Russell, "Jacob Berzelius, the emergence of his chemical system," *Med Hist.* 26, no. 3 (1982).

revolution' impacted any of these developments. In my own work, despite detailing the different aspects of chemical analysis its evolution in the last decades of the eighteenth century, I have thus far made no mentions of the famed paradigm shift.<sup>1373</sup> Interestingly, it turns out that tracking either the presence or absence of the marks of the 'chemical revolution' in the chemical analysis of water was a rather fruitless endeavour. There is no pertinent argument to be made in this case. Water analysis appears to have simply traversed the changes in chemistry, taken them on, but not participated in the controversy.<sup>1374</sup>

One of the central tenants of the New Chemistry was the abandonment of the concept of Phlogiston, a substance often theorised to be the chemical manifestation of the element Fire, and found in a number of natural products like metals.<sup>1375</sup> As the decades progressed, fewer and fewer analysts used the term, but from the corpus of analyses used in the thesis, there were no comments on the use of Phlogiston, caloric, or any of the controversial terms of the decade. In the same way, while mineral waters were not a central argument used for the change in the nomenclature, a lot of analysts did comply with the new terms.<sup>1376</sup> The growing importance of weighing, and of concluding an analysis with a list of carefully laid out concentration measurements was perhaps the most noticeable effect of the more general changes within chemistry.

Some dynamics often associated with the 'chemical revolution' can also be witnessed in specific analyses. Fourcroy's report in particular emphasised the narrative regarding the uselessness of prior work on mineral waters. He justified why his analysis was done with such care and precision, with the third reason being: "3°. that these analyses of mineral waters are still very imperfect, especially those that have preceded the discoveries of Chemistry on elastic fluids, & which have as their object the waters mineralised by a particular gas, such as the hepatised waters for which Scheele & Bergman have so usefully taken care of."<sup>1377</sup> Fourcroy, a close collaborator of Lavoisier, perpetuated the

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<sup>1373</sup> The 'chemical revolution' was described as a case of a paradigm shift in Thomas Kuhn's seminal work on the subject. Since then, his narrative has been revised. Kuhn, *The Structure of Scientific Revolutions*, 52–65.

<sup>1374</sup> This take on the 'chemical revolution' has also been made in other contexts. Anders Lundgren for example, argues that Swedish chemistry, despite its numerous ties to France around that period, saw very little turmoil during the revolution. Anders Lundgren, "The New Chemistry in Sweden: The Debate That Wasn't," *Osiris* 4 (1988).

<sup>1375</sup> Chang, "The Hidden History of Phlogiston: How Philosophical Failure Can Generate Historiographical Refinement."

<sup>1376</sup> After the events of the 'chemical revolution' and following adoption of the new nomenclature, the reagents were given new names. See the list of reagents in Appendix n°[4]. See also the analyses by Deyeux which uses the new vocabulary throughout: Deyeux, "Analyse des nouvelles eaux minérales de Passy, communiquée à l'école de médecine de Paris." Reagents used: Teinture de tournesol; Muriate de baryte; Noix de galle; Acide oxatique; Muriate de chaux; Nitrate de plomb; Nitrate d'argent; Ammoniac; Eau de chaux; Alkali; Acide nitreux; Acide sulfureux; Acide muriatique; Potasse; Prussiate de potasse.

<sup>1377</sup> Fourcroy and Delaporte, "Analyse chimique de l'eau sulfureuse d'Enghien, pour servir à l'Histoire des Eaux sulfureuses en général.", xii. "3°. que ces analyses des eaux minérales sont

idea that studying the gas present in waters was an entirely new step for water analysis, one that had come from the New Chemistry.

In general, the small world of the chemical revolutionaries, the Lavoisiers, Fourcroy, and Guyton de Morveau, rarely appeared in the world of water analysis. Fourcroy did publish one very detailed work on the waters of Enghien, and its emphatic title “Chemical analysis of the sulphurous water of Enghien, to serve the History of sulphurous Waters in general”, does have the ring of someone trying to also ‘revolutionise’ the field.<sup>1378</sup> In any case, it failed to do so. Fourcroy’s analysis was in many ways a complete outlier of over-precision that was not emulated by his predecessors or successors in analysis.<sup>1379</sup>

One of the most talked-about events of the ‘chemical revolution’ had to do with water, and took place when Lavoisier demonstrated to a crowd that water was no element, and that it could be synthesised from two different airs.<sup>1380</sup> The reason why this experiment did not affect mineral water analysis in any significant way was largely because the framework of understanding of water for these analysts was almost incommensurable with Lavoisier’s. Analysts did not see water as an element, but rather as a solvent, a transportation medium which was closely related to the humours of the human body, and therefore best able to carry remedies to its extremities. Within that framework, it hardly mattered whether water was a single element or not. If it was still able to accomplish the seemingly impossible feat of dissolving metals and other precious remedial substances into fine enough particles, it made little difference.

But although the ‘chemical revolution’ was not tangibly reflected in analysis, chemistry itself was altered by the developments of analysis and its ties to the market of mineral waters. As argued by Bycroft, already in the seventeenth and early eighteenth century, the “consequences [of analysis] for chemistry were considerable. Analyses of mineral waters contributed to the development of colour indicators, the articulation of a new theory of salts, and the rejection of the Aristotelian ideas that air is a single substance and that water can be transformed into earth.”<sup>1381</sup> My own study only confirms this point, and suggests that late eighteenth-century chemical analysis continued and even increased its contributions to the wider field of chemistry.

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encore très-imparfaites, sur-tout celles qui ont précédé les découvertes de la Chimie sur les fluides élastiques, & qui ont pour objet les eaux minéralisées par un gaz particulier, telles que les eaux hépatisées dont Schéèle & Bergman se sont si utilement occupés.”

<sup>1378</sup> Ibid.

<sup>1379</sup> On the reagents front alone, he used forty-eight of them, more than twice the number of reagents than the next individual in the list of most prolific reagent users, who had only used twenty. Ibid; Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

<sup>1380</sup> Bernadette Bensaude-Vincent, *Lavoisier: Mémoires d'une révolution* (Paris: Flammarion, 1993), 469.

<sup>1381</sup> Bycroft, “Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750.”, 3.

Importantly, the chemical analysis of waters gave chemists an object on which to use their talents. Analysis was difficult, but also needed, and sometimes even remunerated. Kim confirms this sentiment in her retelling of the ‘chemical revolution’, stating: “Needless to say, the domain of accomplished analysis grounded chemists’ expertise and identity.”<sup>1382</sup> The methods developed around the chemistry of water in the eighteenth century the solid ground on which general analytical chemistry could be built on.<sup>1383</sup>

## Conclusion

This chapter aims to uncover the process of eighteenth-century mineral water analysis. It outlines its different steps, providing examples from a large corpus of chemical reports in order to outline the increasingly standard practical reality of analysing waters. From this empirical description, several conclusions can be drawn.

The description of each step of the procedure shows the analysts making calculated choices of where to direct their attention. Being overly precise with every single aspect of the analysis was not possible, and arguably pointless. For example, the analysts reached consensus regarding the dangers of using violent fires during the evaporation, and all agreed to using gentle sources of heat. There was however no need to meticulously record the temperature, so approximations were used. Similar dynamics can be seen in virtually all steps. Analysts constantly made compromises. The choice of vessel was never perfect, being either at risk of contamination or breakage. They had to manage the trade-offs of performing the analysis either at the spring or in the laboratory. The former offered pristine quality water, but lesser instruments, and the latter ensured better equipment but presented risks of alterations in the water. There was no perfect way to perform an analysis, short of building a chemical laboratory in each spa town, and reliability therefore had to be constructed in other ways.

The principal instrument of reliability was redundancy of checks, by combining several steps as a way of obtaining converging results. Even within one set of experiments, analysts often multiplied the checks, for example by using several different reagents which were all meant to show the presence of the same substance. The increased redundancy tended to render the entire

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<sup>1382</sup> Kim, *Affinity, that Elusive Dream: A Genealogy of the Chemical Revolution*, 83.

<sup>1383</sup> Patrick Fournier, “Entre technique et politique : les adductions d’eau dans les capitales provinciales en France du xvii<sup>e</sup> au xviii<sup>e</sup> siècle,” *Histoire, économie & société* 35, no. 3 (2016). “Ces travaux utilisent en fait beaucoup de méthodes déjà connues au xvii<sup>e</sup> siècle et exploitées pour l’analyse des eaux minérales grâce à divers réactifs, même si elles sont perfectionnées. En l’occurrence, la différence réside donc moins dans les avancées de la science que dans l’objet auquel s’appliquent les savoirs de la chimie : les eaux utilisées quotidiennement sont désormais susceptibles d’analyses aussi poussées que les eaux minérales recommandées contre diverses pathologies.”

procedure more complex. It also increased the chances of obtaining contradicting results, forcing the analysts to choose between two observations, leading to more compromise.

This detailed investigation of water analysis shows that despite much variation, there emerged already towards the middle of the eighteenth century a standard practice, a kind of recognisable blueprint in the process of mineral water analysis. There were optional steps, but few analysts ordered completely off-menu when it came to the experiments they performed. The main steps were sensory analysis, description of the environment, physical measurements, use of reagents and dry analysis. Each step had its own coherence, internal changes, and caused a number of disagreements as to its efficiency. Not all were consistently applied, but each of these steps were used in more than half of total analyses. In particular, the use of the senses, reagents and evaporations were found throughout almost all reports, and when they were not included, a note was often made of their absence.

This points to the rise of a standard method of chemical analysis towards the end of the century, albeit a non-absolute one. For one, it allowed for a lot of personal tweaking from each analyst, but this individual adapting to the unique qualities of each water was necessary and encouraged. In addition, the standard method made space for innovation, and the inclusion of new methods like air analysis. Thereby, it not only reflected the trends of the chemical field, especially with the increasing controls that came from institutions, but it also pioneered some of the techniques that became ubiquitous of the practice of late eighteenth century chemistry. This 'soft' standard could be used to evaluate the quality of analysis reports, while leaving space for the singular characteristics of each water to be investigated in proprietary ways. Hence it was a standard suitable for the esoteric circle of water analysts to lend their skills to the state-directed efforts to enlighten and control the market of mineral waters.

The commonality of these complex analytical methods reflects the widespread knowledge of chemistry that existed among medical practitioners. It meant that chemical instruments, reagents, manuals, and other necessary supplies had to be available to analysts all over the country.<sup>1384</sup> Since the waters were not always close to urban centres, this created an incentive for instruments to be portable, and provided a clientele for small-town apothecaries. This is testimony to the necessity of having chemical knowledge when working with mineral waters and shows how the popularisation of mineral waters had the capacity of elevating the chemical field with it.

Finally, this chapter makes an argument of absence. Though my study intersects with the 'chemical revolution', chemical analysis was not visibly affected by this controversy. That is not however to say that analysis did not

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<sup>1384</sup> On the diffusion of chemistry manuals, see: Anders Lundgren and Bernadette Bensaude-Vincent, eds., *Communicating Chemistry, Textbooks and Their Audiences 1789–1939* (USA: Science History Publications, 2000).

interact with the wider field of chemistry. On the contrary, water analysis, despite being mostly operated by medical practitioners, brought problems and innovations that were later incorporated in the emerging body of chemical knowledge. The question remains, whether these innovations and the new chemical perspective on mineral waters had an impact outside of the circles of science.

## Chapter 9. Enlightened waters

The term ‘enlightening’ has been used throughout this thesis to describe the process through which mineral waters were transformed by markets, regulation and science. If the previous chapters have shown one thing, it is that none of these processes were ever fully realised. The previous chapter was spent inside the esoteric circle of analysts, studying their method of chemical analysis, the decisions they took, the materials they favoured, the hypotheses they articulated and the compromises they made. Ultimately, I argue that they reached an internal consensus on the methodology, a ‘soft’ standard of analysis. The analysts transformed mineral waters from a natural substance to a list of components. This was, at least in some of the analysts’ minds, the final step of the enlightening process. But although analysis was performed in hope of reaching absolute truth about the nature of mineral waters, it was, as ever, an incomplete process which left many questions unanswered.

In this final chapter, I will examine the consequences of the enlightening process. It never reached the potential that many actors believed it had, because completion was essentially impossible. The mineral waters were never going to be perfectly understood, perfectly regulated and sold fairly and profitably in every part of the kingdom. But despite the process’ lack of completion, it had tangible effects on the perception and handling of mineral waters. Claims were being made about the chemical nature of mineral waters. With the momentum of the mineral water market by the late eighteenth century, the remaining enigma surrounding their composition had little risk of leading to waning interest in the remedies. The mineral water market was here to stay. Rather, I propose that the failure of chemical analysis to meet the overly ambitious objectives of the Enlightenment had the consequence of dividing the consumption and understandings of mineral waters into two branches.

Among analysts, there were diverging opinions as to how useful the results of the analysis were. There was consensus concerning the method, but once the results were obtained, they sometimes failed to explain the effects of the waters. This apparent disconnect created scepticism among analysts. Ironically, these doubts were at times exacerbated by the growing confidence in the analytical method itself. If chemical analysis was as perfect of a procedure as it was claimed to be, why could it not reliably connect the contents of the waters to their effects?

I will begin this chapter from within the esoteric circle of the analysts, by studying the rhetoric with which analysts expressed doubt, and the ways in

which they constructed trust. The goal of this exploration is to explain the effects that both scepticism and confidence had on the uses of waters in the late eighteenth and early nineteenth century. The analysts attempted to construct factual knowledge about mineral waters, but only achieved a partial success. This chapter will therefore examine what happened to those shakily built facts once they left the esoteric circle of analysts.

Two opposite tendencies emerged. The first which I qualify as the rationalist side, manifested principally in the growing adoption of artificial waters as suitable alternatives to natural springs. The second of these tendencies embraced the mystery still present around mineral waters. If mineral waters could not be fully explained, even by the most advanced scientific tools available, it meant that they were potentially exceptional among other remedies. This tendency was manifest in the debate surrounding the concept of ‘universal panacea’. By alluding to the possibility that waters could cure everything, some market actors, as I will show, made the best of the shortcomings of chemical analysis.

## Expressions of doubt in analysis reports

Analysts expressed doubt regarding their results in a manner that extended beyond stating a simple margin of uncertainty. Even modern analytical techniques tend to give results within a range of accuracy. Eighteenth-century analysts feared that despite their best efforts, the results could sometimes be entirely unusable. They therefore voiced varying amounts of scepticism regarding the validity of their results. A closer look at the rhetoric of doubt throughout the eighteenth century reveals that the perceived weaknesses of analysis were not as clear-cut as could appear at first glance.

Part of the explanation for the cautious language lay within tropes of Enlightenment rhetoric. Stating one’s humility was part of the expected prose of scientific texts. Dufau gave an example of this in his analysis of the waters of Barbotan. When trying to assess which type of sulphur was present in the waters, he marked his hesitancy: “Is it a sulphurous spirituous acid? Is it a sulphur in substance or an hepar sulphuris [?]” In the end, he admitted that he could only “propose conjectures but always with this modesty which inspires rational doubt”.<sup>1385</sup> This “rational doubt” was a scientific virtue, stated here in order to avoid criticisms of unsubstantiated claims.

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<sup>1385</sup> Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM. “Est ce un esprit sulphureux acide ? Est ce un souffre en substance ou un hepar sulphuris netant presque pas possible de donner des notions precises et certaines sur la nature de ces [illisible] singuliers et incoercibles qui constitue le mineral des eaux de Barbotan. je ne puis que proposer des conjectures mais toujours avec cette modestie qui inspire le doute rationnel. je presume que les vapeurs sulphureuses qui se font distinctement remarquer dans nos Eaux sont, non un souffre formel mais des vapeurs parfaitement analogues a celles qui se degagent de foye de souffre ou

A stronger expression of doubt was given by Carrère, in the introduction of his catalogue on French mineral waters. He stated: “there are few subjects on which one has written so much; yet we know the principles [that waters] contain & the effects they produce no better.”<sup>1386</sup> This statement had a different purpose to Dufau’s. Carrère in this instance was putting his name on a vast compilation of treatises on mineral waters. He likely knew that not all of them would have been endorsed by his modern analytical standards. He therefore placed this caveat at the beginning, as a way of encouraging scepticism in his reader, and perhaps to avoid pushback on his choice to include questionable analyses.

In other instances, the expressions of doubt conveyed what appears to have been sincere worry. Méglin in his report, sounded anxious at the possibility of being attacked by his peers if they were to find errors in his method. He talked at length about his willingness to forgive his predecessors’ inaccuracies, hoping that the same clemency would be extended to him in return: “As tolerant for others, as I would want others be towards me, I believe that most often I ought to attribute the differences between these analyses to the changes, of which the water [...] can be susceptible to.”<sup>1387</sup> One might wonder what the point of chemical analysis would be, if any discrepancy between results of two different analysts could be explained by the changing nature of the waters themselves. But in a sense, this was the objective of the rhetoric. Méglin, upon reading the wildly different conclusions of his predecessors, preferred to put the blame on the water’s instability, and on his own experimental errors, rather than on the capacities of analysis in general.

Other expressions of doubt were directly pointed at the chemical method. The book by Vitet, a man who according to the cover, “used to be a professor of Chymistry”, warned his readers against the arrogant confidence that could be placed in analysis. He asserted that “chemical analysis is as uncertain a way to judge the virtues of mineral waters, as it is to establish those of vegetals & animals.”<sup>1388</sup> He also went against the grain of his contemporaries by adding that the sensory tools, such as taste, smell and observation, were unable to

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le principe phlogistique pour qui sechappe du souffre laisse en arriere son aide qui devenu libre sunit avec lintermede qui fournit ly devant le foye de souffre:”

<sup>1386</sup> Carrère, “Catalogue raisonné des ouvrages qui ont été publiés sur les eaux minérales en général et sur celles de la France en particulier, avec une notice de toutes les eaux minérales de ce royaume.”, 1. “Aussi y a-t-il peu de sujets sur lesquels on ait tant écrit ; mais nous n’en connoissons pas mieux les principes qu’elles contiennent & les effets qu’elles produisent.”

<sup>1387</sup> Méglin, “Analyse des eaux minérales de Sultzmat en Haute Alsace.”, 2. “Aussi tollérant pour les autres, que je voudrois qu’on le fut pour moi, je crois devoir attribuer le plus souvent les différences de ces analyses aux changemens, dont l’eau, qui en a fait l’objet, peut être susceptible.”

<sup>1388</sup> Vitet, “Pharmacopée de Lyon ou exposition méthodique des médicaments simples et composés, de leurs caracteres, de leurs vertus, de leur préparation & administation, & des especes de maladies où ils sont indiqués,” (Chez les Freres Perisse, Imprimeurs-Libraires, rue Mercier, 1778), v. “45. L’analyse chymique est un moyen aussi incertain pour juger des vertus des eaux minérales, que pour établir celles des végétaux & des animaux.”

detect real from fake waters.<sup>1389</sup> Given the widespread approval of these techniques, it is safe to assume that Vitet was perhaps more sceptical than the norm.<sup>1390</sup>

These kinds of pointed critiques became more commonplace towards the very end of the century. In 1787, Gastellier explained that “the way of analysis is not as sure as one imagines; often the effect of this analysis is to develop this or that principle which is not at all contained in these Waters.”<sup>1391</sup> This statement was hardly ambiguous, and likely not written for the sake of appearing humble. Later still, these critiques alluded to the capacities of chemistry at large. In the report on a succinct analysis of the waters of Lauben, the reviewer stated despite the extended knowledge of chemistry, it was still “not always sufficient to be able to judge with a mathematical precision the state of the substances which are mingled in them by the act of underground combinations”.<sup>1392</sup> If “mathematical precision” was the new benchmark for chemistry, analysis could not yet deliver such accuracy.

Two years following this, a report to the ministry lamented the poor quality of the works done thus far on the mineral waters of Bonnes. The report complained that upon reading the works written on these waters: “we soon notice the ignorance, the prejudices, the views of self-interest, the poorly done observations and other motives of this sort which have contributed to keeping up the Error in which we remain”.<sup>1393</sup> According to this author, analysis was not only victim to scientific blunders, but it was also swayed by the weakness of

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<sup>1389</sup> Ibid, “48. Ne vous flattez pas de distinguer d'une maniere évidente les eaux minérales factices, des eaux minérales naturelles ; la saveur, la couleur, la transparence & même l'odeur, n'offrent pas des difficultés insurmontables pour la contrefaction.”

<sup>1390</sup> Vitet seems to have held a general distrust in the stability of waters. He also suggested that filtered river water could be best for pharmaceutical applications, as for drinking.

<sup>1391</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. “la voye de l'analyse n'est pas aussy sure qu'on l'imagine; souvent l'effet de cette analyse est de developper tel ou tel principe qui n'est point dutout contenu dans ces Eaux.”

<sup>1392</sup> Deyeux, “Rapport de la Commission nommée par le comité de chimie de la Société pour l'encouragement des arts de Genève pour l'analyse des eaux thermales de Lauben”, (Thermidor 10<sup>th</sup> An X), AJ/16/6697, AN. “quel qui Etendu, dit-il, que la chimie moderne ait donnée aux moyens de Direction dans les différentes recherches analytiques sur les Eaux minerales, on convient encore qu'ils ne suffisent pas toujours pour qu'on puisse prononcer avec une précision mathématique sur l'état des substances qui s'y trouvent confonduës par l'acte des combinaisons souterraines ; les difficultés sont encore telles dans certaines circonstances, qu'il est presque impossible d'assigner les vraies causes des modifications que quelques unes d'entre elles paroissent éprouver et qui sont néanmoins assés puissantes pour alterer plus où moins les caracteres extérieurs sous les quels elles ont coutume de paroître lorsqu'on les traite isolement avec des agents chimiques”.

<sup>1393</sup> Deyeux, “Rapport sur une lettre du ministre de l'intérieur relative aux Eaux de Bonnes”, (19<sup>th</sup> Pluviose An XII), AJ/16/ 6698, AN. “D'après tout ce qui a été dit et publié sur les Eaux de Bonnes a différentes époques on serait d'abord tente de croire que la nature leur a donné des propriétés qu'on chercherait inutilement dans d'autres remèdes; mais lorsqu'on examine avec soin tous les ouvrages ou les propriétés dont il s'agit sont consignées, on s'aperçoit bientôt que l'ignorance, des préjugés, des vues d'intérêt, des observations mal faites et d'autres motifs de cette espèce ont contribué à entretenir l'Erreur dans laquelle on est encore sur les vertus sans nombre attribués aux eaux dont il s'agit”.

analysts themselves, who were not able to put personal prejudice aside when conducting experiments.

The discourse of caution that accompanied the writings of chemists was often complemented by mentions of the place of chemistry in regard to the wonders of the nature. An allusion to the possibility of making mineral waters artificially appeared in the 1723 report on the waters of Passy by Marguery. It was only in passing, but his preface stated that naturally ferruginous waters were much superior to artificially ferruginous ones.<sup>1394</sup> Laprade claimed in his 1778 analysis that “Experience has proved that the salts and the [illegible] produce good effects, because everything which is prepared by nature, is always above the art.”<sup>1395</sup> The same year, La Martinière complained about the uselessness of iron filings, and like Marguery, claimed the superiority of natural iron on its manmade replacement.<sup>1396</sup> These allusions often referred to the complexity of natural solutions. While an artificial dissolution of iron would theoretically contain nothing but water and iron, nature had a way of evading analysis by mixing a large number of different substances, in a wide “underground laboratory”, which made life difficult for chemists, but was often described as the reason for the efficacy of the waters.<sup>1397</sup> This idea of the superiority of naturally-derived products was used as an explanation as to why laboratory chemistry could not perfectly imitate the transformations that occurred in nature.

### *A crisis of faith?*

The increasing frequency of these expressions of doubt around the turn of the century presents the hallmarks of a crisis of faith in analytical chemistry. This conclusion would be supported by the oft-cited work of Christopher Hamlin on the subject. He claims that the late eighteenth century was characterised by high confidence in analysis, a moment in time during which chemists believed analysis could essentially uncover any secret. Hamlin then argues that this confidence came crashing down in the early nineteenth century.<sup>1398</sup> In response, the physician and chemist John Murray attempted to modernise chemical analysis, but his proposed solution was an unsatisfactory middle ground. On one hand, the chemists of the early nineteenth century agreed with Murray's criticisms of chemical analysis, but they were also “hesitant to adopt his

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<sup>1394</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, preface.

<sup>1395</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL. “L'expérience a prouvé que les sels et le [illisible] produisoient de bons effets, parce que tout ce qui est préparé par la nature, est toujours au dessus de l'art.”

<sup>1396</sup> Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM.

<sup>1397</sup> Analysis of the waters of Pouët by Gallot, (1784), SRM 91A, dossier 13, ASRM. “laboratoires souterrains” de la nature.

<sup>1398</sup> The section concerning this crisis is aptly titled “Murray's Answer: The Triumph of Skepticism”. Hamlin, *A Science of Impurity, water analysis in nineteenth century Britain*, 30.

alternatives.” The alternatives in question were not practically applicable to the needs of the market of waters. For that reason, “Murray’s attack on certainty in water analysis left chemical analysis far short of the degree of definitiveness expected of it, by chemists as well as their clients. Like Berthollet’s chemistry on which it was based, Murray’s water analysis exposed the flaws of conventional views but was unable to provide any satisfactory alternative.”<sup>1399</sup>

Based on the findings of my study, I would propose a nuancing of Hamlin’s view. For one, he claims that the period of high confidence in the analytical method occurred in the 1770s and 80s, around the publication of Bergman’s treatise on mineral waters. But as showed by the above-cited examples, scepticism in analytical capacities was already present in those decades. Doubt was always a part of chemistry in the formative years of the eighteenth century. It is to be expected that a moment of turmoil in the discipline in the early nineteenth century temporarily accented the incertitude in the methods of analysis that had been fostered for decades. The crisis described by Hamlin is less pronounced when viewed in this light. Besides, though some analysts did critique the method itself, much of the mystery around mineral waters came from their applications, and from the struggle to connect the composition of a water to its remedial effects.

## The perplexing origins of the waters’ effects

The ultimate goal of the scientific exploration of mineral waters was to improve their medical applications. Most analysis reports stated as much. They hoped that a carefully laid out list of components would later lead to a clearer understanding of how the waters interacted with physiology, and which diseases they were best suited to cure. That being said, most analysts recognised that science had not yet reached that point. The analysis and the medical effects of waters were not fully connected, and in the attempts at understanding and prescribing mineral waters accurately, most physicians adopted a more environmental view, one that placed mineral springs within a wider natural system which led to the process of healing when taken in its entirety.

### *Conceptualising mineral waters as a component of a broader medicinal system*

As seen in the previous chapter, most analysis reports included a description of the surroundings of the spring. The environment, the beauty of the views, and in the cases where they were available, the local recreations, were

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<sup>1399</sup> Ibid, 36. Chapter 2, “The Most Difficult Operation in Chemistry: The Analysis of Mineral Waters”.

described as part of the alleviative efforts.<sup>1400</sup> Some reports also specified whether or not the waters were good for cooking vegetables or washing clothes with.<sup>1401</sup> This environmental conception can be seen in the report on the waters of Quercy, which combined praise of the waters with appreciation of the honesty, sincerity, and lack of greed of the locals, implying they were connected.<sup>1402</sup>

The quality of the air was often mentioned as working in tandem with the waters.<sup>1403</sup> The earliest such mention was made in 1756 regarding the waters of Bugey, stating that the township was renowned for the breathability of the air, the quality of the produce, and the virtuous character of the inhabitants.<sup>1404</sup> The comments on air quality only increased towards the end of the century.<sup>1405</sup> In the case of the waters of Ambert, the quality of the air was described as an edge this particular source had on its competitors, stating that good air was not always found near springs, and that such serendipity should be taken advantage of.<sup>1406</sup> In an opposite example, the analyst of the waters of Donzy admitted that the waters had been under-appreciated because of the great poverty of the region and the unpleasant environment and stagnant pools which tended to cause fever epidemics in the region.<sup>1407</sup>

In addition, most physicians agreed on the importance of the rituals and habits which accompanied the consumption of waters. When visiting a spa, the days were typically regulated by physicians or intendants. They ordered an early rising, and then commanded the visitors to drink and eat at set hours.

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<sup>1400</sup> This was especially true outside of France, in the larger and highly frequented spas, which had a range of luxury accommodation, care and distraction to offer their visitors. In the more austere French spas, the recreations offered were often simple and free, like taking walks or engaging in conversation at the fountain. On the use of recreation in therapeutic efforts in Britain, see: Cossic and Dachez, *La sociabilité en France et en Grande Bretagne au siècle des Lumières*.; Cossic, *Bath au XVIIIe siècle : les fastes d'une cité palladienne*. In primary literature on Bath, see: Cheyne, "An essay of the true nature and due method of treating the gout : written for the use of Richard Tennison, Esq. : together with an account of the nature and quality of Bath-waters, the manner of using them, and the diseases to which they are proper : as also, of the nature and cure of most chronical distempers : not publish'd before." On the French spas and their lack of recreation, see Chapter 1.

<sup>1401</sup> An example can be seen in: Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM.

<sup>1402</sup> Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM. "quoique patriote je nexagere ren les habitans de ce fortuné éloigné des grandes villes nen ont pas encore contracté les vices, ils ont les qualités de l'homme primitif, cest a dire quilz sont honnettes, sinceres, et desinteressés".

<sup>1403</sup> Seven analyses of the corpus made explicit mentions of the quality of the air.

<sup>1404</sup> Analysis of the waters of Bugey, (1756), Ms pa 206, f31-37, AAL.

<sup>1405</sup> Analysis of the waters of Orliénas by Lanoix, (1778), Ms 120, f203-206, AAL.; Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM.; Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM.

<sup>1406</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50-53, AAL.

<sup>1407</sup> This problem was bad enough to have caused the loss of large swaths of the population to disease and abandon. Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM.

They also prescribed a host of other therapeutic practices, such as walks, and other light physical activities, purges, blood lettings etc. Physicians also prescribed a specific diet that had to be followed during the cure. This diet often included the restriction around certain kinds of meats, or liquors. The physician writing about the waters of Vallers in 1777 prescribed that the patients drink the waters slowly: “I recommend to them as the most essential thing not to swallow a Chopine [half pint] in one go”. He added that dinner should consist of a piece of bread dipped in a good white wine.<sup>1408</sup> In a treatise on the best uses of the waters of Spa, the author expressed how the Dutch, who often visited Spa, were a very unhealthy people because of their constant drinking of tea and coffee. He suggested however that mixing the waters with wine was perfectly acceptable. He recommended a complete ban on tea or coffee but tolerated hot chocolate for those who could digest it well.<sup>1409</sup> These dietary prescriptions endured throughout the entire eighteenth century and into the first decade of the nineteenth century.<sup>1410</sup>

Some physicians gave further recommendations regarding the best manner of taking the waters. The physician writing on the waters of Vallers expressed that it was best to be dressed warmly throughout the stay, and to avoid brutal interruptions of the cure. Other physicians made unusual recommendations, like Marsonnat who, alongside typical prescriptions of good and moderate diet, said that it would be best to only drink the waters that had been bottled while the wind blew northwards.<sup>1411</sup> These suggestions all aimed at eliminating unhealthy behaviour from the patient, to give the waters a chance to take effect.<sup>1412</sup>

The emphasis on diet and obedience to the counsel of physicians was sometimes given as the reason why patients did not recover. Though a useful

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<sup>1408</sup> Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM. “je leur recommande comme la chose la plus essentielle de n'en pas avaler une Chopine a la fois, comme cela se pratique a la plupart des fontaines ou il n'y a point de Medecin Directeur.” A “chopine” corresponds to half a pint. See Appendix n°[10] on eighteenth-century units.

<sup>1409</sup> “Traité de l'utilité des eaux Minérales et des bains de Spa”, (ca. 1808), F/14/1309, AN.

<sup>1410</sup> Esquirou spoke at length of the diet to follow alongside the cure: Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.; Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM. Fourcy claimed that those who were not cured had not followed their prescribed diet: Fourcy, “Analyse des eaux alkalino-martiales de Trye-le-Chateau avec l'exposition de leurs propriétés faite par M. Fourcy, Faite sous les yeux de M. Raulin.”, 33–34. Gastellier explained that the waters of Noyers had to be taken alongside a proper diet, just like any other mineral water: Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM. The prospective inspector of the waters of Lamalou mentioned the utility of having a physician on hand to recommend the appropriate diet: Report on the application for the position of inspector at the waters of Lamalou, (1806), AJ/16/930/A, n°519, AN.; Finally, a memoir on the waters of Bagnères also mentioned the importance of having an appropriate diet alongside the cure. “Mémoire sur les différentes maladies soignées par les eaux de Bagnères de Luchon”, (1811), AJ/16/6697, AN.

<sup>1411</sup> Marsonnat, “Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais.”

<sup>1412</sup> Report by Deyeux on the questions made to the minister on the administration of mineral waters, (An X), AJ/16/6698, AN.

argument for spas towns to explain why some people still died at the springs, it had the consequence of muddling the origin of the water's effects. It was not entirely clear whether the cure came from the mineral waters, the diet, or a combination of both.<sup>1413</sup>

It should also be said that celebrating the system within which a water could be found, and the necessity of appreciating the air or the surroundings for a better cure was not always done out of disinterested medical opinion. Spa town physicians wanted patients to travel to the spring, and incentivised visits by singing the praises of the local region when they could. This was sometimes admitted directly, as with the 1736 example of a treatise on the waters of Bourbonne. The author took care to explain that he would remain concise when describing the many qualities of the location, the hospitality of the locals, among other positive attributes: "It is only the Mineral Waters which make Bourbonne what it is".<sup>1414</sup> By doing this, he was both implicitly accusing other authors of over-selling the quality of their establishments to the detriment of the waters, while still making a mention of the quality of Bourbonne's own facilities.

#### *The issue of edge cases: the non-mineral healing waters*

The complexities surrounding the official definition of mineral waters played a role in obscuring the origin of the water's effects. Most definitions centred on sensory experience and on the presence of remedial applications. But an example from 1776 shows just how loose the boundaries of what constituted a mineral water could be. Cadet made the analysis of the waters of Saint Martin. The procedure was typical: he described the environment, tasted the waters, used eight different reagents and evaporated eight pounds of water before treating their residue. What he found confounded him. The waters contained a very small amount of minerals, and yet, they were known to have positive effects on health. He explained that theory was a lesser informant than experience in such cases, and that the observations of cures therefore represented the more trustworthy source.<sup>1415</sup> He supplemented the analysis with a number of medical certificates, such as the example of a woman with infertility issues who was able to become pregnant after visiting the spring.

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<sup>1413</sup> This environmental approach to healing was not out of place in the eighteenth century. Many other kinds of remedies were thought as effective only when part of a wider set of rituals. On this, see: Sophie Vasset, *Décrire, Prescrire, Guérir : Médecine et fiction dans la Grande-Bretagne du XVIIIe siècle* (Québec: Presses de l'Université de Laval, Éditions du CIERL, 2011).

<sup>1414</sup> Baudry, "Traité des eaux minérales de Bourbonne les Bains, contenant une explication méthodique sur tous leurs usages.", description. "Ce sont uniquement les Eaux Minérales qui font Bourbonne ce qu'il est, par rapport à elles ; c'est où s'adresse leur première sortie, c'est par-là qu'il faut les faire connoître."

<sup>1415</sup> Analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM. "Ce n'est point à la théorie, c'est à l'expérience à prononcer sur ce point".

Cadet then provided theories on why low mineralisation might still lead to cures. He noted for example that the water of the Seine river tended to purge foreigners, as in, people who were not used to drinking it every day. This suggested that even waters with barely perceptible mineralisation – like river water – could have effects on the human body. He added the corroborating evidence of an analysis of the waters of Fontainebleau made by Lassone, in which chemistry could unveil no minerals, despite continued medical effects.

His analysis was well-received, and a note written by an Associate at the *Société* confirmed that sometimes, waters had effects despite the results of the analysis suggesting they contained almost no noteworthy minerals.<sup>1416</sup> The ensuing deliberation recognised the waters as healthy [*salubres*], but not mineral, and gave the distribution rights to Chevrier, fixing their price at the inexpensive 2½ a pint.<sup>1417</sup>

In 1783, a relative of the authorised distributor asked if his permit could be renewed. A note signed by Cornette, Fourcroy and Carrère stated in response that since Cadet had declared the waters not to be mineral in 1776, they were no longer under the legislation of the *Société*, and that it was outside of their jurisdiction to grant such a permit. This was convenient enough for the distributor, who therefore took it upon himself to simply distribute the waters without oversight. A few years later, his waters came to be sold in Paris.<sup>1418</sup> Arnaud, the distributor of mineral waters, was unhappy with this arrangement which cost him potential clients. He gained sympathy from the Paris intendant who wrote to Lassone in order to have the distribution forbidden, despite those waters not being classified as mineral waters.

These events show the extent to which mineral waters were caught between institutional power, economic interests, and scientific appraisal. The waters of Saint Martin had been, according to the *Société's* rule, analysed adequately. They were declared not to be mineral based on precise experimentation. But evidently, this had few if any repercussions on the clientele of the waters. If the distributor was seemingly unfazed and still eager to sell in the capital, there must have been a market for his waters. The jurisdiction void created by their status as non-mineral was simply a convenient way to facilitate business, one that the seller of officially recognised mineral waters, was not happy about.

A similar case occurred with the analysis of the waters of Saint Santin by La Martinière, who was just as surprised with the small quantity of minerals found as a result of his chemical analysis. He said on this:

My surprise is extreme, each time that I compare the modest quantity of substances which are contained in most mineral waters, with the Effects they

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<sup>1416</sup> Note by a *Société* reviewer on the analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM.

<sup>1417</sup> Copy of the deliberation of the *Commission*, (1777), SRM 92 B, dossier 39, ASRM.

<sup>1418</sup> Correspondence from the intendant in Paris to Lassone, (1788), SRM 92 B, dossier 39, pièce 7, ASRM.

produce. Those of St Santin are among these. I have found, it is true, some variety in the product of several evaporations: but in the end these differences are always not very noticeable. The enlightened experience, of more than a century has however noted their utility in the derangements of digestion [etc].<sup>1419</sup>

The medical theory as to how mineral waters worked was not entirely settled. Some analysts suspected that the positive effects of mineral waters might have more to do with the water itself than with the minerals. In 1781, Maret wrote about the waters of Sainte Reine, and exclaimed his doubts regarding their physiological action. He described the ways in which waters were often used to treat certain skin inflammations, despite the composition of the water suggesting nothing of the sort. He proposed that perhaps, it was the water that helped with the condition, not its minerals.<sup>1420</sup> This idea was shared by others.<sup>1421</sup> In the analysis of the waters of Sainte Reine, Doucet talked at length about the benefits of common water in the restoration of health. He described water as being an excellent solvent, which had positive effects on overheated humours.<sup>1422</sup>

#### *Addressing the persistent gap between chemical analysis and medical applications*

The lack of clear scientific laws governing the medical effects of mineral waters suggests that the intense scepticism felt by early nineteenth century analysts came from a doubt that analysis could be connected to medical properties. A report summarising the state of affairs at the popular spa town of the Mont d'Or in 1816, exemplified this:

There is for sure something more in the thermal waters, than what we have found in them until now. Of the principles they contain, those which can be counted, measured and weighed, hardly suffice for the explanation of their

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<sup>1419</sup> Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM. "Ma surprise est extrême, toutes les fois que je compare la modique quantité des substances que contiennent la plupart des eaux minérales, avec les Effets démontrés qu'elles produisent. Celles de St Santin sont de ce nombre. j'ay trouvé, il est vrai, des variétés dans le produit de plusieurs évaporations : mais enfin en différences sont toujours peu considérables. Une expérience éclairée, de plus d'un siècle en a cependant constaté l'utilité dans le dérangement des digestions [etc]."

<sup>1420</sup> Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM.

<sup>1421</sup> See: Chaplin, "Why Drink Water? Diet, Materialisms, and British Imperialism." Chaplin argues that drinking common water became part of the accepted healthy diet in the late eighteenth and early nineteenth centuries. There were examples of the celebration of common water in much earlier periods, they simply were not as widely accepted. See for example, a 1623 treatise translated and republished during the eighteenth century on several occasion: John Smith, "Traité des vertus medicinales de l'eau commune... Par M. Smith. Et le Grand Febrifuge du Docteur Hancock. Traduit de l'Anglois (par P. Noguez). On y a ajouté les Theses de Messieurs Hecquet et Geoffroy, avec quelques Réflexions sur le Remede de l'Eau à la glace," (Ches Guillaume Cavalier fils, rue S. Jacques, près la Fontaine S. Severin au Lys d'Or, 1626).

<sup>1422</sup> Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

effects: everything leads to presume that these effects belong in great part to imponderable and incoercible agents<sup>1423</sup>

This passage highlights the dilemma that analysts were faced with. This report did not question the very existence of chemical components, those that could be “counted, measured and weighed”. It simply tried to make sense of the disconnect between those identifiable principles and the seemingly more complex and irregular medical effects of the waters. He therefore conjectured that the waters must contain something more, a mystery “imponderable and incoercible” matter, inaccessible to chemistry, which filled the gap between analysis and observed effects.

Since medical effects were even more difficult to settle than chemical composition, many analysts preached the importance of empirical knowledge. In a letter accompanying his analysis of the waters of Pouillon, Massie exclaimed that the ‘principles’, meaning the chemical components, were only one facet of mineral waters.<sup>1424</sup> Analysts sometimes expressed regret at the lack of access to empirical accounts of the water’s effects. Cuel explained that the waters of Vots Douvse he just analysed had never been prescribed before, so the only data in his possession was the chemical analysis, and the positive effects on the single patient whom he cured by prescribing the waters.<sup>1425</sup>

Regnault had an original method for countering the uncertainties of chemical analysis. He suggested that the effects of each mineral found in the water should be appraised individually, in order to get a sense of how they might work in combination. He took his own advice and dedicated numerous pages to describing the known effects of each principle that his analysis had uncovered, both individually and in combination.<sup>1426</sup> This method showed an attempt at systematically linking composition and effects, but its rarity suggests that this was not widely recognised as valid.

In the 1780s, stating that experience was the best teacher of the principles of the mineral waters became almost a trope itself, or just a rhetorical form used to introduce a discussion on medicine. The apothecary Apoux gave a typical example of this by saying “Several celebrated Chemists have confirmed by the way of analysis that the mineral water [...] is similar to that of Provins, & Experience, which is the best judge in such cases, has proved by a usage of

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<sup>1423</sup> Report on the waters of the Mont d’Or, (1816), AJ/16/6697, AN. “L’analyse des eaux, si elle n’existe pas, ou si on la croit inexacte ou incomplète, pourrait être une introduction obligée à ce traité. Il y a assurément quelque chose de plus dans les eaux thermales, que ce qu’on y a trouvé jusqu’à présent. Des principes qu’elles contiennent, ceux qui se comptent, se mesurent et se pèsent, suffisent bien peu à l’explication de leurs effets : tout porte à présumer que ces effets appartiennent en grande partie à des agens impondérables et incoercibles qui se livreront à des recherches opiniâtres et bien entendues un pareil travail ne serait ni sans fruit ni sans honneur.”

<sup>1424</sup> Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

<sup>1425</sup> Analysis of the waters of Vots Douvse by Cuel, (1780), SRM 90 A, dossier 7, ASRM.

<sup>1426</sup> Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM.

16 years that their virtues are the same.”<sup>1427</sup> The statement linked medical and chemical approaches, as a way to reach a ‘best of both worlds’ solution. This affirmation could also be found in the 1789 analysis of the waters of Charbonnières, which said: “The best analysis that one can do of mineral waters, is the cures they provide, common sense needs no other proofs; experience is the master of the arts.”<sup>1428</sup>

No analyst denied the importance of empirical knowledge. But when they had no observed cures to talk about, they occasionally ventured in the difficult task of matching chemical principles to medical effects. The analyst of the waters of Pouzaugues explained that since the waters were not used, he could not report on their effects, but based on the analysis, he guessed that they should have analogous effects to the waters of Pouët.<sup>1429</sup> This kind of remark showed that some conjectures of the medical properties could be inferred from water analysis. Souquet used the same deduction, by explaining that the waters of Recques had not been prescribed yet, but based on their principles, it was clear that they were tonic. From that assumption, he felt confident enough in his analysis to give a list of medical conditions that could potentially be cured by the waters, despite never having seen them work.<sup>1430</sup>

In one of the documents from the first decade of the nineteenth century, where otherwise much doubt was displayed, the authors explained that experience was the best way of knowing the medical applications of a waters. But despite their flaws, the results of chemical analysis could give a few indications, even if they did so in a way that was “approximative”.<sup>1431</sup>

All of these passages showed an attempt by analysts at reconciling the methods of their dual expertise, in both chemistry and medicine. The two ways of assessing the waters were not irreconcilable, but they were not quite compatible either. Many physicians had prescribed the waters for decades without having the faintest idea of their exact composition, so connecting a precise knowledge of that composition to the medical practice was at times a little forced. The analysts themselves did not appear to always have a fully developed theory of how chemistry could be connected to medicine. Their attempts at making connections do however suggest that they believed it to be possible on some level.

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<sup>1427</sup> Correspondence from Apoix to the *Société*, (1780–1787), SRM 91B, dossier 19, ASRM. “Plusieurs Chimistes célèbres ont confirmé par la voye de l’analyse que l’eau minerale que forment les sels, ressembloit absolument a celle de Provins & l’Expérience, qui est le meilleur juge en pareil cas, a prouvé par un usage de 16 ans que les vertues etoient les mêmes.”

<sup>1428</sup> Marsonnat, “Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais.” “La meilleure analyse qu’on puisse faire des eaux minérales, est les guérisons qu’elles procurent, l’évidence n’a pas besoin d’autres preuves; l’expérience est la maîtresse des arts.”

<sup>1429</sup> Analysis of the waters of Pouzaugues by Gallot, (1784), SRM 91A, dossier 13, ASRM.

<sup>1430</sup> Analysis of the waters of Recques by Souquet, (1786), SRM 91B, dossier 22, ASRM.

<sup>1431</sup> Analysis of the waters of Mammont by Chaussier and Deyeux, (1809), AJ/16/6698, AN. “d’une maniere approximative”.

## Building layers of trust

Faced with the lasting difficulties in pinning down the exact effects of mineral waters, stating the need to multiply observations, to combine approaches, and to remain humble in the face of changing results was not an empty exercise. Rather, it became a critical component of a process by which analysts convinced others of their reliability. As is often the case in the elaboration of scientific tests, establishing proof cannot be done by a single operation.<sup>1432</sup> Taken in isolation, the education of the analyst, the quality of their report, the high standard of experimentation, their overall character, none of these aspects could alone vouch for the trustworthiness of the results. Taken together however, they formed a picture of honesty, and allowed the analyst to make claims despite the various scepticisms.

In some instances, analysts gave indications of their rightness of character and sometimes accused others of not being forthright about personal conflicts of interest. Two examples of this kind stood out in the corpus. The first came from Limbourg and his analysis of the waters of Spa. He first discussed the works of two celebrated analysts, Hoffmann and Marguery. Both had claimed that the waters they analysed were superior to those of Spa. Limbourg stated his awareness of theirs claims and added: “in the pompous praise that they make of their Waters, could interest not have guided their quill?”<sup>1433</sup> He then went through the respective treatises, and attempted to show that such claims did little to tarnish the pristine reputation of the Spa waters, while admitting that others could think of him as equally interested. In another instance, he noticed discrepancies between his own distillation results and previous findings. Upon researching the credentials of his predecessors, he concluded that in this case, he had no reason to doubt their “faith”, and that they seemed “very sincere”.<sup>1434</sup> He therefore admitted ignorance as to what might have caused the disparity and accepted that different ways of proceeding with analysis could lead to variation in results.

The second example of this kind of liability was described by Machy, in his comparative analyses of the waters of Passy belonging to the couple de Calsabigi, and the waters of Mrs Belami. Although his method was quite typical, in his text, the liking that he took to both owners transpired. He described the welcoming attitudes of both hostesses during his stay. According to him,

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<sup>1432</sup> This is a core argument of the social construction of science historiography. In this case, I am specifically referring to Fleck’s theorisation of the creation of scientific facts. Fleck, *Genèse et développement d’un fait scientifique*.

<sup>1433</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, ix. “Je n’ignore pas que quelques auteurs, dans le parallèle qu’ils ont fait de leurs Eaux avec celles de Spa, ont entrepris de donner aux premières la preference, sur les dernières [...], dans les éloges pompeux qu’ils font de leurs Eaux, l’intérêt n’auroit il point guidé leur plume ?”

<sup>1434</sup> Ibid, 87. “La promptitude à augmenter le degré du feu peut bien être la cause de cet effet ; & j’aime mieux attribuer la différence du succès de nos operations à la diverse manière de procéder que de soupçonner la foi de plusieurs auteurs, qui paroissent d’ailleurs fort sincères.”

he had been treated with nothing but kindness, and both had provided any necessary help during his work. His introduction began with a celebration of the waters of the Calsabigi, before adding that Mrs Belami should not worry herself, and that “she will be reassured by the reading of my Work”, in which he took particular care to highlight the common characteristics and positive aspects of both springs.<sup>1435</sup> The author stated in his introduction that although he sought to present an interesting comparison between the two waters, he had no intent on harming their reputation. Machy, after his pleasant stay with both spring owners, likely knew that he could not bring himself to say anything negative about either water. It is notable that he chose to disclose his clear lack of objectivity on the matter. While this might have lowered his credibility, the honesty regarding his intentions was equally important to include in the report.

Once the analysts had proven their rightness of character, they also employed various devices that helped them strengthen their claims. The word ‘proof’, or ‘*preuve*’, was routinely used by the analysts, but a proof was rarely given by a single observation. The 1754 analysis of the Spa waters used the term on two occasions. He first used it to state a claim which needed no proof, being that mineral waters, obviously, contained water. As the analyst Limbourg put it, “this element is sensible enough; it needs no other demonstration that the sentiment of anyone.”<sup>1436</sup> Limbourg then described the different ‘*preuves*’ of the presence of iron. The proofs were, according to him: the taste of the water, the results of the astringents, the changing colour of the oak gall, the stains imparted by the waters on clean laundry, the results of the evaporation, and the effects that the waters had on health. In order to convince the reader of the presence of iron, common sense was not sufficient. He therefore listed every possible observation which might lead an analyst to believe that the waters contained iron. His point called to the sensory analysis, the reagents, the dry analysis, the various observations made at the spring, and the medical empirical evidence given by the effects of the waters. Only when taken together, did these various elements constitute a proof, almost as strong as common sense.

The term made more appearances in later analyses. Laprade “proved” that the waters of Ambert contained no iron because they did not precipitate upon addition of the solution saturated with Prussian blue. In that case, the single

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<sup>1435</sup> Machy, “Examen physique et chimique d'une eau minérale trouvée chez M. de Calsabigi à Passy, comparée aux eaux du même côteau connues sous le nom des nouvelles eaux minérales de Mme Belami.”, 4. ”D'autre part, si cette nouveauté a fait craindre à Madame Belami une concurrence contre laquelle ses soins & ses peines envers le Public, semblent lui donner droit de réclamation, elle se rassurera par la lecture de mon Ouvrage, où je me suis attaché particulièrement à mettre en évidence les caractères communs à ses Eaux & à celles de son voisin, & en quoi consiste leur différence.”

<sup>1436</sup> Limbourg, “Traité des Eaux Minérales de Spa.”, 84. “Premièrement elles contiennent de l'eau ; cet élément y est assez sensible ; il n'a besoin d'autre démonstration que du sentiment d'un chacun.”

observation was sufficient to warrant the use of the word.<sup>1437</sup> He later added that the residue, after drying, showed the typical cubic structure of marine salt. In that case, a second observation was needed to definitively establish the nature of the salt, so Laprade threw the residue onto hot coals.<sup>1438</sup> They crackled, leaving “no single doubt” on its nature.<sup>1439</sup> In another analysis, the “proof of the existence of marine salt” was given courtesy of the silver dissolution reacting positively, but no other observation.<sup>1440</sup>

Establishing proof was a difficult endeavour. Some analysts made claims based on a single observation, sometimes they used two, and other times they used the widest array possible. On occasions, they even called onto witnesses, colleagues, or members of their personal networks in order to solidify their claims.<sup>1441</sup> The use of terms like “proof” and “no single doubt” can appear quite confident when contrasted with the aforementioned rhetoric of humility. But these two facets of the rhetoric were not contradictory, they worked in unison. If a claim could stand despite the doubt, and despite the liabilities, then it became much more reasonable to trust it. In a sense, the transparency of the analysis was itself an instrument of persuasion. Combined with a methodology focused on layering different kinds of proofs, the claim could become fact.

The language used by regulators reflected this dynamic. A report on a spring in Vichy stated the importance that patients “have the certitude that the virtues of this Water are really real” and have been assessed by “multiplied Experiments”.<sup>1442</sup> This report confirmed the importance of redundancy, but implied that, with enough different proofs, “real” knowledge about the virtues of waters could be established.

By the end of the eighteenth century, despite the lingering doubt and the cautious rhetoric, the waters had been firmly established as objects suitable for chemistry, and mineral waters had to undergo analysis in order to be recognised as such, per the *Société’s* orders.<sup>1443</sup> In essence, though any individual analyst could be mistaken despite the refinement of the method and the steps of redundancy, the faulty analysis would likely not go far as the errors would be caught by others in the network, either the *Société* reviewers or other

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<sup>1437</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL.

<sup>1438</sup> Another example can be found of two observations used as proof in: Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

<sup>1439</sup> Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50–53, AAL. “ne laisse aucun doute”.

<sup>1440</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. “la dissolution d’argent par l’acide nitreux produit un précipité blanc en flocons assez distincts, preuve de l’existence du sel marin”.

<sup>1441</sup> See chapter 6 on the analysts. Bertrand-Lagrésie for example went to the spring surrounding by witnesses. Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

<sup>1442</sup> Report on a new spring found in Vichy, (An XII), AJ/16/6698, AN. “il est nécessaire que les malades qui sont dans le cas d’en faire usage aient la certitude que les vertus de cette Eau sont si bien réelles, qu’elles ont été constatées par des Expériences multipliées”.

<sup>1443</sup> See Chapter 4.

collaborators. Even during the crisis of faith outlined by Hamlin in the early decades of the nineteenth century, the method of analysis might have been questioned, but the very idea of using chemistry as a way to understand mineral waters was not.

I argue this was the reason why the analytical method produced knowledge that was then accepted as fact in other spheres of society, including governing bodies. Chemical analysis shaped the market of mineral waters. It was the scientific tool that lent authority to regulatory institutions which set prices and standards for good practice. It was also embraced by actors in the market as a way to establish the quality of their product. A water that had been analysed by a respectable analyst had the potential to go from natural curiosity to marketable commodity. In a sense, the caution and doubts expressed by analysts within scientific circles did not stop the confidence of their claims for making their ways outside of scientific realms.

## Artificial waters

Few objects crystallise the dynamics of hope and optimism around the possibilities that chemistry offered quite as well as the question of artificial waters. They were often called false or “factice” waters, but though the name sounds like it was associated with fraud, it was also the name given to legitimate artificial water that were sold through official channels. The idea of making waters artificially came long before the eighteenth century.<sup>1444</sup> Various “waters” were sold in apothecary’s dispensaries, and the idea of dissolving potent materials, be they vegetal or mineral, in water was a time-honoured practice.<sup>1445</sup> It was therefore no leap to believe that mineral waters could be replicated too. But despite the idea existing early on, it was often dismissed as an impossible feat, at least for the first half of the century. Marguery quoted earlier, believed: “The human industriousness does not reach the point of making the mineral waters by artifice”.<sup>1446</sup> This opinion was shared by others, as exemplified by the common argument of nature being superior to fabrications. But when it came to chemistry specifically, I believe that another dynamic was at play.

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<sup>1444</sup> For an overview of the history of artificial mineral waters, see: Thierry Lefebvre and Cécile Raynal, “Effervescence pharmaceutique autour de l'eau de Seltz,” *Revue d'histoire de la pharmacie* 94, n°352 (2006).

<sup>1445</sup> The first page of Lémery’s list of remedies lists various kinds of water based products, such as the “Eau de Nénuphar” or “Eau Alumineuse”. Lémery, “Traité universel des drogues simples, mises en ordre alphabétique: Où l'on trouve leurs differens noms, leur origine, leur choix, les principes qu'elles renferment, leurs qualitez, leur étimologie, & tout ce qu'il y a de particulier dans les animaux, dans les vegetaux & dans les mineraux. Ouvrage dépendant de la Pharmacope'e universelle.”

<sup>1446</sup> Marguery, “Traité des eaux minerales nouvellement découvertes au village de Passy, près Paris.”, preface. “L'industrie humaine ne va point jusqu'à faire par artifice des eaux minérales, où l'on puisse remarquer des sédimens de cette nature : je n'ai point entendu parler d'aucune autre eau minérale, où l'on les observât, & en si grande quantité & en si bien differentiez”.

Chemists did not dare making attempts at replicating mineral waters at the beginning of the century because of a perceived impossibility to replicate transformations, the kinds that occurred naturally over thousands of years, within a laboratory setting. But this perception did not originate from water chemistry. It was likely part of a wider stance whose purpose was to firmly instate a difference between alchemy and chemistry, and ensure that the latter had little to do with the former. This entire sentiment was well-summarised by Bucquet, a chemistry teacher, in his 1777 lesson to a group of apprentice chemists:

In the eyes of the commoner, chemistry and alchemy often find themselves mistaken [for one another]. It is useless to want to avenge alchemy chemistry for such an injustice. It has been long since we knew to appreciate the fantasy of the Philosopher's Stone. A man who reads with reason into the Book of nature, sees no doubt that we have in our hands all which produces gold. But he sees also that we lack, what we will always lack, this primary agent with which nature operates most of its wonders, time.<sup>1447</sup>

But as the decades passed and the rhetorical boundary-work was completed, this attitude changed and optimism resurfaced. Chemists began to make promises of improving many things, such as the industry of dyes and porcelain, the yield of mines, the safety of remedies or the quality of metals.<sup>1448</sup> Most of these promises rested upon chemistry's capacity to accelerate natural processes. Chemistry was not able to produce gold on command, but practitioners could focus their knowledge of the reactivity of matter to diligently work with miners in order to improve the quality of the metals they extracted. That was seen as a new and more realistic approach to transformation. Within this content of optimism, the idea of making artificial mineral waters was reintroduced.

The discussion of artificial waters revolved in no small part around the question of definition. If a mineral water was just the sum of distilled water and a few distinct minerals, then an artificial version should not be difficult to whip up in the lab. If they were however, "a compound of several substances of which the union with water produces countless combinations", then it could be much harder to reproduce.<sup>1449</sup> In a previous chapter, I showed how the

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<sup>1447</sup> Fourcroy, *Leçons de Buquet, chimie, Précis des leçons de Chymie de Feu M. Bucquet*, (ca. 1777), Man 106, Bibliothèque André Malraux, Saint Brieuc. "Aux yeux du vulgaire, la chymie et l'alchymie se trouvent souvent confondues. Il est inutile de vouloir venger l'alchymie la chymie d'une telle injustice. Il y a longtemps qu'on sait apprécier la chimère de la Pierre Philosophale. Un homme qui lit avec réflexion dans le Livre de la nature, voit sans doute que nous avons dans nos mains tout ce qui produit l'or. Mais il voit en même tems qu'il nous manque, ce qu'il nous manquera toujours, ce premier agent avec lequel la nature opère la plupart de ses merveilles, le temps."

<sup>1448</sup> Fors, *The Limits of Matter: Chemistry, Mining, and Enlightenment*.

<sup>1449</sup> Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM. "Les eaux minerales sont un composé de plusieurs substances dont l'union avec l'eau produit des combinaisons sans nombre, leau etant un des plus grands dissolvans qui existe dans la nature, il est

definition of mineral waters kept for the extent of the period a sensory quality. Essentially, a mineral water was a product which, to the senses, presented itself as obviously different from common water, and which was associated with positive effects. These definitions implied that mineral waters had to come from natural sources, free from human intervention. The natural origin of the minerals was obvious to all who read the definition.

As the question of artificial waters gained popularity, this posed somewhat of a problem. If a mineral water could be defined as any combination of water and minerals, then it could be made artificially easily enough. However, if only nature could decide on which minerals had to be in the water, then artificial mineral waters had to follow the 'recipes' provided by natural springs. For example, a chemist would have to copy the composition of the water of Spa, in order for his composition to qualify as an artificial mineral water. This meant that any synthetic water had to rely heavily on the work of analysis. This also stressed the importance of the quantitative analysis, as the maker of artificial water had to know how much of each mineral to add in his concoction.

Not all chemists, however, believed that nature was intentional in the making of mineral waters. Some analysts stated that mineral waters were a divine gift, explaining the origins of their healing effects as a feat of god's design for nature. Others did not share this belief. Chevalier, in his 1772 analysis of the waters of Bourbonne, explained that their properties were nothing but the fruit of chance, and the remedial properties of the waters were "foreign to them".<sup>1450</sup> This turn of phrase is rather striking, as it indirectly refutes the existence of any kind of agency, be it miraculous or simply spiritual, within the water. This conception of mineral waters was more mechanical than providential. According to this view, there was virtually no difference between a natural and an artificial mineral water.

In the 1770s, analysts started to discuss the possibility of making artificial waters in more concrete terms. Some expressed doubts regarding the possibility, even the future possibility of ever making them, but by doing this, they showed awareness of the debate. Thouvenel in his memoir on the chemistry of the waters of Contrexéville, said that "Chemistry is found wanting", both in the manner of discovering the complex combinations of minerals in waters,

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vraisemblable que coulant dans des terrains remplis de matieres gypseuses, seleniteuses, dont elle est le dissolvant, nen dissolue effectivement une certaine quantité et ne sen sature jusque a un certain point a la faveur du gas mephitique". In other instances, analysts used the terminology "in the entrails of the earth" to refer to the complex processes leading to the creation of mineral waters. Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM. "Cette boisson salutare preparée dans les entrailles de la terre".<sup>1450</sup> Chevalier, "Mémoires et observations sur les effets des Eaux de Bourbonne-les-Bains, en Champagne, dans les Maladies hystériques & chroniques.", 4. "leurs propriétés qui les rendent d'un usage particulier, leur sont étrangères."

and in “imitating them in artificial mineral Waters.”<sup>1451</sup> The analyst Parmentier was also sceptical of them, stating in a memoir dedicated to the subject: “we must not be persuaded despite the progress of Chemistry that we will ever manage to make artificial Mineral Waters which could be preferred to natural ones”.<sup>1452</sup> His main problem with artificial waters concerned the procedure used in order to reach the synthetic product. In his view, there was no way of proving that nature operated in the same way that a chemist did. It is likely that he was referring to differences in primary materials. For example, what could cause the presence of iron in a water in nature was not necessarily achieved by simply having the water circulate through metallic iron. Some other kind of reaction within the earth could be at play, and the differences in procedures might cause differences in effects that were unknown to the chemist. Despite this scepticism though, Parmentier was not opposed to the idea of artificial waters altogether. He believed that they were not an ill in themselves, and they could be a lot cheaper to produce and transport, as they could be manufactured anywhere. They simply had to be viewed, in his mind, as always lesser than natural waters.<sup>1453</sup>

Much like the modest rhetoric of the analysts the caveats they gave did not stop them from attempting analysis, all the words of caution against putting too much confidence in artificial waters did not stop many chemists from attempting to make them. Just a decade later, much talk was already taking place regarding the creation of entire establishments dedicated to the manufacture, sale and administration of false waters. For such structures to be not only conceived but also built and staffed, either the understanding of artificial waters had to have changed, or the public perception of these artificial waters was so positive that it bypassed scientific scepticism.

The physician Duchanoy wrote a book on the subject in 1780, titled *Essay on the art of imitating mineral waters*, which provided a good example of the transition from suspicion to enthusiasm regarding artificial waters. Since the author was a physician who otherwise held traditional medical positions, this shows an example of the medical views on artificial waters.<sup>1454</sup> Early in the preface, Duchanoy gave one of the strongest arguments in favour of artificial waters, which was their ease of access. Natural waters, despite being numerous and found in “every county” according to some texts, tended to spring

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<sup>1451</sup> Thouvenel, “Mémoire chymique et médicinal sur les principes et les vertus des eaux minérales de Contrexeville en Lorraine.”, 56. “la Chymie est en défaut, tant pour découvrir la maniere d'être de ces combinaisons, que pour les imiter dans les Eaux minérales artificielles.”

<sup>1452</sup> Antoine Augustin Parmentier, “Observations sur la difficulté de bien proceder a l'analyse des Eaux minerales”, (1773), Ms pa 206, f38-f49, AAL. “mais il ne faut pas qu'on veuille nous persuader malgré les progres de la Chymie qu'on parviendra jamais à faire des Eaux Minerales artificielles qui puissent etre preferées aux naturelles, ainsi que quelques auteurs l'ont pretendu.”

<sup>1453</sup> Ibid.

<sup>1454</sup> Duchanoy, “Essais sur l'art d'imiter les eaux minérales, ou De la connaissance des eaux minérales, et de la maniere de se les procurer en les composant soi-même dans tous les tems et dans tous les lieux.”

more in certain regions than others.<sup>1455</sup> Regions which were not blessed with a variety of different springs had to pay expensive transport fees. This proved a reliable defence of the artificial waters. While few tried to argue that they were better than their natural counterpart, no one could argue against the lower cost. Duchanoy added to this argument that even those who were lucky enough to live near, say, a ferruginous spring, did not necessarily have access to other kinds of waters.<sup>1456</sup> Artificial waters could on the other hand offer an array of different kinds of products.

Duchanoy borrowed from chemical theory in order to cement his argument. Citing Macquer, he explained that water, by nature, always dissolved the same quantity of a product to reach the point of saturation. This meant that as long as the weight of the solute and the volume of water were controlled, artificial waters could be made in a highly replicable manner. They were also less likely to suffer from changes in temperature.<sup>1457</sup> He added a few pages later, that analysts had focused too much on temperature anyway, and spent too much time attempting to be exhaustive in their analyses. He argued that finding every mineral present in a water in minute quantities was pointless, when those rarely had effects on health in the grand scheme of things. Overall, Duchanoy had very few words of caution when it came to the use of artificial waters. He said “the Moderns, by the discoveries with which they have enriched Physics & Chemistry, have so to say made of the Science of Waters a Science entirely new.”<sup>1458</sup> Following this celebration of science were some four hundred pages detailing the various kinds of existing mineral waters, their composition, effects, and the ways in which they could be imitated by chemistry.

The report made by the Faculty on the treatise was an unambiguous endorsement, which signals that the enthusiasm towards artificial waters was larger than a single physician, as even the conservative Faculty of medicine argued for their utility. The reviewers at the Faculty stressed the argument of cost, stating that natural waters were often inaccessible to “the man of limited fortune, & always for certain to the indigent.”<sup>1459</sup> They even suggested that in the science of artificial waters, attempting to replicate the exact composition

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<sup>1455</sup> Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM. Chaque “canton a sa source”.

<sup>1456</sup> Duchanoy, “Essais sur l'art d'imiter les eaux minérales, ou De la connaissance des eaux minérales, et de la manière de se les procurer en les composant soi-même dans tous les tems et dans tous les lieux.”, iv.

<sup>1457</sup> *Ibid.*, vii.

<sup>1458</sup> *Ibid.*, xv. “les Modernes, par les découvertes dont ils ont enrichi la Physique & la Chymie, ont pour ainsi dire fait de la Science des Eaux une Science toute nouvelle:”.

<sup>1459</sup> Report by the Faculty on: Duchanoy, “Essais sur l'art d'imiter les eaux minérales, ou De la connaissance des eaux minérales, et de la manière de se les procurer en les composant soi-même dans tous les tems et dans tous les lieux.” “Un plus grand inconvénient encore, Messieurs, c'est celui qui résulte du prix que l'éloignement & les frais de transport rendent déjà considérable & que l'espèce d'administration a rendu excessif. De là vient que l'usage en est interdit souvent à l'homme d'une fortune bornée, & toujours à coup sûr à l'indigent.”

of natural waters was a fruitless endeavour. Rather, the chemist should feel free to prepare custom preparations, to concentrate the waters as much or as little as he wanted, to better suit the needs of the patients.<sup>1460</sup>

The *Société* also showed interest in artificial waters. Memoirs on the subject were discussed during its meetings, like in ca. 1783, when a paper discussing recipes for artificial waters was presented.<sup>1461</sup> This particular memoir was more focused on the methods used to imitate specific waters, like those of Spa or Bussang, all popular choices at the Paris bureau. The text explicitly cited Bergman and his method of both analysis and synthesis as the main inspiration behind the procedures. This also shows the jump that could come about between water analysis and synthesis. Bergman himself used synthesis as the very last step of chemical analysis, as a sort of check, to see if the results were correct. From there, the idea of using the synthetic water directly was not unthinkable, and it was developed in later chapters of Bergman's treatise.<sup>1462</sup> The memoir went on to list a number of these recipes. For example, the instructions regarding how to make artificial waters of Spa read as follows:

#### Water of Spa

One needs to charge three pints of pure water with fifty-four cubic inches of mephitic gas; proceeding the same as what was just said for the water of Seltz and Bussang; add in each one Pint bottle

Lime water - two ounces and a half;

A nouet, containing three grains and a half of Magnesia;

Another, containing two grains of steel filings;

Three grains, & a half of crystallised soda;

and a half grain of muriat of soda.<sup>1463</sup>

It also touched on the methods used in order to heat up these artificial waters, suggesting plunging the bottles in a bain-marie, making sure to keep them

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<sup>1460</sup> Ibid, "il en résulte le double avantage pour les eaux qui les charrient, qu'elles contiennent un sel des mars bien plus doux que le pur vitriol, & d'autres sels neutres qui se soutiennent & s'entr'aident mutuellement. Quelle simplicité, quelle économie dans les moyens !"

<sup>1461</sup> "Mémoire sur les eaux minérales artificielles", (ca. 1783), SRM 95 dossier 1, ASRM.

<sup>1462</sup> Bergman, "Physical and Chemical Essays.", 185.

<sup>1463</sup> "Mémoire sur les eaux minérales artificielles", (ca. 1783), SRM 95 dossier 1, ASRM. "Eau de Spa. Il faudra charger trois pintes d'eau pure de cinquante quatre pouces cubiques, de gaz méphitique ; procédant comme il vient d'être dit pour l'eau de Seltz et de Bussang, mettre dans chaque bouteille de Pinte Eau de chaux - deux onces et demi ; Un Nouet, contenant trois grains et demi de Magnésie ; Un autre, contenant deux grains de limaille d'acier ; Trois grains, & demi de soude crystallisée ; plus de demi grain de muriate de soude."

closed so as to avoid losing the volatile principles. The methods ranged from simple dissolution to more involved processes which could take up to several days.

These memoirs were a sign that interest in artificial waters had become more widespread. Mentions of artificial waters were even occasionally made in analysis reports. Fourcroy mentioned for example that the waters of Enghien had the advantage of being easy to imitate by artificial means.<sup>1464</sup>

The recipes for artificial mineral waters inspired the creation of several businesses. Given the simplicity of synthesis when compared to the difficult analysis, a few individuals started to manufacture and sell artificial waters. One such individual presented a project for an artificial mineral water establishment in Paris. In the proposed location, Parisian residents could receive artificial mineral water baths and showers, without having to go through the trouble of visiting a spring. The instigator of the plan credited chemistry for making the progress needed in order to make his establishment possible: “Today, as the sane Chemistry has prodigiously augmented the bulk of our knowledge, [...] the art has the power to make at will, mineral Waters perfectly similar to those of nature”.<sup>1465</sup>

More of these establishments were proposed in the following years. The Institute of Lyon debated the possibility of having such an enterprise in its city in the An IX (1800–1801). The plan also cited the advancements in chemistry which had rendered the making of artificial waters possible, by “ripping away from nature the secrets which hide in the belly of the earth”. Citing the work of various chemists, including Bergman, Rouelle and Priestley, this plan claim to use the “sublime science” of chemistry in order to provide the Lyon residents with a variety of artificial waters which sometimes had superior qualities to the natural ones.<sup>1466</sup> The debates at the Institute were very positive, and they approved of the proposed plan, believing that it would be excellent both for the patients and for reinvigorating the dormant economy of the neighbourhood. Artificial waters were, perhaps even more so than the natural ones, tied to market interest.

The enthusiastic rhetoric of artificial water fabricants appears in stark contrast with the careful and sceptical tone of many analysts. This enthusiasm was

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<sup>1464</sup> Fourcroy and Delaporte, “Analyse chimique de l'eau sulfureuse d'Enghien, pour servir a l'Histoire des Eaux sulfureuses en général.”, 302.

<sup>1465</sup> M. Bannan, “Projet d'établissement d'un bureau général d'eaux minérales artificielles privilégié pour les douches et les bains à l'usage des habitants de la ville de paris”, (ca. 1809), AJ/16/6697, n°15, AN. “Aujourd'hui, que la saine Chymie a prodigieusement accru le fond de nos connoissances, dont celle partie et démontré d'une manière palpable, que l'art a le pouvoir de faire à volonté, des Eaux minérales parfaitement semblables, à celles de la nature, de les convertir les unes dans les autres, et de les varier à l'infini ;”.

<sup>1466</sup> Gavinet, report on artificial waters, (An 9), Ms 258, f187–193, AAL. “avantages superieurs peut être a ceux que fournissent les eaux minérales naturelles.” La chimie, cette “science sublime” avait déjà entrepris “d'arracher a la nature un secret qui se cache dans les entrailles de la terre”.

not however disconnected from past efforts of chemical analysis. In more ways than one, mineral water synthesis was a logical progression of analysis. But notably, synthesis quickly eliminated the problems outlined by analysts. They did not challenge the claim that mineral waters were subtle and seemingly infinitely complex. But artificial water defenders argued that this complexity, though real, was irrelevant. What cured patients in a ferruginous water was the iron. Therefore, in order to replicate health benefits, an artificial mineral water synthesis only had to concern itself with the best way to inject the primary beneficial mineral into common water. This somewhat brute-force approach removed the veil of mystery around mineral waters, and implicitly made a claim about the connection between minerals and physiological effects. In this conception, the mineral components yielded through the analysis of waters could be connected one-to-one to their remedial effects. This understanding embodied the rational strand of mineral water science, and artificial waters were the consequence of a fully chemical conception of mineral waters.

## Universal Panacea

The rise in popularity of artificial waters, overcoming the scepticism of manmade remedies, suggests that analysis, and its counterpart synthesis, altered the conceptions of mineral waters. Those new artificial waters were sold to patients and could technically rival the consumption of natural mineral waters. This was however only one side of the story. As outlined earlier, chemical analysis never reached its ambitious objectives of fully decomposing mineral waters, and particularly, scepticism as to whether the results could be connected to effects still endured. In parallel to the growing use of artificial water, another rationale developed around mineral waters, one that embraced their air of mystery, and even used it as an advantage.

While chemical analysis had led to a rational approach of water-healing for some, particularly for the proponents of artificial waters, it remained a source of confusion for others who were not able to systematically explain the merits of all natural springs. Nowhere was this tension more visible than in the question of the ‘Universal Panacea’. The word came from Panakeia, the Greek goddess of remedies, daughter of Asklepios, god of medicine. She featured in the Hippocratic oath, as one of the deities being sworn on.<sup>1467</sup> In practice, the word ‘panacea’ in early modern times was rather used negatively. It was a shorthand used to dismiss fantasy, or wishful thinking. No one claimed to make or sell a universal panacea, on the contrary, they often claimed that a

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<sup>1467</sup> The first sentence of the Hippocratic oath reads as follows: “I swear by Apollo the physician, and Asclepius, and Hygieia and *Panacea* and all the gods and goddesses as my witnesses, that, according to my ability and judgement, I will keep this Oath and this contract.” “Hippocratic oath.”, in *A Dictionary of Public Health*, ed. John M Last (Oxford University Press, 2007).

remedy cured hundreds of illnesses, but that they were no fools, and knew that a true universal remedy was impossible. This dismissal was particularly acute during the Enlightenment, as part of a rhetoric of transparency, honesty, and rejection of charlatanism.<sup>1468</sup>

The concept of the panacea appears many times in my corpus, always used negatively. In the literature they wrote about mineral waters, physicians were quite concerned not to appear as though they were trying to sell a universal panacea, and thus endorse a deceitful practice. This I believe explains why throughout the century, texts about waters made a point to include all the conditions that were *not* remedied by those waters, to show that they were potent but targeted remedies. If waters could cure everything, more likely, they were curing nothing.<sup>1469</sup> Raulin's succinct descriptions of the Paris waters included counter recommendations of this kind for many of the entries. He wrote for example that the waters of Barèges should be avoided by any plethoric patient, or those who were coughing blood, as this symptom was known to be worsened by the waters.<sup>1470</sup>

The earliest analysis in my documents dating from 1648, made a mention of the panacea, lamenting that the myth brought too many people to the spring: "The vulgar believes that [the waters of Vic-sur-Cère] are proper for all sorts of diseases: this prejudice leads a multitude of people to vic to drink the waters".<sup>1471</sup> The analyst countered that in fact, those waters were not suited for every disease, and some people could be "troubled" if they took them against prescription. He then listed over fifty different kinds of ailments that were healed by the waters, among which the obstructions, the three types of melancholia, the diseases of the kidneys, including kidney stones, most fevers, afflictions of both the "male member" and the matrix, ailments of the skin, the head, the articulations, amongst many others. These waters also had the

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<sup>1468</sup> This was particularly manifest in the sciences. See: Wouter J. Hanegraaff, "The Notion of "Occult Sciences" in the Wake of the Enlightenment," *Aufklärung Und Esoterik: Wege in Die Moderne* (2013).; Lawrence Principe, *The Secrets of Alchemy* (University of Chicago Press, 2012).; Principe, *New Narratives in Eighteenth-Century Chemistry*. For a broader overview of Enlightenment rhetoric, see: George Campbell, *Rhetoric in the Age of Enlightenment* (SIU Press, 2003).

<sup>1469</sup> Harley, "A sword in a madman's hand : professional opposition to popular consumption in the waters literature of southern England and the midlands, 1570–1870.", 52.

<sup>1470</sup> Raulin, "Exposition succincte des principes et des propriétés des eaux minérales, qu'on distribue au bureau général de Paris.", 24. "on doit observer cependant dans tous les cas de suppuration, que si les Malades sont pléthoriques, ou sujets à des crachemens de sang ; les Eaux de Barege provoquent ce dangereux symptôme : s'il a déjà lieu, il devient plus grave par leur usage."

<sup>1471</sup> Extrait d'un livre intitulé *Traité tres necessaire a ceux qui desirent boire les eaux de Vic*, par Jean Mante D.M. imprimé a Aurillac par Etienne Borie (1648), recalled in: Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM. "Le vulgaire croit qu'elles [les eaux de Vic] sont propres pour toute sorte de maladies : ce préjugé entraine une multitude de gens a vic pour y boire les eaux"

alleged property of “furthering the end of life”.<sup>1472</sup> Upon reading such a list, the “vulgar” might be forgiven for believing that the waters were worth drinking, no matter what he or she suffered from.

This apparent contradiction endured well into the eighteenth century. A turn of phrase which avoided the dreaded word of panacea but had a similar, albeit more positive connotation, what to say that mineral waters cured illnesses that no other remedy healed. Such a mention was made by Bollioud in 1745, arguing that the waters of Rouen cured the pains that nothing else cured. The same argument was used by Lemaire in 1750 on the waters of Bussang, then by Limbourg who even risked claiming that the waters of Spa approached the idea of universal panacea, and later by Doucet who claimed that the waters of Sainte Reine cured the ailments that had so far resisted other treatments in 1760.<sup>1473</sup> These four mentions in the short span of ten years also have the ring of a trope. They show that, in a sense, some analysts really wished to say that their waters cured, if not everything, then most things. They were however aware that they could not say such a thing without incurring negative perceptions. A fifth instance of the argument was made in the revolutionary period, by an author who claimed that “a great number of patients have found by the sole use of these Waters the healing that the ordinary remedies could not have provided them.”<sup>1474</sup> This showed that this way of formulating the argument was not bound to the mid-century period.

Dom Calmet, in his treatise on the waters of Plombières, affirmed that anyone who refused the evident idea that mineral waters were a gift from providence was ignorant. Since people of all standings and all provinces came to the waters, it was proof that they were more than a mere trend.<sup>1475</sup> These positive statements were completely unexpected in literature concerning waters. In most analyses, those who authored them had incentive to be, if not entirely

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<sup>1472</sup> Ibid. The following quote is just an extract from the list of diseases said to be cured by the waters: “Suivons le trajet qu'elles parcourent. elles guerissent les ulceres chancreux et veroliques de la bouche, du palais et de l'osophage, elles consomment les glandes des m[?], corrigent leur intemperie froide, et remettent la luette relaxée. Arrivées a l'estomac elles calment les douleurs les plus inveterées, font cesser les nausees et le vomissement, retablissent l'appetit, chassent le hoquet, font disparoitre la faim canine, corrigent le vice des digestions et les crudités nettoient la pituite crasse de ce viscere, et par un long usage elles en guerissent les visceres. En sortant de l'estomac et passant par les veines meseraiques, s'il s'y rencontre quelque obstruction elles les enlèvent, desobstruent le foye, corroborent son parenchime, guerissent la cachexie, la jaunisse, et les differentes especes d'hydropisie, pourvu que le schine du foye ne soit pas parfait, dans cas elles avanceroient le terme de la vie.”

<sup>1473</sup> Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27–30, AAL.; Lemaire, “Essai analitique sur les eaux de Bussang.”, Discours Préliminaire.; Limbourg, “Traité des Eaux Minérales de Spa.”, iii.; Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

<sup>1474</sup> Report by P. and Deyeux on a letter to the minister, (An 11), AJ/16/930/A, n°268, AN. “un grand nombre de malades ont trouvé par le seul usage de ces mêmes Eaux la guerison que les remedes ordinaires n'avoient pas pu leur procurer.”

<sup>1475</sup> Calmet, “Traité Historique des Eaux et Bains de Plombières, de Bourbonne, de Luxeuil, et de bains.”, preface, 2.

celebratory, at least somewhat defending of the waters in question. This led them to make statements which skirted the issue of the universal remedy. By explaining why the waters were not panaceas, analysts had a chance of showing just how close they were to it.

In the final sentence of the analytical protocol of the *Société*, the author mentioned the importance of “avoiding to attribute [to the waters] overly general virtues, because when surpassing all belief, one merits none.”<sup>1476</sup> The need for this precision is worth noting, as it suggests just how common the tendency from analysts to making inflated medical claims really was.

Gavinet in his analysis of the waters of Montbrison used the vessel of other analysts in order to celebrate the waters, while allowing himself to be more critical at times. He explained how Hoffmann and other authors had “pushed things further still, they pretend that no chronic illness could resist the efficiency of mineral waters”. The implication was that if mineral waters were understood to scientific perfection, they could surpass any other type of remedy. In a diplomatic sentence, Gavinet concluded that “although generally physicians do not put forward these principles”, most of them agreed on the “usefulness” of mineral waters and even “their necessity in a very large number of cases”.<sup>1477</sup> A bit further though, he added a few lines of caution against poor analyses, saying:

if the desire to exalt the Waters of which they take care of above all else, and to make of each a universal panacea; if a sordid interest had not most often guided them, we would be more instructed on this part of medical matter.<sup>1478</sup>

Gavinet saw the fault as coming from the analysts themselves, who would either fake their results or wrongly interpret them, for reasons of personal interest, unrelated to the pursuit of knowledge.

In fairness to Gavinet, he was not wrong about Hoffmann’s position on the waters. His analysis of the waters of Bas Selter, translated into French in 1791, was uncritically celebratory of their wide remedial powers. He described them

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<sup>1476</sup> “Histoire de la Société royale de médecine, Avec les Mémoires de médecine et de physique médicale, tirés des registres de cette société.”, xxviii. Protocole d’analyse. “On indiquera leurs doses, leurs effets & la saison dans laquelle on a coutume de les prendre ; sur-tout on évitera de leur attribuer des vertus trop générales, parce qu’en surpassant toute croyance, on n’en méritoit aucune.”

<sup>1477</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “Mrs Schav, flare, et hoffman, ont poussées les choses plus loin, ils prétendent qu’aucune maladie chronique ne résiteroit à l’efficacité des eaux minerales, si elle étoient parfaitement connües, et qu’elles seroient de beaucoup superieures aux preparations officinales; quoique les medecins n’avancent pas en general ces principes, ils sentent tous leur utilité je dirois meme leur necessité dans un tres grand nombre de cas.”

<sup>1478</sup> Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284–287, AAL. “si l’envie d’axalter les Eaux dont ils s’occupoient par dessus toutes les autres, et de faire de chacune une panacée universelle; si un interest sordide ne les avoit pas le plus souvent guidés, nous serions plus instruits sur cette partie de la matiere medecale.”

as being the best of all remedies, which, providing they were perfectly understood, could go on to cure “the most stubborn diseases”, with an ease and safety unknown to “the chemical remedies, invented through art, & elaborated through pain.”<sup>1479</sup> Hoffman argued that opponent of this self-evident truth were just sellers of chemical remedies who were afraid of admitting their wrongdoings when confronted with empirical evidence. He added that most superstitious and fantastical ideas about remedies came from the ancients, which should not be listened to. In contrast, mineral waters were a modern remedy. Given the wide readership of Hoffmann, it is hardly surprising that most French analysts were familiar with his exceedingly positive views of mineral waters.

The advantage of mentioning other authors who made panacea-adjacent claims was that the analyst could suggest the efficiency of the waters but maintain his credibility by not making the claim himself. Other analysts blamed the public for the false belief in the panacea. Chifoliau said for example: “every water called mineral, has the same virtues in the mind of the ignorant public.”<sup>1480</sup> In a letter to the *Société*, the physician and intendant Dufour, made a series of claims regarding the bad perception of waters. He believed that the owners of the waters were partly to blame, as all of them wanted to “decorate their patrimony” with the marvels of a mineral spring.<sup>1481</sup> But he also saw the fault in the attitude of medicine, “there are no virtues which have not been attributed to waters that have no other [virtues] than those of common water.”<sup>1482</sup> Dufour however, believed that chemistry was a solution to this problem: “Physicians today would be less excusable than ever if aided by the lights of physics and of chemistry, they did not try to correct the public and to finally ensure the domain of true mineral waters.”<sup>1483</sup> In his view, chemistry would be the great arbitrator of the question, able to finally distinguish real from fake mineral waters, and subsequently sort the true remedies from the outlandish

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<sup>1479</sup> Hoffmann, “Analyse parfaite des eaux de la fontaine du Bas Selter, traduit de l'allemand en françois par Pierre-Théodore Leveling.”, iii. “Or, du nombre de tous les remedes créés, sont par préférence les eaux minérales, en partie chaudes, en partie froides, sortans du sein de la terre : je dis, par préférence, puisqu'il est certain qu'un Médecin, qui ayant d'icelles, ou plutôt de leurs vertus spécifiques, une connoissance parfaite, soulagera & guérira les maladies lès plus opiniâtres, chroniques & enracinées, avec beaucoup plus de facilité, de sûreté, & agrément du malade, que par les remedes chymiques, artistement inventés, & péniblement élaborés.”

<sup>1480</sup> Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM. “toute eau appellée minérale, a les mêmes vertus dans l'esprit du public ignorant.”

<sup>1481</sup> Correspondence from Dufour to the *Société*, (1783), SRM 90A, dossier 23, ASRM. “tout ce merveilleux dont chaque propriétaire d'eau minérale s'est efforcé de décorer son patrimoine.”

<sup>1482</sup> Ibid, “il n'est point de vertus qu'on n'ait attribuée a des eaux qui n'en ont pas d'autre que celle de l'eau commune.”

<sup>1483</sup> Ibid, “Les medecins seraient aujourd'hui moins excusables que jamais si aidés des lumières de la physique et de la chimie, ils ne cherchaient à détromper le public et à assurer enfin le domaine des véritables eaux minérales.”

panaceas. The task of spreading these lights, he said, fell incombent on the *Société*.<sup>1484</sup>

Gastellier, in 1787, shared this perspective. He likewise accused the physicians of having been far too quick in prescribing the waters. But he believed that rigorous analytical work would be a strong tool in rationalising the enthusiasm regarding the efficiency of waters.<sup>1485</sup> He and others simply believed that analysis was not yet in the position of making claims that were sufficiently reliable to counter the arguments of both charlatans and good faith, yet misguided, mineral water defenders.

This tension between miraculous waters and genuine remedies remained largely unchanged in the last decades of the eighteenth century. The analysis of the waters of Charbonnières by Marsonnat of 1789 was a striking example of the type of physician who likely over-prescribed the waters. He gave a never-ending list of different ailments cured by the Charbonnières waters, including bringing sight to the blind, speech to the aphasic, fertility and periods to women, in addition to curing paralyses, which was of “public notoriety”.<sup>1486</sup> He was however, much like his predecessors, aware of the panacea critique, and added at the end of his list a few lines explaining that “A remedy is not universal”, specifying that the waters only helped if they were taken properly, following the advice of a physician.<sup>1487</sup> For good measure, he mentioned a few people who were dissatisfied with the waters, but he did also imply that these unhappy patients had come to the waters too late to be cured. The same argument was used again in 1810, when a surgeon described that mineral waters could indeed not cure everyone, but the people who were not cured by them were incurable anyway.<sup>1488</sup>

The idea that chemical analysis could solve this issue had not left the scientific world at the end of the period either. A report of 1809 on an analysis of the waters of Saint Laurent les Bains showed precisely this. The memoir was very positive regarding the qualities of the waters. The reporter wrote: “If so many marvellous properties belong, as the author claims, to the Waters of St Laurent, we must regard these Waters as a sort of universal remedy which must alone suffice to cure almost all diseases”.<sup>1489</sup> The reporter added that Furet had probably let his imagination run a little too freely, but he made a

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<sup>1484</sup> Ibid, “C'est a la société Royale et avons, monsieurs, chargé de ce travail à dissiper les préjugés la dessus”.

<sup>1485</sup> Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM.

<sup>1486</sup> Marsonnat, “Les eaux minérales de Charbonnières, dites de Laval, en Lyonnais.” “Elles guérissent les paralysies, ce qui est de notoriété publique.”

<sup>1487</sup> Ibid, “Un remede n'est pas universel”.

<sup>1488</sup> Deyeux, “Rapport sur le tableau es maladies traitées aux bains civils d'acqui pendant l'année dernière”, (1811), AJ/16/6697, n°868, AN.

<sup>1489</sup> Deyeux, “Rapport sur un mémoire de monsieur Furet sur les eaux thermales de Saint Laurent les Bains en Ardèche”, (1809), AJ/16/6697, n°772, AN. “Si tant de propriétés merveilleuses appartiennent, comme l'affirme l'auteur, aux Eaux de St Laurent, il foudroit regarder ces Eaux comme un sorte de remede universel qui seul devroit suffire pour guerir presque toutes les maladies aux quelles l'Espece humaine n'est malheureusement que trop exposée”.

point of commending the efforts put into compiling the treatise. He added that he had no doubt the waters of Saint Laurent were good remedies. He believed that if Furet were to give a thorough analysis and more grounded interpretations, these issues would be ironed out, the waters could be advertised more truthfully, and their real properties would be better known.

Despite mounting evidence to the contrary, analysts claimed that chemical analysis, if done properly, would finally disperse the last myths surrounding mineral waters, and would bring about an era of rational use of the natural remedies. It is however not difficult to infer from the statements of these various analysts why the idea of the panacea persisted for so long. Their writings, though they made a point of opposing the idea, often only did so as a way to say that mineral waters were almost panaceas. Pressured by the forces of the market, by their own positions as mineral water intendants, or simply by their personal positive experiences with the waters, the analysts were often the ones perpetuating the idea that mineral waters held mysterious and powerful principles, which could cure almost all diseases.

Chemical analysis was therefore the vehicle that ushered a new era in mineral water consumption. It first provided the market with repeated studies publicising more and more springs as mineral, and then further enabled commerce with the possibility of imitating nature in the laboratory and providing access to artificial waters to a wider public. But despite its rhetoric, chemical analysis was never perfected to the point of fully explaining the effects of mineral waters, at least not in a way that did not simply raise further questions. In fairness to the Enlightenment analysts, it would not be before the advent of biochemistry that clear connections between chemical composition and physiological effects could be reliably established. Perhaps willingly, perhaps inadvertently, the analysts were caught in these contradictory tendencies. Under the guise of humble rationality, they advocated for the almost magical ability of mineral waters to cure the ills of mankind. In their attempts at enlightening the mineral waters, they split practices in two. On the one hand, analysis was the scientific and rational backbone of a growing market of waters which increasingly could be treated as drinks. On the other, it gave credence to a host of new practices, which embraced the intangible qualities of mineral waters, and treated them as almost universal remedies.

## Conclusion

This chapter explores the consequences of the enlightening of mineral waters. Because both market actors and regulators relied on the scientific investigation of waters, chemical analysis was embraced as the preferred way of sorting true mineral waters from unremarkable springs. This heightened the stakes put on the results of analysis, and those stakes were reflected in the analysts' overall confidence in the analytical method.

The first observation that can be made in this regard concerns the rhetoric of analysts. The previous chapter showed that a process of standardisation of the analytical procedure had taken place. But it did not show whether this method was ultimately successful in establishing factual claims about mineral waters. A brief review of the reports indicates that trust in the validity of the results was rather low. Plenty of analysts expressed scepticism regarding their interpretations, provided caveats, possible liabilities and sources of error, and expressed repeatedly that their results should be taken critically.

Taken in isolation, this rhetoric would suggest that analysts lent very little credence to their own results. My study shows that the reality was more nuanced. The main source of hesitancy came from the lack of direct connection between the results of analysis and the physiological effects of mineral waters. For example, springs which contained surprisingly low mineral contents still had noticeable effects on patients. The lack of correlation between analysis and effects confounded analysts, who had to resort to empirical observation in order to determine the medical applications of mineral waters.

When it came to establishing the chemical content of a water, analysts employed different strategies that helped the data appear more credible. They used a system of layered proofs. Few claims were based on a single observation. Whenever possible, the analysts repeated the experiments, attempting to reach factual knowledge through convergence. This in turn explains why so many steps of the analytical process were redundant. Redundancy was a key aspect of the results' reliability. This was the backbone of the implementation of chemical analysis in the world of mineral waters. On the grounds of this reliability, chemical analysis could be imposed on the market by regulatory institutions. The method was trusted to establish factual knowledge about the chemical composition of waters, but doubts about the connection to physiological effects lingered.

The scientific discourse around mineral waters was thus characterised by an apparent contradiction. On the one hand, some analysts made claims which portrayed a high level of trust. On the other, most agreed that the mineral waters still left much to be explored, and analysis was far from being able to predict their effects. Analysis had accomplished its ambitious goals or deconstructing mineral waters, but it had failed to fully enlighten them. Strong scientific claims combined with an enduring rhetoric of scepticism eventually spread outside of the esoteric circle of analysts. In its transition towards the wider public, I argue that the dual rhetoric led to a division of the practices surrounding waters in two separate branches.

The first branch concerned those who embraced the efficiency of chemical analysis and overcame scepticism. Chemical analysis was not perfect, but it was a tool which could be used to get a solid understanding of the contents of matter. And for some applications, this was all that was needed. The most visible application of the rationalist approach was the growing adoption of artificially synthesised mineral waters. While sensory approaches and the importance of empiricism never disappeared from the process of analysis,

synthesis was a much less subtle art, which did not require complex systems of redundancy. At first, chemists only attempted to replicate existing natural waters. But rapidly, they realised that their best advantage was not in trying to poorly imitate natural waters, but rather in the customisability of artificial waters. By doing this, they further accentuated the transformation of mineral waters into commodities, ones that barely needed the intervention of medical staff in order to be produced and administered. This was in a sense the origin of the large-scale market of bottled water that we know today.

The other branch embraced scepticism. If a chemist could not reliably assess which diseases a water could heal, it left space for spring owners to claim that their waters could essentially cure anything. This can be witnessed in the debates around the concept of the universal panacea, an idea which was always touted as irrational, while nevertheless being constantly referenced, and often underhandedly validated by the analysts themselves. Sure, they stated that mineral waters were not universal remedies, and that only simpletons and charlatans believed in panaceas. As I have shown however, they skirted so close to making claims of panacea themselves that in some ways, it was the analysts who encouraged the public in this belief. A way to explain the wide array of illnesses cured by waters was to presuppose an ethereal principle present in the waters, one that could not be captured by chemical analysis. This notion was incompatible with a mechanical conception of mineral waters. Instead, it perpetuated the idea that mineral waters were providential, a gift from nature that could only be enjoyed holistically from where they sprung. The ambiguous messaging of the analysts thus provided the ground on which alternative practices could thrive in centuries to come.

## Chapter 10. Epilogue: the legacy of enlightened mineral waters in modernity

The eighteenth century saw key developments in the history of mineral waters. It combined the increased reach of the market on a hitherto unseen scale, the deployment of a complex system of logistics and legislation, and the advancements of a standardised method of analysis. Though decisive, this portion of their history is rarely talked about today. I would conjecture that this has to do with patrimony. The physical spa towns and their amenities went through considerable transformations in the aftermath of the French Revolution, to say nothing of the exponential growth of the bottled water market in subsequent periods. These changes have erased to an extent the traces of Enlightenment practices. The eighteenth-century spa has almost no presence in contemporary landscapes and has been in consequence undeservedly side-lined in the longer history of healing waters.

As a way of closing this investigation of eighteenth-century mineral waters and the rich social world that revolved around them, I want to draw a succinct sketch of the therapeutic practices of mineral waters in subsequent time periods. I want to highlight a few dynamics and points of interest which came into their own in the eighteenth century and can bring a certain historical depth to the much denser historiography of waters in the nineteenth and twentieth centuries.

The enlightening of mineral waters which took place during the eighteenth century was highly dependent on the circumstances, culture and particularities of the French Enlightenment. The revolution was the cause of much change. It marked a rupture in the spa practices, as several mineral waters fell into disrepair, while new springs were discovered and soon became household names.<sup>1490</sup> Regulation also became inconsistent, as the political regimes went from republic to empire to monarchy and back to democracy. Medicine and chemistry each went through profound changes of their own, influenced by shifting conceptions of science, progress, and by industrialisation.

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<sup>1490</sup> This was the case for a number of springs, like the waters of Saint Galmier which were renamed to Badoit in the early nineteenth century, or artificial waters like Schweppes. See: Merley, *Histoire des eaux minérales de Saint-Galmier.*; Philip Rieder, “La pharmacie Gosse et les eaux minérales artificielles à Genève (1789–1805)” (*Thermalisme et Politique (XVIII–XIXe siècle)*, 2021).

This created a perfect storm for the mineral water market. Changes in ownership laws and the further exploration of springs participated in a wide diversification of water-based therapies. While spa culture was on the rise and ever more accessible thanks to improvements in transportation, the transport of bottled water, already a popular venture of most mineral spring owners in the eighteenth century, expanded to a truly industrial scale.<sup>1491</sup> In the first decades of the nineteenth century, the lines between remedy and drink became less clear. Artificially carbonated water became a staple of the bottled water market.<sup>1492</sup> Plain water was also becoming an expected part of a healthy diet, following a number of sanitation campaigns.<sup>1493</sup> This kind of consumption warranted less control from medical authorities, which led to a firmer separation between the practices of spas and those of drinking bottled water.<sup>1494</sup>

The nineteenth century saw the introduction of numerous alternative medical practices. Spas were receptive to this new branch of medicine and started to include them as a complement to the use of the waters. Water-healing itself relied on a holistic approach of health, one which embraced the mystery of the effects of mineral waters. An example of this was the blend between spa therapies with the early practice of homeopathy. Adams describes: “The principle that a healthy regimen was fundamental to gaining and maintaining good health lay at the heart of both spa therapy and hydropathic practice.”<sup>1495</sup> A number of alternative medicine methods were innovated at spas too. In Vichy for example, a new kind of four handed massage which took place entirely in a shower of mineral water was added to the roster of available treatments. Roberta Bivins describes the attitudes towards alternative medicine in the nineteenth century as one of “medical agnosticism”, implying that no strong border was perceived by patients between the different kinds of therapy.<sup>1496</sup>

Mineral water medicine took on the new name of hydrotherapy, which encompassed the wider range of different healing methods that made use of the spring. In France, the habit of visiting mineral springs was renamed to “thermalisme”. The term had the implication of a lifestyle rather than the consumption of a single remedy. People practiced thermalism, instead of simply drinking mineral waters. While hydrotherapy was used in a variety of alternative

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<sup>1491</sup> Nicolas Marty, “La consommation des eaux embouteillées. Entre alimentation, distinction et hygiène,” *Vingtième Siècle* 91, no. 3 (2006).; Andy Opel, “Constructing purity: Bottled water and the commodification of nature,” *Journal of American Culture* 22, no. 4 (1999).

<sup>1492</sup> Ian Miller, *Water: A Global History* (Reaktion Books, 2015).

<sup>1493</sup> Chaplin, “Why Drink Water? Diet, Materialisms, and British Imperialism.”

<sup>1494</sup> Literature concerning bottled water after the eighteenth century typically conceptualises it as a commodity, entirely separated from the practices of the spa. See: Richard Will, “Bottled Water: The pure commodity in the age of branding,” *Journal of Consumer Culture* 6, no. 3 (2006).; Jean Pierre Fourcat, “Le développement international du secteur des eaux minérales embouteillées,” *Les Annales des Mines* (1998).; William Back, Edward R. Landa, and Lisa Meeks, “Bottled Water, Spas, and Early Years of Water Chemistry,” *Groundwater* 33, no. 4 (1995).

<sup>1495</sup> Adams, *Healing with Water: English Spas and the Water Cure, 1840–1960*, 156.

<sup>1496</sup> Roberta Bivins, *Alternative Medicine?: A History* (Oxford University Press, 2010), 3.

treatments, it did not completely leave the realm of orthodox medicine, and physicians were still recommending the use of natural mineral waters. A number of high-profile visits to the springs kept thermalism in the public eye, too much to be ignored by medical authorities.<sup>1497</sup> The imperial family in particular often visited the springs, and consolidated their reputation as luxurious resorts, especially in the first half of the nineteenth century.

In the latter half of the century, a strong movement towards medicalisation and the rejection of charlatanism put thermalism in a difficult position. A few physicians, especially the partisans of neo-vitalism, argued for the continuation of hydrotherapy as a legitimate medical practice. But they were often criticised, and the ensuing medical controversy resolved in the distancing of cold-water cures from mainstream methods of healing. Thermalism became relegated to a form of last-resort therapy, only to be used in cases that had become hopeless to orthodox medicine. This attitudes towards water-healing described by Arnaud Baubérot in his study of French hydrotherapy: “Only mental pathologies and chronic illnesses, which pathological anatomy cannot grasp, the physiological causes of which remain obscure and against which the usual remedies are still relatively powerless, are still entrusted to [hydrotherapy].”<sup>1498</sup> This was a far cry from older arguments which attributed the cure of most ills to mineral waters. It shows however that by the late nineteenth century, the exact effects of mineral waters were still somewhat hazily understood. They were no longer prescribed, and yet not fully abandoned.

If hydrotherapy was endorsed by orthodox medicine only as a last resort, water therapies had to rely on a different rhetoric if they were to keep a clientele. Spa towns therefore changed the way of advertising their services. Newer pamphlets advertised a much broader set of amenities to entice visitors. They praised the air, the quality of the food, and the offer of a full relaxation of the mind, which, supported by the healthy drink, was sure to bring people back to health. Such environmental arguments were much more efficient in convincing the public, given the odd placement of mineral waters in the new pharmacopoeia. The effectiveness of this rhetoric was attested by the continued high attendance of spa towns throughout the nineteenth century. With or without the official medical endorsement, the public was eager to be healed by waters.

The popularisation of hydrotherapy and the promotion it made of a healthy lifestyle was seen far beyond the borders of France. Some extensive work has been made on the case of American waters, and literature on the subject

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<sup>1497</sup> Bugnot, “Le prototourisme médical : le thermalisme sous le Second empire.”; Authier, Duvernois, and Lefébure, *Patrimoine et traditions du thermalisme*, 1.

<sup>1498</sup> Baubérot, “Chapter III: Les vicissitudes de l’hydrothérapie en France.”, 24. “Seules lui sont légitimement confiées les pathologies mentales et les maladies chroniques, que l’anatomie pathologique ne peut saisir, dont les causes physiologiques demeurent obscures et face auxquelles les remèdes habituels sont encore relativement impuissants.”

suggests similar evolutions.<sup>1499</sup> Towards the very end of the nineteenth century, the market of bottled waters skyrocketed, but as with the late eighteenth century, the discussion still raged as to whether or not chemistry could reproduce the properties of natural mineral waters.<sup>1500</sup> Around the same time, thermalism, alongside other alternative therapies, started to lose some of their momentum.<sup>1501</sup> In Europe, the World Wars marked the definitive end of its golden age in the *Belle Époque*.<sup>1502</sup> Hydrotherapy did not vanish from existence, but it saw decreased attendance. Spas remained in the public consciousness, and the larger establishments kept a flow of visitors, albeit reduced. Those remaining facilities were mostly addressed at older and wealthier patients, offering a range of therapies using the long persistence of the practice as endorsement of its benefits.

The different European countries were not on an equal playing field when it came to this decline. The British practice of lengthy spa visits was close to complete disappearance in the twentieth century, while German and Italian springs kept attracting patients. The French case once again differed from its neighbours. George Weisz stated that “While the German waters seemed to achieve the curious mix of modern medicine and ‘alternative’ treatments aiming more towards ‘health tourism’, the French waters were heavily medicalised.”<sup>1503</sup> Though the spas were not treated on the same level as clinical medicine, they were still partially under the control of medical regulation.<sup>1504</sup>

It was not before the late twentieth century that French thermalism suffered from a true drop in confidence, with “a majority of physicians” no longer giving much credit to the practice of cures.<sup>1505</sup> Despite firm institutional ties between hydrotherapies and orthodox medicine, including faculty chairs reserved for hydrology, the shift towards evidence-based medicine and the need for quicker and more reliable medication increased the long-held suspicions towards water cures in France. To this day, the French public healthcare

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<sup>1499</sup> Susan E. Cayleff, *Nature's Path : A History of Naturopathic Healing in America* (Johns Hopkins University, 2016).; Cayleff, *Wash and Be Healed: The Water-Cure Movement and Women's Health*.

<sup>1500</sup> Bullard, *Healing Waters: Missouri's Historic Mineral Springs and Spas*.

<sup>1501</sup> Ibid.; Cayleff, *Nature's Path : A History of Naturopathic Healing in America*.

<sup>1502</sup> On this period in thermalism, see: Férérol, “Luxure, calme et volupté dans les villes d’eaux françaises à l’âge d’or du thermalisme (Belle Époque et Années Folles).”; Carrion, “Villes d’eaux, villes de loisirs.”

<sup>1503</sup> Weisz, “Le thermalisme en France au XXe siècle.”, 101. “Alors que les eaux allemandes semblent réaliser le curieux mélange d’une médecine moderne et de traitements “alternatifs” visant plus au “tourisme de santé” et au “bien-être”, les eaux françaises sont lourdement médicalisées.”

<sup>1504</sup> Lefebvre and Raynal, *Du thermalisme à la médecine thermale. Aux sources du vrai « made in france »*, 107–120.

<sup>1505</sup> Weisz, “Le thermalisme en France au XXe siècle.”, 106. “Un problème encore plus sérieux est celui du discrédit des cures auprès d’une majorité de médecins.” According to Audrey Mallet, even a town like Vichy who suffered a serious reputational hit during the second world war recovered much of its attendance by the 1950s. Audrey Mallet, *Vichy contre Vichy, une capitale sans mémoire* (Belin, 2019).

system still prescribes and partially reimburses water therapies, especially in cases involving arthritis, or in treatments of Parkinson's disease.<sup>1506</sup> This healthcare coverage has its critics, who decry the use of public funds to finance what they claim to be nothing but a holiday involving dubiously effective mineral water bathing.<sup>1507</sup>

In recent decades, while the popularity of traditional spa culture has continued to trend downwards, other water-based therapies have surfaced, and are still benefitting from a solid market. This should be viewed in the context of the revival of alternative medicine that has been taking place since the 1990s. Bivins describes how "Today, patients and the lay public are much less empowered to intervene in the practice of medicine [...]. However, if patients are less able to sponsor innovations in orthodox medicine, they remain powerful advocates for alternative, complementary, and cross-cultural medicine. This in turn is a potent force in the modern medical marketplace".<sup>1508</sup> This global marketplace is a key component of the modern uses of healing waters as part of a broader 'wellness culture'.<sup>1509</sup>

New-age water therapies come in a few different shades. Many are in essence similar to traditional spa practices, content with adding mood lighting and yoga sessions to older water establishments, while avoiding overtly medical claims. This is substantially just another version of the rebranding of spa towns to suit the taste of contemporaries. Other modern claims of the healing properties of waters are distinctly less evidence based. The popular theory which claims that water keeps a memory of its past is a common staple in some fringes of wellness culture.<sup>1510</sup> Water enjoys a special place among other substances in the wellness discourse, linked to its roots in vitalism. The idea that water cannot simply be reduced to its molecular structure, and that its participation to life suggest the existence of an intangible yet potent healing principle endures in modern examples.

This very brief summary of the history of water therapies shows just how varied water-healing can be. In the last three hundred years, waters have been

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<sup>1506</sup> Assurance Maladie, Sécurité Sociale, formulaire No 11139\*02, cerfa, "Questionnaire de prise en charge cure thermale".

<sup>1507</sup> A public report on thermalism was conducted in 1995. It raised such concerns, particularly in section 2, chapter 2 on the dispersion of costs. Cour des comptes, *Les interventions publiques dans le domaine du thermalisme: rapport au Président de la République suivi des réponses des administrations collectivités et organismes*, Cour des Comptes (Paris, 1995), 18–33.

<sup>1508</sup> Bivins, *Alternative Medicine?: A History*, 40.

<sup>1509</sup> Cecily Jane Maller, "Understanding health through social practices: performance and materiality in everyday life," *Sociology of Health & Illness* 37, no. 1 (2015).; Carol-Ann Farkas, "'Tons of Useful Stuff': Defining Wellness in Popular Magazines.," *Studies in Popular Culture* 33, no. 1 (2010).

<sup>1510</sup> See for example the widely speculative claims of Emoto regarding the structure of water and its alteration when exposed to 'positive' or 'negative' words. Masaru Emoto, "Healing with water", *The Journal of alternative and complementary medicine*, 10, no. 1, (2004). Other wellness culture staples include products such as alkaline waters, structured water, or hydrogen water.

used as drinks, baths, showers, as a medium for physical therapy, spiritual betterment, as a detoxifying agent for real and imagined poisons, among many more examples. Water is ubiquitous to healing, because it is also ubiquitous to life. One constant is that water therapy has found legitimacy by planting roots in both official and unofficial medicine, which left it in a consistent state of tension. Throughout their history and to this day, there was no clear consensus on whether water therapies constitute orthodox or alternative medical practices. In that sense, echoes of the enlightened waters of the eighteenth century, and their mixed conceptions of enthusiasm and scepticism still endure. These dynamics continue to shape the public image of mineral waters well into the twenty first century. The convergence of market, regulatory and scientific interests have also been a common fixture of later periods, making the eighteenth century a powerful explanatory tool in understanding the long history of mineral water consumption.

A recent definition of mineral waters from the journal *Developments in Earth and Environmental Sciences* stated:

By mineral waters, the majority of investigators mean all waters with a dissolved ingredient content of more than 1,000 mg/l as well as natural waters with low mineralization if they contain one or several specific components that exert (sic) therapeutic action on the human organism. In order for groundwater to be classified as mineral waters, they must contain specific components such as Li, Sr, Ba, Fe, Mn, Br, I, F, B, H<sub>2</sub>S, HSiO<sub>3</sub>, CO<sub>2</sub>, and Ra.<sup>1511</sup>

This definition is distinctly chemical in nature. While an eighteenth-century chemist would have called CO<sub>2</sub> dephlogisticated air, and H<sub>2</sub>S spirit of sulphur, the intent is the same. A certain quantity of minerals, determined by the means of chemical analysis (referred to as “titration”), determines what constitutes a mineral water, in addition to the presence of components which exert effects “on the human organism”. This mode of definition was firmly implanted in the midst of the eighteenth century and has remained ever since.

Notably, this modern definition then went on to describe the enduring national differences in the conceptions of mineral waters, saying: “The very concept of mineral water differs to some extent in different countries. By mineral waters, French scientists most often mean waters with therapeutic properties and acknowledged as such by the Medical Academy of France.”<sup>1512</sup> The Medical Academy of France referred to here, was founded in 1820 as direct successor to the Société de Médecine, and was based on the academic ideals of the late *Société*. French mineral waters, despite deep changes and a long history of navigating between orthodox and alternative practices, are still understood to be chemically validated substances of intangible medical effects,

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<sup>1511</sup> Miomir M. Komatina, “Medical Geology: Effects of Geological Environments on Human Health,” in *Developments in Earth and Environmental Sciences*, ed. Miomir M. Komatina (2004), 1.

<sup>1512</sup> *Ibid.*

validated by the central institution of the Academy. Mineral waters thus undoubtedly retain something of the enlightening process of centuries past.

## Chapter 11. Conclusion

In 1781, Girard de Marvejols, intendant of the mineral waters in the region of Mende, wrote to the Société de Médecine in order to inform them of his local mineral springs. Girard was a physician, and a correspondent of the *Société*. On this occasion, he was answering a call from one of its Associates, Carrère, and exclaimed how honoured he felt to be needed by the institution. He listed dozens of mineral springs as well as analytical works that had been published on them, including titles spanning more than a century. Like other analysts, Girard was not afraid to share the opinions he held regarding the work of his colleagues. While he had positive things to say about Venel, Hoffmann, Wallerius, Macquer and other authors, he had a bone to pick with a particular treatise written on the waters of Bagnols.

The treatise he was attacking was published in 1651, and titled *L'Hydrothermopotie des nymphes de Bagnols en Gevaudan*.<sup>1513</sup> Girard found its title “magnificent, pedantic and bizarre”, and accused the author of having “troubled our Waters, [...] instead of enlightening their history.” According to Girard, this was because at the time, “chemistry was in the crib, or rather it did not exist”, meaning that all ideas presented in the treatise were “vague”, “erroneous”, “useless” and “dangerous”.<sup>1514</sup> Girard demonstrably believed in the ability of chemistry to not only uncover the true principles of mineral waters, but also in its capacity to make their consumption safer.

Girard’s criticisms were not simply levied against the results of the treatise. He attacked its form too. First, he criticised the author – a bishop – for masking his own lack of skill by justifying the chaos of mineral waters as an act of God.<sup>1515</sup> Girard also mocked his style, claiming the author was “as bad a poet as he was a physicist”, and cemented his point by quoting a few lines of poetry about various intestinal diseases, which were admittedly not great feats of

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<sup>1513</sup> Michel Silvestre de Marcillac Baldit, évêque de Mende, “L’Hydrothermopotie des nymphes de Bagnols en Gevaudan : ou Les Merveilles des Eaux & des Bains de Bagnols. Reconneuë & averé,” (Lyon, Jean Huguetan, 1651).

<sup>1514</sup> Correspondence from Girard to the *Société*, (may 5<sup>th</sup> 1781), SRM 93B, dossier 30, ASRM. “C’est sous ce titre fastueux, pédantesque et bizarre que ce Médecin n’a fait que troubler nos Eaux, s’il est permis de s’exprimer ainsi, au lieu d’en éclaircir l’histoire. Comme de son temps, la chimie étoit dans le berceau, ou plutôt qu’elle n’existoit pas, nous n’avons pas été surpris de ne trouver dans sa brochure que des idées vagues ou erronnées, et par conséquent inutiles ou dangereuses, touchant les principes qui minéralisent ces eaux.”

<sup>1515</sup> Ibid, “Baldit sentant son insuffissance pour en faire l’analyse, dit qu’il n’appartient qu’à dieu seul de débrouiller le cahos de la qualité et de la quantité des minéraux qui les composent.”

literature.<sup>1516</sup> Girard concluded: “The unconventional style of his work has some erudition, many great and small ideas of pietism, but is otherwise without taste and without true science.”<sup>1517</sup>

This scolding critique says much about the state of mineral water science in the late eighteenth century, and summarises a large amount of the dynamics studied throughout this thesis. A notable point in this example is that Girard himself was no famed scientist, nor was he a well-connected Parisian doctor or a member of the Academy of Sciences. He was a mineral water intendant. Despite his apparent distance from the urban centres of Enlightenment sciences, he ardently defended the importance of scientific knowledge in general, and chemistry in particular. He even suggested that scientific writings about mineral waters ought to be made in a particular style, one that discarded appeals to the divine and fanciful rhetoric, in favour of precise analytical measures and references to trusted authorities in the field. He spoke from within a network, adopting the posture and argumentation of the field of mineral water science.

Girard’s role as an intendant highlights the ever-present links between the market of mineral waters and chemical analysis. Girard might have toned down his criticism if he had not believed that the “bizarre” 1651 treatise risked damaging the reputation of the waters he administered. The fact that Girard was responding to the *Société’s* request is also a reminder of its active role in compiling knowledge about mineral waters, and of its intervention in the market of waters.

While my thesis has showcased the continuity in scientific practices throughout the early modern period, the actors of the late eighteenth century certainly believed in the idea of progress, and they saw themselves as having created scientific knowledge about mineral waters that was so new, so precise and so advanced that it rendered all past efforts obsolete. In my work, I have endeavoured to show that Girard’s attitude was not the product of an eccentric anti-clerical physician, or that of an unusually knowledgeable small-town doctor. He rather embodied a wider dynamic of Enlightenment-era physicians, who used biting and subversive prose to argue against ignorance and celebrated the light they shed on mineral waters.

Having presented this microcosm of the interconnected axes of my thesis, for the remainder of this section I will turn to the overall contributions of my

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<sup>1516</sup> Ibid, “Michel Baldit étoit aussi mauvais poëte que mauvais physicien, comme on peut le voir par les vers suivants.-

venez donc altérés, dégoûtés, hydropiques  
graveleux, oppilés, ennoués, asthmatiques  
indigestes d'estomac, catharveux de cerveaux,  
ictériques, assiégés de coliques encores  
et vous que le mal prend et poursuit en remores,  
venez je vous semonds(?) à ce fleuve nouveau.”

<sup>1517</sup> Ibid, “Le style singulier de son écrit avoit quelques éruditon, beaucoup de grandes ou de petites idées de piétisme, mais qui étoit d'ailleurs sans goût et sans vraie science.”

study. The conclusions that can be drawn from this investigation of the market, regulation and science of mineral waters fall into two broad categories. The first encompasses findings which suggest a reevaluation of the longer history of thermalism. The second regards conclusions which, while stemming from the world of mineral waters, speak to the broader historiography of Enlightenment France.

## Enriching current understandings of the history of thermalism

The practice of using mineral waters for therapeutic ends, which began to be referred to as ‘thermalism’ during the nineteenth century, has been a richly studied historical practice. Spa towns have attracted millions of visitors throughout the centuries of their existence and have been fertile ground for multiple intersecting societal dynamics. Whether to study architecture, medicine, sociabilities, gender relations, political campaigning, gambling, or transportation, the spas have offered compelling case studies for historians. But though thermalism has been the subject of extensive research, the early modern spa has received much less scholarly attention. By addressing this gap, my study has put forward new perspectives on the longer history of thermalism. I have argued that mineral waters in the eighteenth century were understood and circulated via an entanglement of regulatory, scientific and market forces, which, despite their friction and inefficiencies, resulted in the explosive popularity of mineral waters. Ultimately, these forces paved the way for the large-scale distribution of bottled waters of later centuries and enabled the expansion of a vast new field of knowledge.

The most exploratory aspect of my work concerned the market of bottled waters. My thesis has presented a rich image of this market at the scale of the French kingdom, highlighting the roles of key actors in this trade. The logistics started with spa town authorities, particularly the intendants who arranged the transport and lobbied for their springs. The transporters, too, were essential to ensure the smooth circulation of domestic and foreign mineral waters. My study has also given new depth to the institution of the bureau of distribution of mineral waters. Bureau tenants were a pillar of the market, and acted as an interface between suppliers and patients. Finally, the market was controlled by a battery of inspectors, local physicians, town parliaments and regulators who attempted to curb fraud and promote their interests in selected regions. The unprecedented access to mineral waters within the French kingdom was enabled by the work of these actors.

In addition to bringing out the social world of water suppliers, my study has also examined the economic state of the mineral water market. I have shown this market to have been relatively inefficient, in part due to its reliance on monopolistic privileges. While not stopping the bureaus from becoming

widespread and reaching most medium-sized towns by the end of the century, the inefficiencies meant that bureaus had low profit margins. Many only contributed to a portion of a family's livelihood but persisted due to high local demand. Even in smaller towns, bottles could be stocked and sold by the hundreds, and the market was of course significantly larger in bigger towns. The average price of a bottle, a little over 1<sup>l</sup> per pint, put mineral waters in a similar price range as other remedies. They were expensive, but not out of reach of the bourgeois and artisan class. With an increasing number of localities attempting to insert their mineral springs into this growing market, the commerce of bottled mineral water went from isolated occurrences to large-scale system, projecting some waters into newly found fame, and generating small profits for a large group of market actors.

This growing market was administered by another important group in my study: the regulators. Although the institutions of the First physician, the Commission Royale de Médecine and the Société de Médecine have received some scholarly attention, my study has reframed them through the lens of mineral waters. I have showed how crucial the administration of mineral waters was to these institutions' funding, and how much of daily activities mineral waters occupied. By providing a new look at the inner workings of these institutions and members, I have highlighted their contributions within the sciences. These contributions were varied. The secretary Vicq d'Azyr for instance enabled a kingdom-wide correspondence, promoting the exchange of scientific knowledge. The regulators also weighed in on the state of mineral water science directly, the most striking example of which being the role of the *Société's* expert-chemists who reviewed water analyses. Both *Commission* and *Société* promoted chemistry as necessary for medical professionals working with mineral waters, and cemented its place as the skill-set best able to appraise the quality of mineral waters. Even though chemical analysis existed long before the creation of these institutions, their attitude towards chemistry encouraged a much larger acceptance of its methods and overall utility.

This brings into focus another important finding of my thesis concerning the identity of the regulators. The *Société* was staffed with medical and chemical practitioners who were not state officials by trade, but worked in close collaboration with the state, particularly with select personalities, like the minister Turgot. In their proposed regulatory plans, the Associates put scientific advancements as a core pillar. But they also had concerns tied to morality and economics and were largely successful in lowering the prices of mineral waters. *Société* Associates therefore embraced dual roles of *savant* and legislator, and the resulting attitude towards power showcased this identity. They promoted progress, collaboration, and equality in matters of science, but enacted strict top-down power structures in matters of law. While their scientific ambitions were met with enthusiasm, the centralised legislation encountered resistance.

By studying the correspondence of the *Commission* and *Société*, I have been able to show the extent to which the market defied centralised power.

Because of this, I have proposed the term ‘decentredness’ in order to describe the mineral waters and the regional market actors who distributed them. A strong central power was unable to adapt to the multitude of local habits and regional laws. The regulators therefore spent most of their time attempting to solve interpersonal conflicts, arguing with reluctant town parliaments, and trying – often failing – to limit the multiplication of dubiously legal mineral water distribution arrangements.

The concept of decentredness extended to a network which has constituted one of the essential findings of my study: the analysts of mineral waters. By sketching a simple prosopography of eighteenth-century analysts, I have demonstrated the existence of a hitherto unknown coherent and connected group of scientifically minded actors. They almost all shared a double expertise in medicine and chemistry, cited similar references and often interacted with one another. They used the analytical reports as a platform to share opinions on the advancements of analysis, and wrote in a recognisable style, despite individual variation. Using a Fleckian term, I have argued that the analysts constituted an ‘esoteric circle’. This circle shared a language and writing style, functioning in partial autonomy from adjacent fields. The esoteric circle of analysts was able to communicate efficiently, and to contribute essential developments to general chemistry. Despite the consistency found in their work, the analysts did not all belong to a single institution, and most of them resided in small towns or in the countryside. The only way to see their connection is through their work, and occasionally through correspondence with the *Commission* or *Société*.

An investigation of the analysts’ work has revealed further compelling discoveries regarding the practice of eighteenth-century chemistry. The particularities of mineral water analysis have never been the object of their own study. Given how often they were performed, they constitute an unusually large and diverse case study for the development of chemistry, which does not centre on the contribution of a single practitioner. My enquiry has demonstrated the persistently crucial place of sensory chemistry in water analysis. Despite claims of the sensory being gradually phased out of scientific practice, an examination of sensory vocabulary showed that the senses were a reliable and communicable aspect of the analysis, used by almost all analysts as a scientific tool.

The following steps of water analysis likewise show high levels of consistency. A broad study of the analytical procedure shows a tendency towards standardisation. I propose to call this a ‘soft standard’. Complete standardisation never took place and would have been undesirable from the perspective of eighteenth-century analysts. The idiosyncrasies of each mineral water required constant tweaking, and advancements in the methods required the analysts to update their work regularly. The ‘softness’ of the procedure made it more adaptable. Some steps, like the use of reagents, and the combined process of evaporation and solvent extraction, were performed by virtually all analysts. The manner of applying these methods varied, but never to the point

where they became unrecognisable. The consistency of the method eventually led to growing acceptance of the knowledge produced by analysts. The large number of redundant steps, the willingness of analysts to constantly put their results in question, and the thorough review process made by peers and institutions increased trust in the ability of analysis to produce factual knowledge. I have exemplified the trust in the capacities of chemistry by showing the early popularisation of artificial waters, which became not only accepted following decades of criticism, but also commercially viable by the early nineteenth century.

Chemical analysis had the stated goal of separating and identifying the contents of a mineral water, but the operation was not purely academic. Most analysts hoped that this identification would in turn lead to a more precise understanding of the water's medical effects. In regard to this ambition, I have found that chemical analysis was much less successful. Analysts expressed repeated scepticism regarding the possibility of connecting chemical content with physiological effects, and often had to resort to empirical observations in order to ascertain the medicinal properties of waters. In consequence, though chemical analysis remained firmly implanted as the tool with which to appraise the contents of mineral waters, the mystery surrounding their effects lingered, adding a certain amount of mystique to the cures performed by mineral waters. I have shown that this was not detrimental to the marketability of the waters. On the contrary, spring owners and intendants embraced the idea that waters possibly contained ethereal and undetectable healing agents. By arguing that mineral waters could not be fully captured by analysis, they could claim that their remedial effects were almost those of a universal panacea.

The consequences of the scientific investigation of mineral waters, on one hand embracing rationality, on the other celebrating mystery, highlight an important contribution made by my study regarding the complexity of knowledge construction and the unintended effects of scientific endeavours. Among historians of science, it no longer needs to be stated that knowledge is constructed collectively, that it evolves non-linearly, and that social factors influence its course. That is however less clear in the broader field of history. Within thermalism historiography, naive conceptions of science and chemistry are abundant. Against this background, my study has worked to bring together perspectives from the history of science and the social history of thermalism. Facts about mineral waters did not come out of nowhere, they came from a lengthy and complex system of standardisation that took the better part of a century before reaching consensus. The entire procedure was characterised by hesitation, compromise, and redundancy as a way to counter unavoidable experimental mistakes. This scientific field, painstakingly built on fragile foundations, underpinned much of the market and regulation of mineral waters, to an extent that is easily missed in the existing literature on the subject.

The most general finding of my study regarding the longer history of thermalism has been to show just how much the enlightening of mineral waters was tied to scientific investigations. This is not to dismiss the importance of

other dynamics, but rather to state that the market and regulatory forces were inextricable from scientific work. Scientific inquiries on mineral waters were performed by a network of analysts. Those analysts often worked within the market of waters themselves. Moreover, this market was regulated by successive medical institutions, which applied a scientific standard to the market of waters. Essentially, the ambition to find out more about mineral waters, and to establish facts about their composition and effects, was the binding agent which kept the social, market and regulatory forces in a coherent whole. This point, I believe, is important to stress. Many studies of thermalism assume that scientific practice only became prevalent in the nineteenth century onwards, and that the complex hierarchies between scientific and medical experts and consumers can only be studied in later periods. My study challenges this view, by demonstrating the presence of scientific practice in the eighteenth century, to an extent which is too prevalent to ignore. My study has not presented the ‘origins’ of thermalism, nor the ‘prehistory’ of scientific conceptions of mineral waters. Rather, it has highlighted a time in which both were already present and thriving.

## Contributing to Enlightenment historiography

Aside from bringing new perspectives to the history of thermalism, my study has repeatedly interacted with scholarship on eighteenth-century France and the Enlightenment. This period has been the stage on which developments of significant magnitude have taken place, and the Enlightenment itself has been present in most conversations regarding the foundations of modernity. Because of this wide-reaching legacy, the events and social worlds of the eighteenth century have been thoroughly studied by historians who have unveiled the intricacies of this crucial moment in time. My work relates to prior research in two ways. On one hand, my conclusions have corroborated prevailing narratives of the period, whilst supplying them with additional depth and precision. On the other, my findings have challenged prior claims by proposing a revised way of viewing the evolution of science, particularly chemistry, throughout the French eighteenth century.

My investigation into the commerce of mineral waters corresponds to the former dynamic. The development of the mineral water market is in many ways correlated to the broader commercialisation of remedies in the period.<sup>1518</sup> While the history of pharmacy and remedies has often been viewed through

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<sup>1518</sup> Pratik Chakrabarti, “Medical Marketplaces beyond the West: Bazaar Medicine, Trade and the English Establishment in Eighteenth-Century India,” in *Medicine and the Market in England and its Colonies, c. 1450–c. 1850*, ed. Mark J. S. Jenner and Patrick Wallis (London: Palgrave Macmillan, 2007).; Ian Mortimer, “The Rural Medical Marketplace in Southern England, c.1570–1720,” in *Medicine and the Market in England and Its Colonies c. 1450–c. 1850*, ed. Mark J. S. Jenner and Patrick Wallis (London: Palgrave Macmillan, 2007).

the lens of medical history, a focus on the market highlights important social and economic dynamics which are just as fundamental in understanding the practices surrounding early modern remedies.<sup>1519</sup> In this case, I have been able to demonstrate the persistence of market concerns, including in the medical discourse surrounding waters. The scientific methods used to appraise mineral waters were endorsed in large part because they lent respectability to springs and attracted patients and prescriptions, further enabling the market. The blend of medical science and economic interests is a well-known phenomenon, but it is not always possible to demonstrate it for early modern periods.

My study has also brought new material through which to view the final decades of the *Ancien Régime*. I have highlighted the consistent struggle of regulatory institutions to impose strict legislation on the market of mineral waters, and their approach to rulemaking which favoured ever-increasing complexity rather than adaptability. The repeated failures of this strict power structure can be viewed in the light of an increasing disregard of monarchical power, especially in the years preceding the revolution. To be entirely clear, I am not arguing that the French revolution took place because of the mineral water market, but the increasingly brazen way in which actors in that market disregarded monopolistic privileges can be correlated with a tendency of ignoring state power, despite an uptick in sanctions.<sup>1520</sup>

Similarly, a comparison of *Ancien Régime* and revolutionary regulations of mineral waters presents a novel case with which to view the transition from monarchy to republic. From one system to the next, there was continuity in matters of science, and in the need to impose a strict price list and code of conduct at the springs. But the revolution also led to much change in the administration of mineral waters. In particular, the new system enabled a redistribution of ownership rights, eventually leading to a broader re-evaluation of the question of property as it related to mineral waters. The initial struggle to adapt to the recent disappearance of privileges made space for a more entrepreneurial approach to the mineral water market. By examining these debates, my study has put forward an example of the effects of the revolution on the governance of French regions and their relationship to the centralised state.

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<sup>1519</sup> Christelle Rabier, “L’histoire de la médecine au prisme du marché: perspectives britanniques,” *Recherches britanniques* 1, no. 1 (2011).

<sup>1520</sup> On the connections between culture, censorship and the revolution, see: David Garrioch, *La Fabrique du Paris Révolutionnaire* (Paris: La Découverte, 2013).; Darnton, *The forbidden best-sellers of pre-revolutionary France*.; Arlette Farge, *Dire et mal dire, l’opinion publique au XVIIIe siècle* (Paris: Seuil, 1992).; Roger Chartier, *Les Origines culturelles de la Révolution française* (Le Seuil, 1990). On the question of policing in the late eighteenth century, see: Vincent Milliot, “L’admirable police”, *Tenir Paris au siècle des Lumières* (Paris: La Découverte, 2013).; Jean-Luc Laffont, “La police de voisinage à la base de l’organisation policière des villes de l’ancienne France,” *Annales de la recherche urbaine* (1999).; Paolo Piasenza, “Juges, lieutenants de police et bourgeois à Paris au XVIIe et XVIIIe siècles,” *Annales ESC* 5 (1990).

By making the rich social life of the mineral water market apparent, my research has also echoed an important field of eighteenth-century scholarship concerning the agency and social positioning of women in the period. Women represented the majority of patients at the spas, which held true regardless of social standing. The spas therefore hosted mixed crowds, and this was not limited to patients. With attempts to moralise spas, male and female patients had to be served by *baigneurs* and *baigneuses* of matching gender, meaning that women were employed in large numbers.<sup>1521</sup> Though the market was ruled by medical men, women were among the frequently overlooked workers, particularly as sellers of mineral waters. They provided a medical service and were even celebrated on occasion for their impartial knowledge of the remedies they were selling. Their livelihood could also become threatened by a process of institutionalisation which included an emphasis on formal knowledge which could only be learnt in all-male environments. The presence, and plights of women therefore reflects wider dynamics of gender roles in the Enlightenment, while highlighting lesser-known forms of agency of early modern women in matters of business and health.<sup>1522</sup>

An important subject of eighteenth-century historiography concerns the figure of the Enlightenment *savant*. My study, with its focus on the sciences, clearly inserts itself within this tradition. However, my approach highlights aspects of a more practical Enlightenment. Mineral water experts were no *philosophes*, and they rarely displayed the kind of diversity of interests found in some circles of the Enlightenment. The men of science studied here, mainly the analysts, the *Commission* members, and *Société* Associates, favoured applied knowledge of medicine and chemistry. Few of them frequented the salons, and they did not work in industry either. Despite this, they actively saw themselves as participants in the Republic of Letters, and regularly exchanged with national and international correspondents. Their celebration of Enlightenment themes, the likes of scientific progress and the yearning for universal knowledge, were integrated to the specific ambitions of their field. In that

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<sup>1521</sup> Lucie Henriët, *De la quête de santé par l'eau à la médecine des eaux : cohabitation entre médecins et villageois dans les établissements de bains de Basse-Auvergne (1772–1840)*, Upcoming.

<sup>1522</sup> On social approaches to the agency of women and gender roles in the eighteenth century, see: Janine Lanza, "Women Minding the Store in Eighteenth-Century France," *Early Modern Women: An Interdisciplinary Journal* 10, no. 1 (2015).; Smart Annie, *Citoyennes: Women and the Ideal of Citizenship in Eighteenth-Century France* (University of Delaware, 2011).; Daryl M. Hafter, "Women in the Underground Business of Eighteenth-Century Lyon," *Enterprise & Society* 2, no. 1 (2001).; Daryl M. Hafter, "Female Masters in the Ribbonmaking Guild of Eighteenth-Century Rouen," *French Historical Studies* 20, no. 1 (1997).; Dena Goodman, *The Republic of Letters, A cultural history of the French Enlightenment* (Ithaca: Cornell University Press, 1994).; Vivien Jones, ed., *Women in the Eighteenth Century, Constructions of Femininity* (London: Routledge, 1990).; Olwen Hufton, "Women without Men: Widows and Spinsters in Britain and France in the Eighteenth Century," *Journal of Family History* 9, no. 4 (1984).; Farge and Foucault, *Le désordre des familles*.

sense, the mineral water *savants* of my study contribute another facet to the image of the Enlightenment, corroborating the view that it can only be defined via its “polyphony”, or plurality of voices.<sup>1523</sup>

Lastly, the field of knowledge that my investigation contributes to the most, and occasionally challenges, is the field of eighteenth-century chemistry. The development of water chemistry, though a minor aspect in the overall history of the eighteenth century, is a major component of Enlightenment chemistry. My study has therefore added an important, and so far missing, chapter to the broader narrative of the developments of chemistry in France. Water analysis was widely performed, and relied on a steady supply of chemical products, vessels, and knowledge throughout the country in order to operate. Within the circles of analysts, chemical theory was applied, questioned, and developed, to an extent which is ignored by most scholarship on the subject. Analysts also contributed to changes within the practice of chemistry, proposing innovations to the experimental method and crafting new techniques and instruments for the improvement of analysis that could then be transferred to other applications within chemistry. In addition, the water analysts were largely unaffected by the events of the ‘chemical revolution’, despite clearly intersecting periodisation and areas of interest. My findings therefore challenge established milestones and assumptions regarding the development of chemistry, highlighting the extent of the contributions made by medical practitioners to the field.

Mineral waters of the eighteenth century affected different social circles and reflected key dynamics of the period. Moreover, they continue to challenge established narratives and provide alternative perspectives from which to view the development of medical markets, regulatory institutions, and science during the Enlightenment. In that way, despite their seemingly innocuous appearance, mineral waters vivify our conceptions of eighteenth-century societies.

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<sup>1523</sup> Lilti, “In the Shadow of the Public: Enlightenment and the Pitfalls of Modernity.”; Lilti, *L'Héritage des Lumières, Ambivalences de la modernité*, 29.

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I learned in my first weeks as a Ph.D student that a doctorate is not solely a process of book-writing. Its broader purpose is to teach a more or less clueless student how to become a researcher. During the past four and a half years, I have learned much about historical research, and the production of this thesis is largely the result of the lessons I have gleaned throughout the experience. Though I will defend this text alone, I will do so resting on the confidence gained from those who have been instrumental in teaching me the ropes of the historical discipline.

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# Bibliography

## Archival collections

### **Archives de l'Académie des Sciences, Belles Lettres, et Arts de Lyon,**

Ms 120, f254–257, f258–266, f284–287, f203–206, f279–280, f282–283, f288–289.

Ms 139 f69–71, Mémoire sur les eaux de Lyon, par Després Beauregard.

Ms pa 206, f1–4, f5–8, f9–10, f11–16, f27–30, f31–37, f38–f49, f50–53.

Ms 219 f294–297, Analyse de la source minérale d'Ambert.

Ms 258 f187–193, Rapport sur les eaux minérales factices, 13 Floréal An 9, par Gavinet.

Ms 273, f1–12, f19–f194, f184–196.

### **Archives départementales de la Haute Loire, Le Puy en Velay**

78 B 1, Cours et juridictions antérieures à 1789, *Arrêt de la Cour de Parlement de Toulouse, qui condamne le nommé Pierre Coulet à être brûlé pour crime de Poison, & qui fait un nouveau Règlement pour la vente du Poison, & autres Minéraux*, (Toulouse, de l'imprimerie de Noble J.A.H.M.B. Pijon, 1778).

### **Archives Municipales de la Ville de Vichy**

Série BB6, 1781–1790, Assemblées et Droits des intendants sur le transport des eaux minérales; venue d'Adélaïde - alias Marie-Adélaïde.

Série BB 6–CC 9, 1786, remboursements et venue de Victoire, Louise, Marie-Thérèse (Mesdames de France - Filles de Louis XV).

Séries DD 11, GG 9, 12, HH 2, Robert-Antoine Giraud.

Séries DD 11, GG 5, 6, 8, 9, 12, HH 2, II 1, Noms d'intendants.

Série DD11, 1781–1786, n°41, Création d'une nouvelle fontaine.

Séries GG 2, GG 3, 6, 8, Claude Fouet.

Série GG 8, Charles Bouerot, Emmanuel Tardy.

Série GG 12, 1687–An II, n°61, Remboursement.

Série HH1, XVIII<sup>e</sup> siècle, n°72, Rétablissement du marché.

Série HH2, 1727–1788, État et réparations à faire aux bains.

Série II, 1, 1707–1733, II 1, Baux à ferme de la vente et du transport des eaux minérales passés par l'hôpital à des particuliers.

Série II 1, Jacques-François Chomel.

Registre pour servir à enregistrer les étrangers qui logeront chez les aubergistes des Bains, qui boiront des eaux, 1792.

Dossier thématique Claude Fouet, (1645–1715).

Dossier thématique François Chomel, (1678–1756).

Dossier thématique Robert Antoine Giraud, (1735–1794).

### **Archives municipales de Lyon**

743 Wp 065, Eaux. Bonnes fontaines, bouches d'arrosage, bouches d'incendies, installation, An II (1793)–1886.

#### *Printed sources*

Marsonnat, M. de. “Les Eaux Minérales De Charbonnières, Dites De Laval, En Lyonnais.” A Lyon, de l'imprimerie de la ville, 1789.

Vitet. “Pharmacopée De Lyon Ou Exposition Méthodique Des Médicaments Simples Et Composés, De Leurs Caracteres, De Leurs Vertus, De Leur Préparation & Administration, & Des Especes De Maladies Où Ils Sont Indiqués.” Chez les Freres Perisse, Imprimeurs-Libraires, rue Mercier, 1778.

### **Archives Nationales, Paris and Pierrefitte-sur-Seine**

Série O/1, Maison du roi sous l'Ancien Régime (XVIe–XVIIIe siècles), 11 (fol. 288), 16 (fol. 141), 30 (fol. 254), 53 (fol. 181, 212), 59 (fol. 216), 62 (fol. 199), 63 (fol. 214), 68 (fol. 602, 604), 81 (fol. 303, 304), 87 (fol. 186–188, 399), 96 (fol. 265), 97 (fol. 156, 157), 114 (fol. 201), 116 (fol. 109), 117 (fol. 793), 118 (fol. 172, 332, 333), 121 (fol. 86).

Série F/14/1309, Tourbières, salines, eaux minérales (1753–1815).

Série AJ/16/6697, Académie de Paris. Faculté de médecine (an III–1940).

Série AJ/16/6698, Dossiers relatifs à l'enseignement et à la police des professions médicales au XIXe siècle (An III [1794]–1896).

Série AJ/16/930/A–B, Remèdes secrets, eaux minérales, Rapports 251–282.

Série H//86, Documents concernant le Béarn (1727–1790).

Série MC/ET, Études notariales, Paris, I/233, XV/697, XXXV/668, XCV/157, CV/1275, LXIV/373, LXXVII/236, CXV/741, CXV/744.

### **Bibliothèque André Malraux, Saint Briec**

Man. 106, Fourcroy, *Leçons de Buquet, chimie, Précis des leçons de Chymie de Feu M. Bucquet*, (ca. 1777).

### **Bibliothèque de l'Académie de Médecine, Paris**

*Papiers de la Commission pour l'examen des remèdes particuliers et la distribution des eaux minérales*

SRM 111A, 1772 (septembre)–1773 (juin), dossiers 2, 4, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20.

SRM 111B, 1773 (août)–1775 (septembre), dossiers 21, 22, 23, 26, 27, 28, 31, 32.

SRM 112, 1776 (février)–1777 (avril), dossiers 1, 3, 4, 5, 6, 7, 9, 14, 15, 16, 17, 18.

SRM 113, 1777 (mai)–1778 (octobre), dossiers 1, 2, 4, 5, 7, 10, 11, 12, 14, 15, 16, 17, 18, 19.

*Archives de la Société royale de médecine*

SRM 90A, (Luxeuil – Montignac-le-Comte), dossiers 2, 4, 7, 19.

SRM 90B, (Montpellier – Noyers), dossier 36.

SRM 91A, (Orléans – Pougues), dossiers 2, 3, 5, 7, 13.

SRM 91B, (Pouillon – Roye), dossiers 15, 17, 19, 20, 21, 22, 27, 32, 33.

SRM 92A, (Sagnes – Saint-Jouan), dossiers 4, 10, 15, 16, 18, 31, 32.

SRM 92B, (Ardèche – Saint-Juliac), dossiers 36, 39, 43, 45, 46, 47, 49.

SRM 93A, (Soultz et Strasbourg – Vic-Bigorre), dossiers 3, 6, 7, 12, 16, 19, 22.

SRM 93B, (Vichy – Youset), dossiers 24, 29, 30, 31, 32.

SRM 95, dossier 1.

SRM 114A et SRM 114B, Création, organisation et fonctionnement de la SRM, (1724–1793), dossiers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 19, 20, 21, 22.

SRM 115A, Comptabilité de la Commission royale de médecine. (1772–1778), dossiers 1, 6, 8.

**Bibliothèque Interuniversitaire de Paris, pôle Pharmacie, Paris**

Boîte AL / AL1, Etat des statuts, sentences, arrêts concernant la corporation des apothicaires (1632–1730), dressé par M. Boulduc pour être remis à M. Chirac, premier médecin du roi (années 1730).

Boîte AM / AM48, Compte récapitulatif et quittance de sommes dépensées pour le cours de chimie en 1793.

Boîte BJ / BJ24, BJ41.

Dossier 332–2.

Dossier 342, Pièces 1–21.

Dossier 345, fol. 59, 152, 154, 155, 157, 158.

Registre 2, pièces 19, 24.

Registre 3, pièce 99.

Registre 10, pièces 26, 82, 119, 121, 137, 184, 204.

Registre 13, pièces 49, 152.

Registre 15, fol. 107.

Registre 28, pièces 15, 37.

Registre 81, Registre d'inscriptions des élèves en pharmacie fréquentant les cours publics de chimie, Histoire Naturelle et Botanique du Collège de Pharmacie de Paris, 1778–1788.

Ms 106(5), Dossier préparatoire (1790).

## **Hagströmerbiblioteket, Karolinska Institutet, Stockholm**

### *Printed sources*

Chevalier, M. "Mémoires Et Observations Sur Les Effets Des Eaux De Bourbonne-Les-Bains, En Champagne, Dans Les Maladies Hystériques & Chroniques." A Paris, Chez Vincent, Imprimeur-Libraire, rue des Mathurins, Hôtel de Clugny, 1772.

Currie, James. "Medical Reports, on the Effects of Water, Cold and Warm: As a Remedy in Fever and Other Diseases, Whether Applied to the Surface of the Body, or Used Internally." Liverpool, printed by J. Creery, Houghton-Street, 1805.

Hoffmann, Friedrich. "Analyse Parfaite Des Eaux De La Fontaine Du Bas Selter, Traduit De L'allemand En François Par Pierre-Théodore Leveling." A Nancy, Imprimerie de la veuve Cusson, 1791.

Venel, Gabriel François, and Pierre Bayen. "Analyses Chimiques Des Nouvelles Eaux Minérales, Vitrioliques, Ferrugineuses, Decouvertes a Passy Dans La Maison De Madame De Calsabigi. Avec Les Propriétés Medicinales De Ces Mêmes Eaux, Fondées Sur Les Observations Des Médecins & Chirurgiens Des Plus Célèbres, Dont on Rapporte Les Certificats Authentiques." 1757.

## **The Donald F. and Mildred Topp Othmer Library of Chemical History, Philadelphia**

### *Printed Sources*

RS67.F7 F676 1783. "Formules De Médicaments, Usitées Dans Les Différens Hopitaux De Paris; Avec Leurs Vertus, Leurs Usages & Leurs Doses." à Paris, Chez Méquignon aîné, 1783.

QC253.C383 1739. Bordeu, Théophile de. "Dissertation Sur Les Eaux Minérales Du Bearn : Ou Lettre De M. De Bordeu Pere, Médecin De Pau, À Monsieur Chicoyneau, Au Sujet Des Eaux Bonnes, Et Des Eaux Chaudes De La Vallée D'ossau En Bearn." Paris, G.F. Quillau, pere, 1750.

RM674.B695. Boyle, Robert. "Short Memoirs for the Natural Experimental History of Mineral Waters : Addressed by Way of Letter to a Friend." London: Printed for Samuel Smith, 1684.

QC253.C383 1739. Cavallery, Antoine. "Dissertation Sur La Cause De La Chaleur Et De La Froideur Des Eaux Minérales : Qui a Reimporté Le Prix, Au Jugement De L'academie Royale Des Belles Lettres, Sciences Et Arts, Par

Le R.P. Antoine Cavallery, De La Compagnie De Jesus.” Bordeaux, Pierre Brun, 1739.

RA674.D834 1780. Duchanoy, Claude François. “Essais Sur L'art D'imiter Les Eaux Minérales, Ou De La Connaissance Des Eaux Minérales, Et De La Manière De Se Les Procurer En Les Composant Soi-Même Dans Tous Les Tems Et Dans Tous Les Lieux.” A Paris, Chez Méquignon l'aîné, Libraire, rue des vis-à-vis S. Côme, 1780.

RA864.V6 F684 1679. Fouet, Claude. “Le Secret Des Bains Et Eaux Minérales De Vichy En Bourbonnois : Dans Lequel Sont Contenuës Beaucoup De Recherches Et Pensées Curieuses Utiles Et Necessaires Pour Les Malades Qui Ont Besoin Des Eaux Minérales En Général.” Chez la veuve d'Olivier de Varennes, 1679.

RM674.F684 1686. Fouet, Claude. “Nouveau Systeme Des Bains Et Eaux Minérales De Vichy, Fondé Sur Plusieurs Belles Experiences, & Sur La Doctrine De L'acide & De L'alcaly.” A Paris, chez Robert Pepie, rue S Jacques, 1686.

TN405.F8.F687 1779. Fourcy. “Analyse Des Eaux Alkalino-Martiales De Trye-Le-Chateau Avec L'exposition De Leurs Propriétés Faite Par M. Fourcy, Faite Sous Les Yeux De M. Raulin.” publiée par M. Pelvilain, à Amsterdam, et se trouve à Paris chez Fr. Valade, 1779.

QD28.L386 1774b. Lavoisier, Antoine Laurent de. “Opuscules Physiques Et Chymiques.” à Paris, Chez Durand neveu, 1774.

RA848.L563 1754. Limbourg, Jean Philippe de. “Traité Des Eaux Minérales De Spa.” À Leide, De l'inpr. d'Elie Luzac, fils, 1754.

RA864.F6 L563. Linand, Barthélémy. “Lettre De Me. Barthelemy Linand Docteur En Medecine Écrite À M Le 15. Octobre 1696 Où Il Répond À Quelques Objections Qu'on a Faites Contre Son Livre Des Eaux Minérales De Forges.” A Paris, Chez la veuve de Charles Coignard, 1696.

TN405.F8 D463. Machy, Jacques François de. “Examen Physique Et Chimique D'une Eau Minérale Trouvée Chez M. De Calsabigi À Passy, Comparée Aux Eaux Du Même Côteau Connues Sous Le Nom Des Nouvelles Eaux Minérales De Mme Belami.” 1756.

RA864.P3 M685 1723. Marguery, Moullin de. “Traité Des Eaux Minérales Nouvellement Découvertes Au Village De Passy, Près Paris.” A Paris, chez François Barois, ruë de la Harpe, vis-à-vis le College de Harcour, à la Ville de Nevers, 1723.

RS78.P588 1703. Pitt, Rob. "The Craft and Frauds of Physick Expos'd : The Very Low Prices of the Best Medicines Discover'd. The Costly Medicines, Now in Greatest Esteem, Such as Bezoar, Pearl, &C. As Also the Distill'd Waters, Censur'd. And the All Too Frequent Use of Physick Prov'd Destructive to Health. With Instructions to Prevent Being Cheated and Destroy'd by the Prevailing Practice." London : Printed for T. Childe, 1703.

TP625.P75414 1772. Priestley, Joseph. "Manière D'imprégner L'eau D'air Fixe, Et De Lui Communiquer Les Propriétés De L'eau De Pymont, Et De Toutes Les Eaux Minérales Qui Sont Connues Sous El Nom D'acidules Ou Aériennes." 1772.

RA866.R385 1777. Raulin, Joseph. "Parallèle Des Eaux Minérales D'Allemagne : Et De Celles De La Même Nature Qui Sourdent Dans Le Royaume, Avec Des Remarques Sur L'analyse Des Eaux Minérales En Général, Fait Par Ordre Du Gouvernement." Imprimerie royale, 1777.

RA848.R877 1757. Ruty, John. "An Essay Towards a Natural, Experimental and Medicinal History of the Mineral Waters of Ireland : Wherein the Several Impregnating Minerals, Being Investigated by a Series of Experiments, Each Water Is Reduced to Its Proper Class. The Virtues of Such as Have Been Used Are Given from Practical Observations : Divers New Waters, Especially of the Sulphureous and Vitriolic Kind, Are Enumerated and More Accurately Described Than Hitherto. The Whole Illustrated with Tables Exhibiting a Clear View of the Experiments in Concert, and a Comparison of the Irish to the English, and Other Foreign Waters." Dublin, Printed for the author, 1757.

RA850.S468 1765. Short, Thomas. "A General Treatise on Various Cold Mineral Waters in England : But More Particularly on Those at Harrogate, Thorp-Arch, Dorsthill, Wigglesworth, Nevillholt, and Others of the Like Nature, with Their Principles, Virtues, and Uses. Also, a Short Discourse on Solvents of the Stone in the Kidneys and Bladder." London, Printed for the author and sold by A. Millar, 1765.

TN405.F8 T468 1774. Thouvenel, Pierre. "Mémoire Chymique Et Médicinal Sur Les Principes Et Les Vertus Des Eaux Minérales De Contrexeville En Lorraine." A Nancy, chez Babin, Imprimeur Libraire, à Paris chez Valade, Libraire, 1774.

## Archival references of the database entries

Ambert, Analysis of the waters of Ambert by Laprade, (ca. 1778), Ms pa 206, f50-53, AAL.

Availles, Analysis of the waters of Availles, (1777), SRM 112, dossier 14, ASRM.

Aveiron, Analysis of the waters of the Aveiron by Caucanas, (1802), AJ/16/6697, AN.

Ax, Analysis of the waters of Ax by Chaussier and Deyeux, (1803), AJ/16/6698, AN.

Bain de Rennes, Analysis of the waters of Bain de Rennes by Soulere, (1778), SRM 113, dossier 12, ASRM.

Barbotan, Analysis of the waters of Barbotan by Dufau, (1776), SRM 112, dossier 9, ASRM.

Barèges, Analysis of the waters of Barèges by Montesquiou, (1747), Ms pa 206, f9-10, AAL.

Bas Selter. Hoffmann, Friedrich. "Analyse Parfaite Des Eaux De La Fontaine Du Bas Selter, Traduit De L'allemand En François Par Pierre-Théodore Leveiling." A Nancy, Imprimerie de la veuve Cusson, 1791.

Bouillaut, Analysis of the waters of Bouillaut by Fleury l'Aîné, (1776), SRM 91B, dossier 33, ASRM.

Bourbonne, Baudry, M. . "Traité Des Eaux Minérales De Bourbonne Les Bains, Contenant Une Explication Metodique Sur Tous Leurs Usages." Chez J. Sirot, Imprimeur Libraire, Place Saint Etienne, 1736.

Bourbonne-les-Bains, Chevalier, M. "Mémoires Et Observations Sur Les Effets Des Eaux De Bourbonne-Les-Bains, En Champagne, Dans Les Maladies Hystériques & Chroniques." A Paris, Chez Vincent, Imprimeur-Libraire, rue des Mathurins, Hôtel de Clugny, 1772.

Bugey, Analysis of the waters of Bugey, (1756), Ms pa 206, f31-37, AAL.

Bussang, Analysis of the waters of Bussang by Courtois, (1778), SRM 112, dossier 7, ASRM.

Bussang 2, Lemaire, J. "Essai Analitique Sur Les Eaux De Bussang." A Remiremont, chez C. Nicolas-Emmanuel Laurent, Imprimeur Ordinaire de la Ville & Marchand Libraire, 1750.

Capbern, Analysis of the waters of Capbern by Brun, (1778), SRM 113, dossier 12, ASRM.

Charbonnières, Marsonnat, M. de. "Les Eaux Minérales De Charbonnières, Dites De Laval, En Lyonnais." A Lyon, de l'imprimerie de la ville, 1789.

Contrexéville, Thouvenel, Pierre. "Mémoire Chymique Et Médicinal Sur Les Principes Et Les Vertus Des Eaux Minérales De Contrexéville En Lorraine." A Nancy, chez Babin, Imprimeur Libraire, à Paris chez Valade, Libraire, 1774.

Donzy, Analysis of the waters of Donzy by Paret, (1782), SRM 92A, dossier 4, ASRM.

Enghien, Fourcroy, Antoine François de. "Analyse Chimique De L'eau Sulfureuse D'enghien, Pour Servir a L'histoire Des Eaux Sulfureuses En Général." A Paris, Chez Cuchet, Libraire, rue & hôtel Serpente, 1788.

Enghien 2, Ibid, Chapitre 2, 1766. (Analysis by Macquer and Cotte).

Enghien 3, Ibid, Chapitre 2. 1771. (Analysis by Veillard).

Enghien 4, Ibid, Chapitre 2. 1774. (Analysis by Deyeux).

Enghien 5, Ibid, Chapitre 2. 1774. (Analysis by Roux & Commissaries).

Forez, Analysis of the waters of the Forez by Laprade, (earliest 1772), Ms 120, f254-257, AAL.

Habsbourg, Analysis of the waters of Habsbourg by Morell, (1788), SRM 93B, dossier 34, ASRM.

Haute Rive, Analysis of the waters of Haute Rive by Godin, (1743), Ms pa 206, f11-16, AAL.

La Touche, Analysis of the waters of La Touche by Gallot, (1784), SRM 91A, dossier 13, ASRM.

Labatisse, Analysis of the waters of Labatisse by Cuel, (1782), SRM 92B, dossier 43, ASRM.

Lauben, Analysis of the waters of Lauben by Tingry, (1802), AJ/16/6697, AN.

Mammont, Analysis of the waters of Mammont by Chaussier and Deyeux, (1809), AJ/16/6698, AN.

Manosque, Analysis of the waters of Manosque by Bouteille, (between 1780 and 1793), SRM 90A, dossier 4, ASRM.

Martres, Analysis of the waters of Martres by Cuel, (1780), SRM 90A, dossier 7, ASRM.

Monestier, Analysis of the waters of Monestier, (1775), SRM 90A, dossier 19, ASRM.

Montbrison, Analysis of the waters of Montbrison by Gavinet, (1763), Ms 120, f284-287, AAL.

Montbrison 2, Analysis of the waters of Montbrison by Laprade, (1773), Ms 120, f284-287, AAL.

Montmorency, Analysis of the waters of Montmorency by Veillard, (1777), SRM 113, dossier 1, ASRM.

Nievstin, Analysis of the waters of Nievstin by the Société des Sciences of Mont Tonerre, (1803), AJ/16/6698, AN.

Noyers, Analysis of the waters of Noyers by Gastellier, (1787), SRM 90B, dossier 36, ASRM.

Orliénas, Analysis of the waters of Orliénas by Lanoix, (1778), Ms 120, f203-206, AAL.

Orliénas 2, Analysis of the water of Orliénas by Tissier, (1778), SRM 91A, dossier 2, ASRM.

Passy, Marguery, Moullin de. "Traité Des Eaux Minerales Nouvellement Découvertes Au Village De Passy, Près Paris." A Paris, chez François Barois, ruë de la Harpe, vis-à-vis le College de Harcour, à la Ville de Nevers, 1723.

Passy 2, Deyeux, Nicolas. "Analyse Des Nouvelles Eaux Minérales De Passy, Communiquée À L'école De Médecine De Paris." Extrait de la collection des mémoires de cette école, dont le premier volume paraîtra incessamment, à Paris, chez Méquignon l'ainé, 1808.

Passy 3, Venel, Gabriel François, and Pierre Bayen. "Analyses Chimiques Des Nouvelles Eaux Minérales, Vitrioliques, Ferrugineuses, Decouvertes a Passy Dans La Maison De Madame De Calsabigi. Avec Les Propriétés Medicinales

De Ces Mêmes Eaux, Fondées Sur Les Observations Des Médecins & Chirurgiens Des Plus Célèbres, Dont on Rapporte Les Certificats Authentiques.” 1757.

Passy 4, Ibid, 1753, (Analyse de Rouelle).

Passy 5, Ibid, 1757, (Analysis by Cadet).

Passy 6, Analysis of the waters of Passy by Vicq d’Azyr and eight commissaries of the Société, (1784), SRM 91A, dossier 5, ASRM.

Passy 7, Machy, Jacques François de. “Examen Physique Et Chimique D'une Eau Minérale Trouvée Chez M. De Calsabigi À Passy, Comparée Aux Eaux Du Même Côteau Connues Sous Le Nom Des Nouvelles Eaux Minérales De Mme Belami.”, 1756.

Plombières, Calmet, Dom. “Traité Historique Des Eaux Et Bains De Plombières, De Bourbonne, De Luxueil, Et De Bains.” A Nancy, chez Lesseure, Imprimeur ordinaire du Roi, 1768.

Plombières 2, Ibid.

Poüet, Analysis of the waters of Pouët by Gallot, (1784), SRM 91A, dossier 13, ASRM.

Pouillon, Analysis of the waters of Pouillon by Massie, (1779), SRM 91B, dossier 15, ASRM.

Pouzaugues, Analysis of the waters of Pouzaugues by Gallot, (1784), SRM 91A, dossier 13, ASRM.

Prémeaux, Analysis of the waters of Prémeaux by Maret, (between 1779 and 1787), SRM 91B, dossier 17, ASRM.

Pyrénées, Analysis of the waters of the Pyrenees, (1778), SRM 113, dossier 10, ASRM.

Quercy, Analysis of the waters of Quercy by Bertrand-Lagrésie, (1777), SRM 91A, dossier 7, ASRM.

Quercy 2, Analysis of the waters of Quercy by Perret, (1775), SRM 111B, dossier 26, ASRM.

Rainsy, Analysis of the waters of Rainsy by de Horne, (between 1779 and 1787), SRM 91B, dossier 20, ASRM.

Riboulet, Analysis of the waters of Riboulet by Bo and Bougues, (1779), SRM 91B, dossier 21, ASRM.

Recques, Analysis of the waters of Recques by Souquet, (1786), SRM 91B, dossier 22, ASRM.

Rochefort, Analysis of the waters of Rochefort by by Grignon, (latest 1775), SRM 91B, dossier 27, ASRM.

Rouen, Analysis of the waters of Rouen by Bollioud, (1745), Ms pa 206, f27-30, AAL.

Roye, Analysis of the waters of Roye by Lassone and Cadet, (earliest 1770), SRM 91B, dossier 32, ASRM.

Sail sous Couzan, Analysis of the waters of Sail sous Couzan by Laprade, (1775), Ms 120, f279-280, AAL.

Saint Alban, Analysis of the waters of Saint Alban by Laprade, earliest (1772), Ms 120, f254-257, AAL.

Saint Alban 2, Analysis of the waters of Saint Alban by Rostain, (between 1779 and 1785), SRM 92A, dossier 18, ASRM.

Saint Galmier, Analysis of the waters of Saint Galmier by Laprade, (1774), Ms 120, f282-283, AAL.

Saint Honoré, Analysis of the waters of Saint Honoré by Regnault, (between 1784 and 1787), SRM 92A, dossier 31, ASRM.

Saint Jouan, Analysis of the waters of Saint Jouan by Chifoliau, (1780), SRM 92A, dossier 32, ASRM.

Saint Martin, Analysis of the waters of Saint Martin by Cadet de Vaux, (1776), SRM 92 B, dossier 39, ASRM.

Saint Nectaire, Analysis of the waters of Saint Nectaire by Cuel, (1782), SRM 92B, dossier 43, ASRM.

Saint Santin, Analysis of the waters of Saint Santin by la Martinière, (1778), SRM 92B, dossier 47, ASRM.

Saint Suliac, Analysis of the waters of Saint Suliac by Chifoliau, (1780), SRM 92 B, dossier 49, ASRM.

Saint Suliac 2, Analysis of the waters of Saint Suliac by Chifoliau, (1781), SRM 92 B, dossier 49, ASRM.

Sainte Reine, Analysis of the waters of Sainte Reine by Doucet, (1760), SRM 92 B, dossier 46, ASRM.

Sainte Reine 2, Analysis of the waters of Sainte Reine by Duclos, (1671), SRM 92 B, dossier 46, ASRM.

Sainte Reine 3, Analysis of the waters of Sainte Reine by Maret, (1781), SRM 92B, dossier 46, ASRM.

Sainte Reine 4, Analysis of the waters of Sainte Reine by Fourcroy, (1781), SRM 92B, dossier 46, ASRM.

Segray, Analysis of the waters of Segray by Latronçay, (ca. 1780), SRM 92A, dossier 10, ASRM.

Spa, Limbourg, Jean Philippe de. "Traité Des Eaux Minérales De Spa." À Leide, De l'inpr. d'Elie Luzac, fils, 1754.

Sultzbach, Analysis of the waters of Sultzbach by Beltz, (1784), SRM 92A, dossier 15, ASRM.

Sultzmatt, Méglin, M. J. A. "Analyse Des Eaux Minérales De Sultzmatt En Haute Alsace." de l'imprimerie Jean Henri Heitz, Impri. de l'Univ., 1779.

Tautavel, Analysis of the waters of Tautavel by Carcassonne, (1783), SRM 93A, dossier 3, ASMR.

Trye-le-Château, Fourcy. "Analyse Des Eaux Alkalino-Martiales De Trye-Le-Chateau Avec L'exposition De Leurs Propriétés Faite Par M. Fourcy, Faite Sous Les Yeux De M. Raulin." publiée par M. Pelvilain, à Amsterdam, et se trouve à Paris chez Fr. Valade, 1779.

Uriage, Analysis of the waters of Uriage by Nicolas, (1783), SRM 93A, dossier 12, ASRM.

Uriage 2, Analysis of the waters of Uriage by Bernardin, (1781), SRM 93A dossier 12, ASRM.

Usat, Analysis of the waters of Usat by Becane, (1771), SRM 111A dossier 16, ASRM.

Vallers, Analysis of the waters of Vallers by Linacier, (1777), SRM 93A, dossier 16, ASRM.

Vals Marquise, Analysis of the waters of Vals by Laprade, (earliest 1775), Ms 120, f288-289, AAL.

Veaugarni, Analysis of the waters of Veaugarni by Chifoliau, (1780), SRM 93A, dossier 19, ASRM.

Veaugarni 2, Analysis of the waters of Veaugarni by Chifoliau, (1783), SRM 93A, dossier 19, ASRM.

Vic sur Cère, Analysis of the waters of Vic sur Cère by Esquirou, (1718), SRM 93A, dossier 2, ASRM.

Vitry le François, Analysis of the waters of Vitry le François by Grosse, (1738), SRM 93B, dossier 29, ASRM.

Vots Douvse, Analysis of the waters of Vots Douvse by Cuel, (1780), SRM 90 A, dossier 7, ASRM.

## Media resources

Chagnon, Arnault. “Les Origines Du Thermalisme.” *L’internaute*, 2005.

Daston, Lorraine. “Historicizing the Self-Evident: An Interview with Lorraine Daston.” By Jack Gross. *Los Angeles Review of Books*. 2020.

Luneau, Aurélie. *Aux Sources Du Thermalisme : L’histoire D’une Médecine D’avenir ?* Podcast audio. *La marche des sciences*, 2015.

## Online resources

“Bicentenaire De L’académie Nationale De Médecine : 1820–2020.” Académie Nationale de Médecine, 2020, <https://www.academie-medecine.fr/bicentenaire/?lang=en>. (Accessed August 16<sup>th</sup> 2021).

“La carte de Cassini (1756–1815)”, Gallica, Bibliothèque Nationale de France, <https://gallica.bnf.fr/html/und/cartes/france-en-cartes/la-carte-de-cassini?mode=desktop>. (Accessed March–August 2021).

Project page, “TCVPyr, programme de recherche européen (FEDER) pour un inventaire du patrimoine bâti et du patrimoine culturel immatériel de la vil-  
légature et du thermalisme dans le massif pyrénéen français (2017–2020)”.  
<http://tcvpyr.iutbayonne.univ-pau.fr> (Accessed August 4<sup>th</sup> 2021).

Project page, “The European Spa as a Transnational Public Space and Social Metaphor (2019–2022)”. <https://www.theeuropeanspa.eu/project/index.html> (Accessed July 7<sup>th</sup> 2021).

Project page, “Water cultures, the water cultures of Italy, 1500–1900”. <https://pric.unive.it/projects/water-cultures/home> (Accessed September 2<sup>nd</sup> 2021).

## Unpublished student theses

Antonelli, Francesca. “Scrittura, Sociabilità E Strategie Di Persuasione: Marie-Anne Paulze-Lavoisier, Secrétaire (1758–1836).” Dottorato di ricerca in Philosophy, science, cognition, and semiotics, Università di Bologna, 2021.

Carrion, Carole. “Du Thermalisme Mondain Au Thermalisme Social ? : Les Villes D’eaux Françaises Dans L’entre-Deux-Guerres (1919–1939).” Université Bordeaux Montaigne, 2001.

Erfurt, Patricia J. “An Assessment of the Role of Natural Hot and Mineral Springs in Health, Wellness and Recreational Tourism.” Ph.D Thesis, James Cook University, 2011.

Hannaway, Caroline C. “Medicine, Public Welfare and the State in Eighteenth Century France: The Société Royale De Médecine of Paris (1776–1793).” Ph.D, Johns Hopkins University, 1974.

Lehman, Christine. “Gabriel-François Venel (1723–1775) : Sa Place Dans La Chimie Française Du Xviii Siècle.” Thèse de doctorat, Université Paris-X - Nanterre, 2006.

Mandelkern, India Aurora. “The Politics of the Palate: Taste and Knowledge in Early Modern England.” Dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in History, University of California, 2015.

Moulin, Léopold. “Surveiller Et Prévoir : Climats Et Maladies Selon La Société Royale De Médecine (1776–1793).” Mémoire de Civilisation des Temps modernes Master 2, Université Paris-Sorbonne, 2016–2017.

Moussy, Hugues. “Les Topographies Médicales Françaises Des Années 1770 Aux Années 1880, Essai D’interprétation D’un Genre Médical.” Université Paris 1 - Panthéon Sorbonne, 2003.

Rondard, Julien. “La Société Royale De Médecine Et La Question Des Remèdes Secrets (1778–1793), De L’empirisme Vertueux Au Charlatanisme Effronté, Tentatives De Régulation D’un Marché.” Mémoire de master, Paris 1 Panthéon-Sorbonne, 2010–2011.

Simonetta, Marie Laure épouse Barrault. “La Société Royale De Médecine 1776–1793.” Mémoire de Maîtrise, 1992.

## Published sources and literature

*A Dictionary of Public Health*. Oxford University Press, 2007.

*Le dictionnaire de l'Académie française*. A Paris, Vve J. B. Coignard et J. B. Coignard, 1694.

*Dictionnaire de l'Académie française*. Chez la Veuve de Bernard Brunet, Imprimeur de l'Académie Française, Grand'Salle du Palais, & rue basse des Ursins, 1762.

Adams, Janes M. *Healing with Water: English Spas and the Water Cure, 1840–1960*. Manchester: Manchester University Press, 2015.

Agnarsdóttir, Anna, ed. *Joseph Banks, Iceland and the North Atlantic 1772–1820, Journals, Letters and Documents*, vol. 3: Hakluyt Society, 2016.

Agnew, Jeremy. *Healing Waters: A History of Victorian Spas*. McFarland & Company, 2019.

Ahnfelt, Nils-Otto, Hjalmar Fors, and Karin Wendin. “Historical Continuity or Different Sensory Worlds? What We Can Learn About the Sensory Characteristics of Early Modern Pharmaceuticals by Taking Them to a Trained Sensory Panel.” *Wissenschaftsgesch* 43 (2020): 412–29.

Alder, Ken. “French Engineers Become Professionals, or, How Meritocracy Made Knowledge Objective.” In *The Sciences in Enlightened Europe*, edited by William Clark, Jan Golinski and Simon Schaffer, 94–125. Chicago: University of Chicago Press, 1999.

———. “Making Things the Same: Representation, Tolerance and the End of the Ancien Regime in France.” *Social Studies of Science* 28, no. 4 (1998): 499–545.

Alléon-Dulac, Jean Louis. “Mémoires Pour Servir À L'histoire Naturelle Des Provinces De Lyonnais, Forez Et Beaujolais.” Chez Claude Cizeron, Libraire, à la descente du Pont de pierre, du côté de St. Nizier, 1765.

Andreozzi, Daniele. “Respectabilité Et Confiance Au Travers De La Norme Et De La Fraude, Le Cas De Trieste Au Xviiiè siècle.” *Rives méditerranéennes* 49 (2014): 81–98.

Annie, Smart. *Citoyennes: Women and the Ideal of Citizenship in Eighteenth-Century France*. University of Delaware, 2011.

Arbellot, Guy. “La Grande Mutation Des Routes De France Au Xviiiè Siècle.” *Annales, Économie, Société, Civilisation* 28, no. 3 (1973): 765–91.

- Authier, André, Pierre Duvernois, and Christophe Lefébure. *Patrimoine Et Traditions Du Thermalisme*. Vol. 1, Toulouse: Privat, 1997.
- Babich, B. E. “From Fleck’s ‘Denkstil’ to Kuhn’s Paradigm: Conceptual Schemes and Incommensurability.” *International Studies in the Philosophy of Science* 29, no. 1 (2003): 1–39.
- Back, William, Edward R. Landa, and Lisa Meeks. “Bottled Water, Spas, and Early Years of Water Chemistry.” *Groundwater* 33, no. 4 (1995): 532–685.
- Badash, Lawrence. “Joseph Priestley’s Apparatus for Pneumatic Chemistry.” *Journal of the History of Medicine and Allied Sciences* 19, no. 2 (1964): 139–55.
- Balaram, P. “Oxygen, Lavoisier and Revolution.” *Current Science* 83, no. 8 (2002): 925–36.
- Balcou, Jean. “Deux Philosophes Aux Eaux. De Voltaire À Diderot.” In *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*, edited by Annick Cossic and Patrick Galliou, 227–38. Newcastle: Cambridge Scholar Press, 2006.
- Baldit, Michel Silvestre de Marcillac, évêque de Mende. “L’hydrothermopatie Des Nymphes De Bagnols En Gevaudan : Ou Les Merveilles Des Eaux & Des Bains De Bagnols. Recogneuë & Averé.” Lyon, Jean Huguetan, 1651.
- Baubérot, Arnaud. “Chapter Iii: Les Vicissitudes De L’hydrothérapie En France.” Chap. 380 In *Histoire Du Naturisme: Le Mythe Du Retour À La Nature*, edited by Arnaud Baubérot. Rennes: Presses universitaires de Rennes, 2004.
- Baudry, M. . “Traité Des Eaux Minérales De Bourbonne Les Bains, Contenant Une Explication Metodique Sur Tous Leurs Usages.” Chez J. Sirot, Imprimeur Libraire, Place Saint Etienne, 1736.
- Bell, David A. “The ‘Public Sphere,’ the State, and the World of Law in Eighteenth-Century France.” *French Historical Studies* 17, no. 4 (1992): 912–34.
- Belmas, Élisabeth. “Les « amusements Des Eaux » Dans La Littérature Thermale Du Xviiiè siècle.” In *Le Thermalisme: Approches Historiques Et Archéologiques D’un Phénomène Culturel Et Médical*, 253–74. Paris: CNRS Éditions, 2015.
- Benedetto, Anthony V. Millikan, and Larry E. “Mineral Water and Spas in the United States.” [In eng]. *Clin Dermatol* 14, no. 6 (Nov–Dec 1996): 583–600.
- Bensaude-Vincent, Bernadette. “A Founder Myth in the History of Science? The Lavoisier Case.” In *Functions and Use of Disciplinary Histories*, edited by Loren Graham, Wolf Lepenies and Peter Weingart, 53–178, 1983.
- . *Lavoisier: Mémoires D’une Révolution*. Paris: Flammarion, 1993.

- . “Le Corps Refoulé Des Chimistes.” In *Essais D'histoire Et De Philosophie De La Chimie*, edited by Bernadette Bensaude-Vincent, 65–76. Nanterre: Presses Universitaires de Paris Nanterre, 2008.
- Bensaude-Vincent, Bernadette, and Jonathan Simon. *Chemistry, the Impure Science*. Imperial College Press, 2008.
- Bergman, Torbern. “Physical and Chemical Essays.” London, Printed for J. Murray, n°32, Fleet-Street; and William Creech, Edinburgh, 1784.
- Béroujon, Anne. *Peuple Et Pauvres Des Villes Dans La France Moderne, De La Renaissance À La Révolution*. Paris: Armand Colin, 2014.
- Bertucci, Paola. *Artisanal Enlightenment, Science and the Mechanical Arts in Old Regime France*. New Haven: Yale University Press, 2017.
- Beyer, Antoine. “Les Grands Jalons De L’histoire Des Voies Navigables Françaises.” *Pour mémoire, revue des ministères de l’environnement, de l’énergie et de la mer* 17 (2016): 83–93.
- Biard, Michel, Jean-Numa Ducange, and Jean-Yves Frégné. *Centralisation Et Fédéralisme - Les Modèles Et Leur Circulation Dans L'espace Européen Francophone, Germanophone Et Italophone*. Rouen: Presses Universitaires de Rouen, 2018.
- Bivins, Roberta. *Alternative Medicine?: A History*. Oxford University Press, 2010.
- Blot-Maccagnan, Stéphanie. *Procédure Criminelle Et Défense De L'accusé À La Fin De L'ancien Régime : Etude De La Pratique Angevine*. Rennes: Presses Universitaires Rennes, 2010.
- Boantza, Victor D. *Matter and Method in the Long Chemical Revolution: Laws of Another Order*. Routledge, 2016.
- Boantza, Victor D., and Leslie Tomory. “The “Subtile Aereal Spirit of Fountains”: Mineral Waters and the History of Pneumatic Chemistry.” *Early Science and Medicine* 21 (2016): 303–31.
- Boisseuil, Didier. *Le Thermalisme En Toscane À La Fin Du Moyen Âge: Les Bains Siennois De La Fin Du Xiiiè Siècle Au Début Du Xvie Siècle*. Rome: Publications de l’École française de Rome, 2002.
- Bol, Marjolijn. “Coloring Topazes, crystals And moonstones: The Making and Meaning of Factitious Gems, 300–1500.” In *F for Fakes: hoaxes, Counterfeits and Deception in Early Modern Science*, edited by Marco Beretta and Maria Conforti, 108–29. Sagamore Beach: Science History Publications, 2014.
- Borel, Philippe. “Comprendre L’enquête De La Société Royale De Médecine (1774–1793) Source, Problème Et Méthodologie.” *Histoire des Sciences Médicales* XXXIX, no. 1 (2005): 34–45.
- Borsay, Anne. *Medicine and Charity in Georgian Bath: A Social History of the General Infirmary, C.1739–1830*. Routledge, 2019.
- Bourdieu, Pierre. *Méditations Pascalienues*. Paris: Seuil, 2003. 1997.
- Boury, Dominique. “Théophile De Bordeu : Source Et Personnage Du Rêve De D’alembert.” *Recherches sur Diderot et sur l'Encyclopédie* 34 (2003).

- Bouvet, Maurice. "Un Remède Secret Du Xviii Siècle : Le Rob Boyveau-Laffeteur." *Bulletin de la Société d'histoire de la pharmacie* 11, n° 39 (1923): 264–72.
- Brennan, Thomas Edward. *Public Drinking and Popular Culture in Eighteenth-Century Paris*. Princeton Legacy Library, 1988.
- Bret, Patrice. "Du Laboratoire De L'académie De Dijon À Celui De L'école Polytechnique : Trente-Six Ans D'enseignement De La Chimie." *Bulletin de la Sabix* (2017): 9–36.
- . "The Letter, the Dictionary and the Laboratory: Translating Chemistry and Mineralogy in Eighteenth-Century France." *Annals of Science* 73, no. 2 (2014): 122–42.
- Brockliss, Laurence W. "The Development of the Spa in Seventeenth-Century France." *Medical History*, n° 10 (1990): 23–47.
- Buc'hoz, Pierre-Joseph. "Dictionnaire Des Eaux Minérales: Contenant Leur Histoire Naturelle, Des Observations Générales Et Des Notices Particulières Sur Différentes Fontaines : Une Bibliographie Hydrologique, Etc." A Paris, Rue Saint-Jean-de-Beauvais, la premiere cochere au-dessus du College, 1775.
- Buchan, Guillaume. "Médecine Domestique Ou Traité Complet Des Moyens De Se Conserver En Santé, De Guérir Et De Prévenir Les Maladies, Par Le Régime Et Les Remèdes Simples." A Paris, Chez Froullé, Libraire, Pont Notre-Dame, vis-à-vis le Quai de Gesvres, 1792.
- Bucquet, Jean Baptiste Michel. "Introduction À L'étude Du Règne Minéral." Paris, Jean-Th. Herissant Père, 1771.
- . "Introduction À L'étude Du Règne Minéral." Paris, ed. Jean Th. Hérissant père, 1771.
- Bugnot, Marie-Ange. "Le Prototourisme Médical : Le Thermalisme Sous Le Second Empire." In *Patrimoine Et Traditions Du Thermalisme*, edited by André Authier and Pierre Duvernois. Toulouse: Privat, 1997.
- Bullard, Loring. *Healing Waters: Missouri's Historic Mineral Springs and Spas*. Columbia, London: University of Missouri Press, 2004.
- Bycroft, Michael. "Iatrochemistry and the Evaluation of Mineral Waters in France, 1600–1750." *Bulletin of the History of Medicine* 91, no. 2 (2017): 303–30.
- Cadet. "Analyse Chimique." In *Analyses Chimiques Des Nouvelles Eaux Minérales, Vitrioliques, Ferrugineuses, Découvertes a Passy Dans La Maison De Madame De Calsabigi. Avec Les Propriétés Medicinales De Ces Mêmes Eaux, Fondées Sur Les Observations Des Médecins & Chirurgiens Des Plus Célèbres, Dont on Rapporte Les Certificats Authentiques*, edited by Gabriel François Venel and Pierre Bayen, 63–83, 1757.
- Callon, Michel. "Éléments Pour Une Sociologie De La Traduction, La Domestication Des Coquilles Saint-Jacques Et Des Marins-Pêcheurs Dans La Baie De Saint-Brieuc." *L'année sociologique* 36, no. 3 (1986): 169–208.

- Calmet, Dom. "Traité Historique Des Eaux Et Bains De Plombières, De Bourbonne, De Luxueil, Et De Bains." A Nancy, chez Leseure, Imprimeur ordinaire du Roi, 1768.
- Campbell, George. *Rhetoric in the Age of Enlightenment*. SIU Press, 2003.
- Campbell, Nancy D. "Reconstructing Science and Technology Studies: Views from Feminist Standpoint Theory." *Frontiers: A Journal of Women Studies* 30, no. 1 (2009): 1–29.
- Cantor, D. "The Contradictions of Specialization: Rheumatism and the Decline of the Spa in Inter-War Britain." *Medical history*, n°10, "The medical history of waters and spas" (1990): 127–44.
- Cantwell, Andrew. "Analyse Des Nouvelles Eaux De Passy." A Paris, Chez Delaguette, Libraire & Imprimeur, rue S. Jacques, à l'Olivier, 1755.
- Carey, Daniel, and Lymm Festa. *The Postcolonial Enlightenment: Eighteenth-Century Colonialism and Postcolonial Theory*. Oxford University Press, 2009.
- Carrère, Joseph-Barthélemy-François. "Catalogue Raisonné Des Ouvrages Qui Ont Été Publiés Sur Les Eaux Minérales En Général Et Sur Celles De La France En Particulier, Avec Une Notice De Toutes Les Eaux Minérales De Ce Royaume." A Paris, Chez Rémont, Libraire, quai des Augustins, n°41, 1785.
- Carrison, Carole. "Villes D'eaux, Villes De Loisirs. L'exemple Des Stations Thermales Françaises De La Fin Du Xixe Siècle Aux Années Trente." [In Fr]. *Histoire urbaine* 41, no. 3 (2014): 83–103.
- Caudron, Olivier. "Le Bureau De Distribution Des Eaux Minérales De La Rochelle (1773–1790)." *Ecrits d'Ouest* 19 (2011): 233–40.
- Cayleff, Susan. *Wash and Be Healed: The Water-Cure Movement and Women's Health*. Health, Society, and Policy. Temple University Press, 2010.
- Cayleff, Susan E. *Nature's Path : A History of Naturopathic Healing in America*. Johns Hopkins University, 2016.
- Chakrabarti, Pratik. "Medical Marketplaces Beyond the West: Bazaar Medicine, Trade and the English Establishment in Eighteenth-Century India." In *Medicine and the Market in England and Its Colonies, C. 1450–C. 1850*, edited by Mark J. S. Jenner and Patrick Wallis, 196–215. London: Palgrave Macmillan, 2007.
- Chambriard, Pascal. *Aux Sources De Vichy, Naissance Et Développement D'un Bassin Thermal (Xixe-Xxe Siècles)*. Bleu Autour, 2004.
- . "L'embouteillage Des Eaux Minérales : Quatre Siècles D'histoire." *Annales Des Mines* (1998): 20–29.
- Chang, Hasok. "The Hidden History of Phlogiston: How Philosophical Failure Can Generate Historiographical Refinement." *Hyle an International Journal for the Philosophy of Chemistry* 16, no. 2 (2010): 47–79.
- . *Is Water H2O? Evidence, Realism and Pluralism*. Boston Studies in the Philosophy and History of Science. Dordrecht: Springer, 2012.

- . “Water: The Long Road from Aristotelian Element to H<sub>2</sub>O.” *Circumscribere* 12 (2012): 1–15.
- . “We Have Never Been Whiggish (About Phlogiston).” *Centaurus* 51, no. 4 (2009): 239–64.
- Chaplin, Joyce E. “Why Drink Water? Diet, Materialisms, and British Imperialism.” *Osiris* 35 (2020): 99–122.
- Chappey, Jean Luc. *Des Naturalistes En Révolution. Les Procès-Verbaux De La Société D’histoire Naturelle De Paris (1790–1798)*. Cths Sciences, 2010.
- Charleton, Rice. “Three Tracts on Bath Water.” Bath: Printed by R. Cruttwell; for W. Taylor, in Church-Street, Kingdom Buildings, and sold by R. Baldwin, no 47, in Pater noster-Roz, London, 1774.
- Chartier, Roger. *Les Origines Culturelles De La Révolution Française*. Le Seuil, 1990.
- Chaussinand-Nogaret, Guy. “Nobles Médecins Et Médecins De Cour Au Xviii Siècle.” *Annales. Economies, sociétés, civilisations* 32, no. 5 (1977): 851–57.
- Chevallier, Alphonse. *Les Eaux De Chaudes-Aigues*. Paris: Res Universis, 1991.
- Chevallier, Pierre. *Henri iii : Roi Shakespearien*. Paris: Fayard, 1985.
- Cheyne, George. “An Essay of the True Nature and Due Method of Treating the Gout : Written for the Use of Richard Tennison, Esq. : Together with an Account of the Nature and Quality of Bath-Waters, the Manner of Using Them, and the Diseases to Which They Are Proper : As Also, of the Nature and Cure of Most Chronical Distempers : Not Publish'd Before.” London : printed for G. Strahan, at the Golden Ball, over against the Royal Exchange in Cornhill, and sold by W. Mears, without Temple-Bar, and J. Leak, at the Bath, 1724.
- Christie, John R. R. . “Chemistry through the 'Two Revolutions': Chemical Glasgow and Its Chemical Entrepreneurs, 1760–1860.” In *Compound Histories: Materials, Governance and Production, 1760–1840*, edited by Lissa Roberts and Simon Werrett, 311–32: Brill, 2018.
- Cobban, Alfred. “The ‘Parlements’ of France in the Eighteenth Century.” *History* 35, no. 123/124 (1950): 64–80.
- Colbert, Jean Baptiste. “Lettres, Instructions Et Mémoires De Colbert, 5, Fortifications, Sciences, Lettres, Beaux-Arts, Bâtiments, Publ. D’après Les Ordres De L’empereur.” par Pierre Clément, impr. impériale, 1861–1873.
- Cole, W. A. “Trends in Eighteenth-Century Smuggling.” *The Economic History Review* 10, no. 3 (1958): 395–410.
- Coley, Noel G. “Physicians and the Chemical Analysis of Mineral Waters in Eighteenth-Century England.” *Medical history* 26 (1982): 123–44.
- Collins, Harry, and Trevor J Pinch. *The Golem at Large, What You Should Know About Technology*. Cambridge: Cambridge University Press, 2014.

- comptes, Cour des. *Les Interventions Publiques Dans Le Domaine Du Thermalisme: Rapport Au Président De La République Suivi Des Réponses Des Administrations Collectivités Et Organismes*. Cour des Comptes (Paris: 1995).
- Conchon, Anne. *La Corvée Des Grands Chemins Au Xviii Siècle*. Presses Universitaires de Rennes, 2016.
- . *Le Péage En France Au Xviii Siècle: Les Privilèges À L'épreuve De La Réforme*. Vincennes: Institut de la gestion publique et du développement économique, Comité pour l'histoire économique et financière de la France, 2013.
- Condette-Marcant, Anne-Sophie. *Bâtir Une Généralité, Le Droit Des Travaux Publics Dans La Généralité D'amiens Au Xviii Siècle*. IGPDE, 2001.
- Conforti, Maria. "Subterranean Fires and Chemical Exhalations: Mineral Waters in the Phlegraean Fiels in the Early Modern Age." In *Le Thermalisme: Approches Historiques Et Archéologiques D'Un Phénomène Culturel Et Médical*, edited by John Scheid, Marilyn Nicoud, Didier Boisseuil and Joël Coste, 123–36: CRNS Éditions, 2015.
- Coquillard, Isabelle. "L'émergence D'un Groupe Professionnel : Les Docteurs Régents De La Faculté De Médecine De Paris Au Xviii Siècle." In *Histoires De Nobles Et De Bourgeois: Individus, Groupes, Réseaux En France. Xvie–Xviii*, edited by Jean Duma, 161–87. Nanterre: Presses universitaires de Paris Nanterre, 2011.
- . "Les Docteurs Régents De La Faculté De Médecine De Paris Et La Fourniture De Soins Aux « bons Pauvres Malades » Dans Les Paroisses Parisiennes (1644–1791)." *Revue Historique des Armées* 668, no. 4 (2013): 875–904.
- Corbin, Alain. *The Foul and the Fragrant: Odor and the French Social Imagination*. Harvard University Press, 1986.
- Corvisier, André. *L'armée Française De La Fin Du Xvii Siècle Au Ministère De Choiseul*. Le Soldat. Vol. 2, Paris: P.U.F., 1964.
- Cosma-Muller, Pascale. "Entre Science Et Commerce: Les Eaux Minérales En France À La Fin De L'ancien Régime." *Historical Reflections / Réflexions Historiques* 9, no. 1/2 (1982): 249–62.
- Cossic, Annick. *Bath Au Xviii Siècle : Les Fastes D'une Cité Palladienne*. Presses universitaires de Rennes, 2000.
- . "Spa Sociability and the Reformation of the Nation: The Case of Hannah More in Georgian Bath (1792–1802)." *Thermalisme et Politique (XVIIe–XIXe siècle)*, 2021.
- Cossic, Annick, and Hélène Dachez, eds. *La Sociabilité En France Et En Grande Bretagne Au Siècle Des Lumières: Le Manuscrit*, 2013.
- Cossic, Annick, and Patrick Galliou, eds. *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*. Newcastle: Cambridge Scholar Press, 2006.

- Coste, Joël. “Médecine Et Thermalisme À L’époque Moderne : Suivismes Des Pratiques Et Plasticité Doctrinale Dans Les Recueils De Consilia Et Consultations Français (Milieu Xvie siècle-Début Xixe siècle).” *CNRS Éditions* (2015): 233–52.
- Coulomb, Clarisse. “Femmes, Pouvoirs Et Contrebandes Dans Les Alpes Au XVIIIe Siècle.” *Histoire urbaine* 52, no. 2 (2018): 167–70.
- Cozzens, S., and T. Gieryn, eds. *Theories of Science in Society*. Bloomington: Indiana University Press, 1990.
- Crosland, Maurice. “The Officers De Santé of the French Revolution: A Case Study in the Changing Language of Medicine.” *Med Hist.* 48, no. 2 (2004): 229–44.
- Darnton, Robert. *Censors at Work, How States Shaped Literature*. New York, London: W. W. Norton, 2014.
- . *The Forbidden Best-Sellers of Pre-Revolutionary France*. New York: Norton, 1996.
- Daston, Lorraine. “Dreams of a Rule without Exceptions: A Chapter from the History of Rules.” Seminar of the Swedish Collegium for Advanced Study, 2019.
- . “Science Studies and the History of Science.” *Critical Inquiry* 35, no. 4 (2009): 798–813.
- Dear, Peter, and Jasanoff Sheila. “Dismantling Boundaries in Science and Technology Studies.” *Isis* 101, no. 4 (2010): 759–74.
- Débarbat, Suzanne, and Antonio E Ten, eds. *Mètre Et Système Métrique*. Paris, Valencia: Universitat de València, 1993.
- Debrest, Jean Baptiste. “Traité Des Eaux Minérales De Chateldon, De Celles De Vichy Et Haute-Rive En Bourbonnois, Avec Le Détail De Leurs Propriétés Médicinales & Leur Analyse.” Chez la veuve Faure et chez Didot, à Moulins & à Paris, 1778.
- Debus, Allen G. “Sir Thomas Browne and the Study of Colour Indicators.” *Ambix* 10, no. 1 (1962): 29–36.
- Dechambre, Amédée. “Dictionnaire Encyclopédique Des Sciences Médicales.” Paris : G. Masson : P. Asselin, 1877, 1877.
- “Déclaration Du Roi, Portant Établissement D’une Commission Royale De Médecine Pour L’examen Des Remèdes Particuliers Et La Distribution Des Eaux Minérales, Registrée En Parlement Le 28 Août Audit An.” A Paris, de l’Imprimerie Royale, 1772.
- Dictionnaire universel françois et latin contenant la signification et la définition tant des mots de l’une et l’autre langue, avec leurs différents usages, que des termes propres de chaque état et de chaque profession*. Imprimé à Trevoux et se vend à Paris, 1721.
- Delaunay, Paul. *La Vie Médicale Aux Xvie, Xvii Et Xviii Siècles*. Slatkine, 2001.

- Desaive, Jean Paul, Jean-Pierre Goubert, Emmanuel Le Roy Ladurie, Jean Meyer, Otto Muller, and Jean-Pierre Peter. *Médecins, Climat Et Épidémies a La Fin Du Xviii Siècle*. Civilisations Et Sociétés. Vol. 29: Éditions EHESS, 1978.
- Descola, Philippe. *Par-Delà Nature Et Culture*. Paris: Gallimard, 2005.
- Deyeux, Nicolas. "Analyse Des Nouvelles Eaux Minérales De Passy, Communiquée À L'école De Médecine De Paris." Extrait de la collection des mémoires de cette école, dont le premier volume paraîtra incessamment, à Paris, chez Méquignon l'aîné, 1808.
- Dhombres, Jean. "Résistances Et Adaptation Du Monde Paysan Au Système Métrique Issu De La Révolution : Les Indices D'évolution D'une Culture De La Quantification." *Annales de Bretagne et des pays de l'Ouest* 100, no. 4 (1993): 427–39.
- "Dictionnaire des sciences médicales, par une Société de médecins et de chirurgiens," (à Paris, chez Charles-Louis-Fleury Panckoucke, 1814).
- "Dictionnaire universel françois et latin contenant la signification et la définition tant des mots de l'une et l'autre langue, avec leurs différents usages, que des termes propres de chaque état et de chaque profession, communément appelé Dictionnaire de Trévoux,." Nancy, de l'imprimerie de Pierre Antoine, 1740.
- Diderot, Denis, D'Alembert Jean le Rond, and Louis de Jaucourt. "Encyclopédie, Ou Dictionnaire Raisoné Des Sciences, Des Arts Et Des Métiers." edited by Alexandre Guilbaud, Marie Leca-Tsiomis, Irène Passeron and Alain Cernuschi, Édition Numérique Collaborative et CRitique de l'Encyclopédie (ENCCRE), 2017.
- Donovan, Arthur. "Pneumatic Chemistry and Newtonian Natural Philosophy in the Eighteenth Century: William Cullen and Joseph Black." *Isis* 67, no. 2 (1976): 217–28.
- Drevillon, Hervé. *Lire Et Écrire L'avenir . L'astrologie Dans La France Du Grand Siècle*. Seyssel: Champ vallon, 1996.
- Dubé, Jean-Paul. "L'intérêt D'un Médecin De Province Du Xviiè Siècle Pour Les Eaux Minérales Et Les Monstres." *Canadian Bulletin of Medical History* 15, no. 2 (1998): 337–49.
- Dubuc, André. "Législation Des Foires Et Marchés En Normandie Sous L'ancien Régime." *Annales de Normandie* 26, no. 4 (1976): 320–21.
- Duclos, Samuel C. "Observations Sur Les Eaux Minérales De Plusieurs Provinces De France, Faites En L'académie Royale Des Sciences En L'année 1670 Et 1671." Paris, de l'imprimerie Royale, 1675.
- Dulaure, J. A. "Nouvelle Description Des Environs De Paris: Contenant Les Détails Historiques Et Descriptifs De Maisons Royales Des Villes, Bourgs." Chez Lejay, Libraire, rue NEuve des Petits Champs, près celle de Richelieum au Grand Corneille, 1787.
- Dumarche, Lionel. "La Caserne En France Au Xviiiè Siècle : Genèse D'un Instrument Du Pouvoir." *Revue Historique des Armées*, no. 1 (1984): 53–62.

- Eddy, Matthew. "The Sparkling Nectar of Spas; or, Mineral Water as a Medically Commodifiable Material in the Province, 1770–1805." In *Materials and Expertise in Early Modern Europe, between Market and Laboratory*, edited by Ursula Klein and C. Emma Spary, 283–92: University of Chicago Press, 2010.
- Euzen, Agathe, and J-P Haghe. "Drinking Water from the Seine in the 18th Century, or the Emergence of the Filtration Fountain." 5th IWHA conference, Pasts and Futures of Water, Tampere, Finland, 2006.
- Farge, Arlette. *Dire Et Mal Dire, L'opinion Publique Au Xviii Siècle*. Paris: Seuil, 1992.
- . *Vivre Dans La Rue À Paris Au Xviii Siècle*. Paris: Gallimard, 1992.
- Farge, Arlette, and Michel Foucault. *Le Désordre Des Familles*. Gallimard, 2014. 1982.
- Farkas, Carol-Ann. "'Tons of Useful Stuff': Defining Wellness in Popular Magazines." *Studies in Popular Culture* 33, no. 1 (2010): 113–32.
- Faure, Olivier. "Aux Marges De La Médecine. Santé Et Souci De Soi. France Xixe Siècle." *Revue d'histoire du XIXe siècle* 52, no. 1 (2016): 215–16.
- . "Les Petites Stations Thermales En France Au Xixe Siècle : Un Autre Thermalisme ?". In *2000 Ans De Thermalisme : Économie, Patrimoine, Rites Et Pratiques*, edited by Dominique Jarrassé, 33–47. Clermont Ferrand: Presses Universitaires Blaise-Pascal, 1999.
- . "Un Thermalisme Populaire Dans La Première Moitié Du Xixe Siècle." *Thermalisme et Politique (XVIIe-XIXe siècle)*, 2021.
- Febvre, Lucien. "Albert Mathiez : Un Tempérament, Une Éducation." *Annales* 18 (1932): 573–76.
- Felt, Ulrike, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, eds. *The Handbook of Science and Technology Studies, Fourth Edition*. Cambridge, London: MIT Press, 2016.
- Férol, Marie-Eve. "Luxure, Calme Et Volupté Dans Les Villes D'eaux Françaises À L'âge D'or Du Thermalisme (Belle Époque Et Années Folles)." *Via Tourism Review* 11–12 (2017).
- Fleck, Ludwik. *Genèse Et Développement D'un Fait Scientifique*. Translated by Nathalie Jas. Paris: Champs Sciences, 2008. 1935.
- Fors, Hjalmar. *The Limits of Matter: Chemistry, Mining, and Enlightenment*. Chicago: University of Chicago Press, 2015.
- Foucault, Michel. *Histoire De La Folie À L'âge Classique*. Saint Amand: Gallimard, 1995. 1972.
- . *Naissance De La Clinique*. [The Birth of the Clinic]. London: Tavistock Publications, 1973. Presses Universitaires de France.
- Fourcat, Jean Pierre. "Le Développement International Du Secteur Des Eaux Minérales Embouteillées." *Les Annales des Mines* (1998): 68–74.
- Fourcroy, Antoine François de. "Rapport Et Projet De Décret De Fourcroy, Au Nom Des Comités De Salut Public Et D'instruction Publique, Pour Établir À Paris Une École Centrale De Santé, Lors De La Séance Du

- 7 Frimaire an Iii (27 Novembre 1794).” Première série (1787–1799), 262–66CNRS éditions, Archives Parlementaires de 1787 à 1860, 2012.
- Fourcroy, Antoine François de, and Jean-Jacques de Delaporte. “Analyse Chimique De L'eau Sulfureuse D'enghien, Pour Servir a L'histoire Des Eaux Sulfureuses En Général.” A Paris, Chez Cuchet, Libraire, rue & hôtel Serpente, 1788.
- . “Traité Complet Des Eaux Minérales De La France.” A Paris, chez Gay & Gide, Libraires, rue Honoré n°85, vis-à-vis la Maison d'Aligre, & rue d'Enger, n° 731, 1792.
- Fournier, Josette. “Chimie Et Chimistes Dans Le Journal De Médecine, Chirurgie, Pharmacie, & C, De 1754 À 1791.” *Revue d'histoire de la pharmacie* 94, n°350 (2006): 205–20.
- Fournier, Patrick. “Entre Technique Et Politique : Les Adductions D'eau Dans Les Capitales Provinciales En France Du Xvie Au Xviii siècle.” *Histoire, économie & société* 35, no. 3 (2016): 76–96.
- Franckowiak, Rémi. “La Chimie Du Xviiie siècle : Une Question De Principes.” *Methodos* 8 (2008).
- Frängsmyr, Tore, J. L. Heilbron, and Robin E. Rider, eds. *The Quantifying Spirit in the Eighteenth Century*. Berkeley, Los Angeles, Oxford: University of California Press, 1990.
- Freedman, Paul, ed. *Food: The History of Taste*, California Studies in Food and Culture: University of California Press, 2007.
- Froelhy, Françoise. *Quand La Pauvreté Était Un Crime, Les Gueux Dans Le Sud-Ouest Au Siècle Des Lumières (1763–1789)*. Cairn Édition, 2018.
- Fürberth, Frank. “L'essor De La Balnéologie Dans Le Monde Germanique À La Fin Du Moyen Âge.” In *Séjourner Au Bain: Le Thermalisme Entre Médecine Et Société (Xvie–Xviiie Siècle)*, edited by Didier Boisseuil and Marilyn Nicoud, 99–111. Lyon: Presses Universitaires de Lyon, 2010.
- Galliou, Patrick. “Water, Water Everywhere... Water, Ailing Bodies and the Gods in Roman Gaul and Britain.” In *Spas in Britain and in France in the Eighteenth and Nineteenth Centuries*, edited by Annick Cossic and Patrick Galliou, 3–12. Newcastle: Cambridge Scholar Press, 2006.
- Gargane, J.J. “Gazette De Santé.” Chez Ruault, Libraire, rue de la Harpe, 1773–1774.
- Garrioch, David. *La Fabrique Du Paris Révolutionnaire*. Paris: La Découverte, 2013.
- Gast, René. *Le Canal Du Midi Et Les Voies Navigables De L'atlantique À La Méditerranée*. Rennes: Éditions Ouest-France, 2000.
- Gentilcore, David. “From ‘Vilest Beverage’ to ‘Universal Medicine’: Drinking Water in Printed Regimens and Health Guides, 1450–1750.” *Social History of Medicine* 33: 683–703.

- Genty, Maurice. "Les Dernières Années De La Société Royale De Médecine : 1789–1793." *Le progrès médical* 14, no. 7 (1937): 49–53.
- Ginzburg, Carlo. *The Cheese and the Worms, the Cosmos of a Sixteenth-Century Miller*. [Il formaggio e i vermi: Il cosmo di un mugnaio del'500]. Translated by Anne C. Tedeschi and John Tedeschi. Baltimore: The Johns Hopkins University Press, 2013. 1976.
- Godelier, Maurice. *Rationalité Et Irrationalité En Économie*. Paris: Maspéro, 1966.
- Goodman, Dena. *The Republic of Letters, a Cultural History of the French Enlightenment*. Ithaca: Cornell University Press, 1994.
- Goodney, David E. "Acid–Base Chemistry According to Robert Boyle: Chemical Reactions in Words as Well as Symbols." *Journal of Chemical Education* 83, no. 7 (2006).
- Goubert, Jean-Pierre. "The Extent of Medical Practice in France around 1780." *Journal of Social History* 10, no. 4 (1977): 410–27.
- . "L'eau Et L'expertise Sanitaire Dans La France Du Xixe Siècle : Le Rôle De L'académie De Médecine Et Des Congrès Internationaux D'hygiène." *Sciences sociales et santé* 3, no. 2 (1985): 75–102.
- Goubert, Jean-Pierre, and F. Lebrun. "Medecins Et Chirugiens Dans La Société Française Du Xviie Siècle." *Annales Cisalpines d'Histoire sociale*, no. 4 (1973).
- Grégoire, Henri. "Rapport Et Projet De Décret, Présenté Au Nom Du Comité D'instruction Publique, À La Séance Du 8 Août." Paris, Imprimé par ordre de la Convention Nationale, 1793.
- Grell, Chantal. "Astrologie Et Politique Au Milieu Du Xviie Siècle, : Les "Nativités" Et "Révolutions" De Bouilliau Et De Des Noyers." *Dix-septième siècle* 266, no. 1 (2015): 43–53.
- Grenet, Micheline. *La Passion Des Astres Au Xviie Siècle. De L'astrologie À L'astronomie*. Paris: Hachette, 1994.
- Grevet, René. "La Réforme Des Études En France Au Siècle Des Lumières." *Revue Historique des Armées* 601, no. 1 (1997): 85–123.
- Groenewegen, Peter. *Eighteenth-Century Economics: Turgot, Beccaria and Smith and Their Contemporaries*. Routledge, 2002.
- Hafter, Daryl M. "Female Masters in the Ribbonmaking Guild of Eighteenth-Century Rouen." *French Historical Studies* 20, no. 1 (1997): 1–14.
- . "Women in the Underground Business of Eighteenth-Century Lyon." *Enterprise & Society* 2, no. 1 (2001): 11–40.
- Hagimont, Steve. "Plaisirs Mondains Et Affections Populaires. Le Sort Des Malades Indigents Dans Les Stations Thermales Au Xixe Siècle." *Revue de Comminges et des Pyrénées centrales, Société des Études du Comminges* 133 (2017): 287–309.
- . "Un Essor Touristique Et Thermal Contrarié Au Xixe Siècle : Ax-Les-Thermes." *Archives ariégeoises* 10 (2018): 86–109.

- Hamlin, Christopher. *A Science of Impurity, Water Analysis in Nineteenth Century Britain*. Berkeley, Los Angeles, Oxford: University of California Press, 1990.
- Hanegraaff, Wouter J. "The Notion of "Occult Sciences" in the Wake of the Enlightenment." *Aufklärung Und Esoterik: Wege in Die Moderne* (2013): 73–95.
- Harley, David. "A Sword in a Madman's Hand : Professional Opposition to Popular Consumption in the Waters Literature of Southern England and the Midlands, 1570–1870." *Medical History*, 10 (1990): 48–55.
- Hendriksen, Marieke M. A. "Boerhaave's Mineral Chemistry and Its Influence on Eighteenth-Century Pharmacy in the Netherlands and England." *Ambix* 65, no. 4 (2018): 303–23.
- . "Criticizing Chrysopoeia? Alchemy, Chemistry, Academics, and Satire in the Northern Netherlands, 1650–1750." *Isis* 109, no. 2 (2018): 235–53.
- Henriet, Lucie. *De La Quête De Santé Par L'eau À La Médecine Des Eaux : Cohabitation Entre Médecins Et Villageois Dans Les Établissements De Bains De Basse-Auvergne (1772–1840)*. Upcoming.
- Heywood, Audrey. "A Trial of the Bath Waters : The Treatment of Lead Poisoning." *Medical History*, n°10 (1990): 82–101.
- Hildesheimer, Françoise. "Centralisation, Pouvoir Local Et Diplomatie: Les Ordonnances Des Intendants." *Bibliothèque de l'École Des Chartes* 136, no. 1 (1978): 37–68.
- "Histoire De La Société Royale De Médecine, Avec Les Mémoires De Médecine Et De Physique Médicale, Tirés Des Registres De Cette Société." Paris : de l'imprimerie de Philippe-Denys Pierre, et se trouve chez Didot jeune, 1779.
- Hoffmann, Friedrich. "Nouvelles Expériences Et Observations Sur Les Eaux Minérales De L'Allemagne ... Traduites Du Célèbre Frédéric Hoffmann." Berlin, chez Aude et Spener, 1752.
- Holmes, Frederic L. "Analysis by Fire and Solvent Extractions: The Metamorphosis of a Tradition." *Isis* 62, no. 2 (1971): 129–48.
- Holmes, Frederic L., and Trevor H. Levere, eds. *Instruments and Experimentation in the History of Chemistry*. Cambridge: MIT Press, 2000.
- Howes, David. *Sensual Relations, Engaging the Senses in Culture & Social Theory*. The University of Michigan Press, 2004.
- Howes, David, and Marc Lalonde. "The History of Sensibilities: Of the Standard of Taste in Mid-Eighteenth Century England and the Circulation of Smells in Post-Revolutionary France." *Dialectical Anthropology* 16, no. 2 (1991): 125–35.
- Hufton, Olwen. "Women without Men: Widows and Spinsters in Britain and France in the Eighteenth Century." *Journal of Family History* 9, no. 4 (1984): 355–76.

- Jarrassé, Dominique, ed. *Deux Mille Ans De Thermalisme : Économie, Patrimoine, Rites Et Pratiques* Vol. 1. Aurillac: Presses Universitaires de Clermont Ferrand, 1996.
- . *Les Thermes Romantiques: Bains Et Villégiatures En France De 1800 À 1850*. Clermont Ferrand: Presses Universitaires Blaise-Pascal, 1999.
- Jazé-Charvolin, Marie-Reine. “Les Stations Thermales : De L’abandon À La Renaissance. Une Brève Histoire Du Thermalisme En France Depuis L’antiquité.” *In Situ* 24 (2014).
- Jedrzejewski, Franck. *Histoire Universelle De La Mesure*. Paris: Ellipses, 2002.
- Johnson, Rachael. “Bell Causey at Tunbridge Wells: Master of Ceremonies, Matchmaker, or Pimp?” *Thermalisme et Politique (XVIIe-XIXe siècle)*, 2021.
- Jones, Vivien, ed. *Women in the Eighteenth Century, Constructions of Femininity*. London: Routledge, 1990.
- Jou, Folch G., and Santamaria M. Aenaiz. *Los Analisis De Aguas En La Espana De La Ilustracion. Brève Estudio Analitico-Historico-Critico De La Bibliografia Espanola*. Madrid: Universidad Complutense, Facultad de Farmacia, 1983.
- Jouanna, Arlette. *Le Pouvoir Absolu, Naissance De L'imaginaire Politique De La Royauté*. Paris: Gallimard, 2013.
- “Journal De Paris.” De l’Imprimerie du Journal de Paris, même Maison, 1791.
- Kambaskovic-Sawers, Danijela, and Charles Wolfe. “The Senses in Philosophy and Science: From the Nobility of Sight to the Materialism of Touch, a Cultural History of the Senses in the Renaissance.” In *A Cultural History of the Senses in the Renaissance*, edited by Herman Roodenburg, 107–222: Bloomsbury, 2014.
- Kant, Immanuel. *Anthropology from a Pragmatic Point of View*. Edited by Robert B. Loudon and Manfred Kuehn. Cambridge University Press, 2006.
- Karayannis, MI, and CE Efstathiou. “Significant Steps in the Evolution of Analytical Chemistry.” *Talanta* 102, no. 7 (2012): 7–15.
- Kessler, Amalia D. *A Revolution in Commerce, the Parisian Merchant Court and the Rise of Commercial Society in Eighteenth-Century France*. New Haven, London: Yale University Press, 2007.
- Kim, Mi Gyung. *Affinity, That Elusive Dream: A Genealogy of the Chemical Revolution*. Boston: MIT Press, 2003.
- Kirker, Milton. “Herman Boerhaave and the Development of Pneumatic Chemistry.” *Isis* 46, no. 1 (1955): 36–49.
- Komatina, Miomir M. “Medical Geology: Effects of Geological Environments on Human Health.” In *Developments in Earth and Environmental Sciences*, edited by Miomir M. Komatina, 38–235, 2004.

- Kuhn, Thomas. *The Structure of Scientific Revolutions*. University of Chicago Press, 1962.
- Kula, Witold. *Les Mesures Et Les Hommes*. Translated by Joanna Ritt. Paris: Éditions de la Maison des sciences de l'homme, 1984.
- Labrude, Pierre. “Les Premiers Chimistes Lorrains. La Chimie En Lorraine Du Xvii<sup>e</sup> Au Xix<sup>e</sup> Siècles.” *Revue d'histoire de la pharmacie* 96, n°361 (2009): 23–36.
- Laffont, Jean-Luc. “La Police De Voisinage À La Base De L’organisation Policière Des Villes De L’Ancienne France.” *Annales de la recherche urbaine* (1999): 23–30.
- Lafont, Olivier. “L’introduction Du Quinquina Dans La Médecine Européenne : Un Choc Culturel Au Xvii<sup>e</sup> Siècle.” In *Materia Medica, Savoirs Et Usages Des Médicaments Aux Époques Médiévales Et Modernes*, edited by Philip Rieder and François Zanetti, 119–30. Genève: Libraire Droz, 2018.
- Lanoix, Jean Baptiste. “Analyse Des Eaux Minérales D’orliénas.” A Lyon, De l’Imprimerie d’Aimé de la Roche, aux Halles de la Grenette, 1780.
- Lanza, Janine. “Women Minding the Store in Eighteenth-Century France.” *Early Modern Women: An Interdisciplinary Journal* 10, no. 1 (2015): 131–40.
- Latour, Bruno. *Nous N’Avons Jamais Été Modernes, Essai D’anthropologie Symétrique*. Paris: La Découverte, 1997. 1991.
- . *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press, 2005.
- . *Science in Action: How to Follow Scientists and Engineers through Society*. Harvard University Press, 1987.
- Lavoisier, Antoine Laurent de. “Traité Élémentaire De Chimie, Présenté Dans Un Ordre Nouveau Et D’après Les Découvertes Modernes Par M. Lavoisier.” A Paris : chez Cuchet, 1789.
- Lawrence, Susan C. “Educating the Senses: Students, Teachers and Medical Rhetoric in Eighteenth-Century London.” In *Medicine and the Five Senses*, edited by William F. Bynum and Roy Porter, 154–78: Cambridge University Press, 1993.
- Le Cat, Claude Nicolas. “Traité Des Sens.” A Paris, chez Guillaume Cavalier, 1744.
- Le Grand, Homer E. “Chemistry in a Provincial Context: The Montpellier Société Royale Des Sciences in the Eighteenth Century.” *Ambix* 29, no. 2 (1984): 88–105.
- Le Nabour, Éric. *La Reynie. Le Policier De Louis Xiv*. Paris: Perrin, 1993.
- Le Veillard. “Mémoire À Consulter Pour Les Sieur & Dame Le Veillard, Propriétaires Des Nouvelles Eaux Minérales De Passy. Contre Le Sieur Croharé, Apothicaire De Monseigneur Le Comte D’artois.” Impr. de Monsieur, 1786.
- Lefebvre, Thierry, and Cécile Raynal. *Du Thermalisme À La Médecine Thermale. aux Sources Du Vrai « Made in France »*. Le Square, 2015.

- . “Effervescence Pharmaceutique Autour De L'eau De Seltz.” *Revue d'histoire de la pharmacie* 94, n°352 (2006): 511–23.
- . *La Source Miraton À Châtel-Guyon*. Nîmes: Lacour-Ollé, 2017.
- . “Les Lieux D’activité Du Chimiste Pierre-Joseph Macquer (1718–1784) : Laboratoire Et Instruments.” Séminaire de la Société de Chimie, Paris, 2017.
- . “Les Multiples Facettes Des Cours De Chimie En France Au Milieu Du Xviiiè Siècle.” *Histoire de l'éducation* 130 (2011): 31–56.
- . “Mid-Eighteenth-Century Chemistry in France as Seen through Student Notes from the Courses of Gabriel-François Venel and Guillaume-François Rouelle.” *Ambix* 56, no. 2 (2009): 163–89.
- Lemaire, J. “Essai Analitique Sur Les Eaux De Bussang.” A Remiremont, chez C. Nicolas-Emmanuel Laurent, Imprimeur Ordinaire de la Ville & Marchand Libraire, 1750.
- Lémery, Nicolas. “Traité Universel Des Drogues Simples, Mises En Ordre Alphabetique: Où L'on Trouve Leurs Differens Noms, Leur Origne, Leur Choix, Les Principes Qu'elles Renferment, Leurs Qualitez, Leur Étimologie, & Tout Ce Qu'il Y a De Particulier Dans Les Animaux, Dans Les Vegetaux & Dans Les Mineraux. Ouvrage Dépendant De La Pharmacope'e Universelle.” A Paris chez Laurent d’Hourt, 1714.
- Letaconnoux, J. “Les Transports En France Au Xviiiè Siècle.” *Revue d'histoire moderne et contemporaine* 11, no. 2 (1908): 97–114.
- “Lettres Patentes Du Roi, Portant Etablissement D'une Société Royale De Médecine: Données À Versailles Au Mois D'août 1778.” de l'imprimerie de P. G. Simon, 1778.
- “Lettres Patentes Du Roi, Portant Règlement Pour La Société Royale De Médecine, Donnée À Versailles Le 1er Février 1780, Registrées En Parlement Le 25 Avril Audit An.” A Paris de l'imprimerie Royale, 1780.
- “Lettres Patentes Du Roy, Qui Unissent La Sur-Intendace Des Eaux Minerales [Et] Medicinales Du Royaume, À La Charge De Premier Medecin Du Roy: Donées À Versaille Le 19. Aoust 1709.” Francia. Rey, chez la Veuve François Muguet et Hubert Muguet, 1709.
- Levacher de La Feutrie, Achille-François-Thomas. “Lassone Ou La Séance De La Société Royale De Médecine, Comédie En Trois Actes Et En Vers.” Paris, 1779.
- Lilti, Antoine. “In the Shadow of the Public: Enlightenment and the Pitfalls of Modernity.” *International Journal for History, Culture and Modernity* 8, no. 3–4 (2020): 256–77.
- . *L'héritage Des Lumières, Ambivalences De La Modernité*. Paris: EHESS-Gallimard-Seuil, 2019.
- Lorcin, Marie-Thérèse. “Humeurs, Bains Et Tisanes : L'eau Dans La Médecine Médiévale, L'eau Au Moyen Âge.” *Senefiance* 15 (1985): 259–73.

- . “Un Musée Imaginaire De La Ruse Paysanne La Fraude Des Décimables Du Xive Au Xviii Siècle Dans La Région Lyonnaise.” *Études Rurales* 51 (1973): 112–24.
- Lotz-Heumann, Ute. *The German Spa in the Long Eighteenth Century, a Cultural History*. Routledge, 2021.
- Louis, Antoine, and Frédéric Amiens, Dubois, d’. “Eloges Lui Dans Les Séances Publiques De L’académie Royale De Chirurgie De 1750 À 1792.” Londres, New-York, J-B Baillièrre et Fils, Libraires de l’Académie impériale de Médecine, rue Hautefeuille, 19, 1859.
- Lucas, Charles. “An Essay on Waters: In Three Parts. Treating, I. Of Simple Waters. Ii. Of Cold, Medicated Waters. Iii. Of Natural Baths.” London, printed for A. Millar, 1756.
- Lundgren, Anders. “Kemi, Pedagogik Och Lite Estetik: Om Sinneskunskap I Naturvetenskaplig Undervisning Och Forskning Runt Sekelskiftet 1900.” In *Löftet Om Lyckan: Estetik, Musik Och Bildning*, edited by Anders Burman, Rebecca Lettevall and Sven-Eric Liedman, 149–68. Göteborg: Bokförlaget Daidalos, 2013.
- . “The New Chemistry in Sweden: The Debate That Wasn’t.” *Osiris* 4 (1988): 146–68.
- Lundgren, Anders, and Bernadette Bensaude-Vincent, eds. *Communicating Chemistry, Textbooks and Their Audiences 1789–1939*. USA: Science History Publications, 2000.
- Lunel, Alexandre. *La Maison Médicale Du Roi : Xvie–Xviii Siècles, Le Pouvoir Royal Et Les Professions De Santé (Médecins, Chirurgiens, Apothicaires)*. Champ Vallon Editions, 2008.
- . “Les Premiers Médecins Du Roi, Le Développement Des Stations Thermales Et La Réglementation Des Eaux Minérales En France (Xvie-Xviii siècles).” In *Le Thermalisme: Approches Historiques Et Archéologiques D’un Phénomène Culturel Et Médical*, edited by John Scheid, et al., 215–31. Paris: CNRS Éditions, 2015.
- . “Pierre Chirac, Premier Médecin Du Roi Et Le Projet Inachevé D’une Suintendance Médicale Sur L’art De Guérir.” *Bull. Acad. Natle Méd.* 189, no. 3 (2005): 547–52.
- Lynch, Michael. “Social Constructivism in Science and Technology Studies.” *Human Studies* 39, no. 1 (2016): 101–12.
- Mallat, Antonin. “Histoire Des Eaux Minérales De Vichy.” paris: Masson et Cie, 1906–1922.
- Maller, Cecily Jane. “Understanding Health through Social Practices: Performance and Materiality in Everyday Life.” *Sociology of Health & Illness* 37, no. 1 (2015): 52–66.
- Mallet, Audrey. *Vichy Contre Vichy, Une Capitale Sans Mémoire*. Belin, 2019.
- Mandelkern, India. “Taste-Based Medicine.” *Gastronomica* 15, no. 1 (2015): 8–21.

- Mandressi, Rafael. "Félix Vicq D'azyr: L'anatomie, L'état, La Médecine." *Bibliothèque Interuniversitaire de Médecine* (2005).
- Mansén, Elisabeth. *Ett Paradis På Jorden: Om Den Svenska Kurortskulturen 1680–1880*. Stockholm: Atlantis, 2001.
- Marion, Thomas. "Entre Médecine Et Politique : Félix Vicq D'azyr Et La Lutte Contre La Peste Bovine Sous L'ancien Régime." *Bulletin d'histoire et d'épistémologie des sciences de la vie* 19, no. 1 (2012): 97–126.
- Marty, Nicolas. "La Consommation Des Eaux Embouteillées. Entre Alimentation, Distinction Et Hygiène." *Vingtième Siècle* 91, no. 3 (2006): 25–41.
- McCusker, John J. "Les Équivalents Métriques Des Poids Et Mesures Du Commerce Colonial Aux Xvii Et Xviii Siècles." *Revue française d'histoire d'outre-mer* 61, n°224, no. 3 (1974): 349–65.
- McEvoy, John G. *The Historiography of the Chemical Revolution*. London, New York: Routledge, 2016.
- . "Joseph Priestley, "Aerial Philosopher": Metaphysics and Methodology in Priestley's Chemical Thought, from 1762 to 1781." *Ambix* 25, no. 1 (1978): 1–55.
- Mcintyre, Sylvia. "The Mineral Water Trade in the Eighteenth Century." *The Journal of Transport History* 2, no. 1 (1973): 1–19.
- Medema, Steven G., and Samuels J. Warren, eds. *A History of Economic Thought, the Lse Lectures*: Princeton University Press, 1998.
- Méglin, M. J. A. "Analyse Des Eaux Minérales De Sultzmat En Haute Alsace." de l'imprimerie Jean Henri Heitz, Impri. de l'Univ., 1779.
- Merley, Jean. *Histoire Des Eaux Minérales De Saint-Galmier*. Le Puy en Velay: Presses de l'imprimerie commerciale de "L'Eveil de la Haute Loire", 1994.
- Merton, Robert K. *The Sociology of Science: Theoretical and Empirical Investigations*. Chicago: University of Chicago Press, 1973.
- Meyer, Jean. "Une Enquête De L'académie De Médecine Sur Les Épidémies (1774–1794)." *Annales. Histoire, Sciences Sociales* 21, no. 4 (1966): 729–49.
- Miller, Ian. *Water: A Global History*. Reaktion Books, 2015.
- Milliot, Vincent. "L'admirable Police", *Tenir Paris Au Siècle Des Lumières*. Paris: La Découverte, 2013.
- Milot, Jean. "Les Garnisons Dans Les Petites Villes Du Nord À La Fin De L'ancien Régime." *Revue du Nord* 279, 70 (1988): 717–40.
- Mircea, Eliade. *The Forge and the Crucible, the Origins and Structure of Alchemy*. University of Chicago Press, 1978.
- Mol, Annemarie. "Actor-Network Theory: Sensitive Terms and Enduring Tensions." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 50 (2010): 253–59.
- Monnet, Antoine Grimoald. "Traité Des Eaux Minérales Avec Plusieurs Mémoires De Chymie Relatifs À Cet Objet." A Paris, Chez P. Fr.

- Didot le Jeune, Quai des Augustins, près du Pont S. Michel, à S. Augustin, 1768.
- Montpensier, Anne-Marie-Louise-Henriette d'Orléans. "Mémoires De Mlle De Montpensier, Petite-Fille De Henri Iv, Collationnés Sur Le Manuscrit Autographe Avec Notes Biographiques Et Historiques." par A. Chérueil, à Paris, 1858–1859.
- Mortimer, Ian. "The Rural Medical Marketplace in Southern England, C.1570–1720." In *Medicine and the Market in England and Its Colonies C. 1450-C. 1850*, edited by Mark J. S. Jenner and Patrick Wallis, 69–87. London: Palgrave Macmillan, 2007.
- Mousnier, Roland. "Les Concepts D'« Ordres » D'« États », De « Fidélité » Et De « Monarchie Absolue » En France De La Fin Du Xve Siècle À La Fin Du Xviie Siècle." *Revue Historique des Armées* 247, 502, no. 2 (1972): 289–312.
- Newman, William R. *Atoms and Alchemy: Chymistry and the Experimental Origins of the Scientific Revolution*. Chicago: University of Chicago Press, 2006.
- Nye, Mary Jo. *Science in the Provinces: Scientific Communities and Provincial Leadership in France, 1860–1930*. Berkeley, Los Angeles, London: University of California Press, 1986.
- Oger, Yves. *Les Bureaux De Distribution Des Eaux Minérales Aux Xviie Et Xviie Siècles*. multigr., 1999.
- Opel, Andy. "Constructing Purity: Bottled Water and the Commodification of Nature." *Journal of American Culture* 22, no. 4 (1999): 67–76.
- Oudin-Bastide, Caroline. "L'esprit D'ingénieur : Pensée Calculatoire Et Éthique Économique." *Revue Française de Socio-Économie* 1, no. 1 (2008): 131–52.
- Palissy, Bernard. "Oeuvres De Bernard Palissy." edited by Barthelemy Faujas de Saint-Fond, Nicholas Gobet and Nicolás Ruault. Chez Ruault, à Paris, 1777.
- Palmer, Richard. "In Bad Odour: Smell and Its Significance in Medicine from Antiquity to the Seventeenth Century." In *Medicine and the Five Senses*, edited by William F. Bynum and Roy Porter: Cambridge University Press, 1993.
- Paquier, Serge. *L'eau À Genève Et Dans La Région Rhône-Alpes (Xix–Xxe Siècles)*. Histoire De L'innovation Et Entreprise. l'Harmattan, 2007.
- Parascandola, John, and Aaron J. Ihde. "History of the Pneumatic Trough." *Isis* 60, no. 3 (1969): 351–61.
- Penez, Jérôme. *Dans La Fièvre Thermale : La Société Des Eaux Minérales De Châtel-Guyon, 1878–1914*. Clermont-Ferrand: Institut d'études du Massif Central, 1994.
- . *Histoire Du Thermalisme En France Au Xixe Siècle, Eau, Médecine Et Loisirs*. Economica, 2004.
- . "Les Réseaux D'investissement Dans Le Thermalisme Au Xixe Siècle En France." *In Situ*, no. 4 (2004).

- Perkins, John. "Chemistry Courses, the Parisian Chemical World and the Chemical Revolution, 1770–1790." *Ambix* 57, no. 1 (2010): 27–47.
- Petitfils, Jean-Christian. "De La Monarchie Absolue À La Monarchie Impossible." *Revue Des Deux Mondes* (2016): 26–38.
- . *L'affaire Des Poisons, Crimes Et Sorcellerie Au Temps Du Roi-Soleil*. Paris: Perrin, 2009.
- Piasenza, Paolo. "Juges, Lieutenants De Police Et Bourgeois À Paris Au Xviiie Et Xviiiie Siècles." *Annales ESC* 5 (1990): 1189–215.
- Piernas, Gersende. "Introduction À L'histoire Des Hôpitaux Thermaux Militaires En France (Xviiiie–Xixe siècles)." In *La Santé Des Populations Civiles Et Militaires: Nouvelles Approches Et Nouvelles Sources Hospitalières, Xviiie–Xviiiie siècles*, edited by Élisabeth Belmas and Serenella Nonnis-Vigilante, 113–49. Villeneuve d'Ascq: Presses universitaires du Septentrion, 2010.
- Pilcher, Jeffrey M. "Cultural Histories of Food." In *The Oxford Handbook of Food History*, edited by Jeffrey M. Pilcher, 23–40: Oxford University Press, 2012.
- Pinch, Trevor J, and Wiebe E. Bijker. "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other." *Social Studies of Science* 14, no. 3 (1984): 399–441.
- Pirogovskaya, Maria. "Constructing the Delicate Subject. Eighteenth-Century Russian Medical Books on Strong Flavours and Feeble Fibres." In *Taste and Smell in the Eighteenth Century*, edited by Beatrijs Vanacker, Lieke van Deinsen and Inger Leemans, 93–112. Hilversum: Verloren, 2017.
- Pliny. "Natural History." Harvard University Press, 2004.
- Poisson, Jacques. "Le Voyage Aux Eaux. Histoire De La Desserte Ferroviaire Des Stations Thermales." *Revue d'histoire des chemins de fer* 31 (2004): 201–34.
- Pomme, Pierre. "Traité Des Affections Vaporeuses Des Deux Sexes ; Où L'on a Tâché De Joindre À Une Théorie Solide Une Pratique Sûre, Fondée Sur Des Observations : Par M. Pomme." A Lyon, Chez Benoit Duplain, Libraire, grande rue merciere, à l'Aigle, 1767.
- Porter, George. "Joseph Priestley and His Contemporaries." *The Journal of General Education* 27, no. 2 (1975): 91–100.
- Porter, Roy. "The Medical History of Waters and Spas." *Medical History* 34, no. 10 (1990): 7–12.
- Postigo, Inmaculada Almahano y Encarnación, ed. *Turismo Y Salud: Traducción, Interpretación Y Comunicación Intercultural En El Sector Turístico Europeo*. Granada: Comares, 2013.
- Poussou, Jean-Pierre. "Sur Le Rôle Des Transports Terrestres Dans L'économie Du Sud-Ouest Au Xviiiie Siècle." *Annales du Midi : revue archéologique, historique et philologique de la France méridionale* 90, n°138–139 (1978): 389–412.

- Powers, John C. "Fire Analysis in the Eighteenth Century: Herman Boerhaave and Scepticism About the Elements." *Ambix* 61, no. 4 (2014): 385–406.
- Principe, Lawrence. *New Narratives in Eighteenth-Century Chemistry*. Dordrecht: Springer, 2007.
- . "Rêves D'or: La Surprenante Longévitité De L'alchimie Au Coeur De La Chimie." *L'Actualité chimique* 424 (2017): 68–71.
- . *The Secrets of Alchemy*. University of Chicago Press, 2012.
- . *The Transmutations of Chymistry: Wilhelm Homberg and the Académie Royale Des Sciences*. University of Chicago Press, 2020.
- Prival, Marc. *De La Source À La Fontaine Et À La Maison : Histoire De L'eau Potable Dans Le Puy-De-Dôme*. Editions des monts d'Auvergne, 2012.
- Pugliano, Valentina. "Pharmacy, Testing, and the Language of Truth in Renaissance Italy." *Bulletin of the History of Medicine* 91, no. 2 (2017): 233–73.
- Rabier, Christelle. "L'histoire De La Médecine Au Prisme Du Marché: Perspectives Britanniques." *Recherches britanniques* 1, no. 1 (2011): 17–36.
- Radhi, Jazi, and Shehadeh Kamal. "Séparation De La Pharmacie De La Médecine." *Revue d'histoire de la pharmacie* 84 (1996): 509–11. Actes du XXXIe Congrès International d'Histoire de la Pharmacie.
- Ramsey, Matthew. *Professional and Popular Medicine in France, 1770–1830*. Cambridge: Cambridge University Press, 2002.
- Rao, C. N. R., and Indumati Rao. "Antoine Laurent Lavoisier (1743–1794) — Father of Chemistry." In *Lives and Times of Great Pioneers in Chemistry, (Lavoisier to Sanger)*, 324: Default Book Series, 2016.
- Raulin, Joseph. "Exposition Succincte Des Principes Et Des Propriétés Des Eaux Minérales, Qu'on Distribue Au Bureau Général De Paris." De l'Imprimerie de Claude Herissant, rue Neuve Notre-Dame, 1775.
- . "Traité Analytique Des Eaux Minérales En Général, De Leurs Propriétés Et De Leur Usage Dans Les Maladies." Chez Vincent, Imprimeur-Libraire rue des Mathurins, Hôtel de Clugny, 1772.
- . "Traité Des Eaux Minérales De Verdusan, Connues Sous Le Nom D'eaux Minérales De Castera Vivent, Avec Leur Analyse, Leurs Propriétés & Leur Usage Dans Les Maladies, Fait Par Ordre Du Gouvernement." Chez Valade, Libraire, rue St. Jacques, vis-à-vis celle des Mathurins, 1772.
- Réaumur, René Antoine Ferchault de. "Explication Des Principes Établis Par M. De Reaumur, Pour La Construction Des Thermometres Dont Les Degrés Soient Comparables." 1732.
- "Récit Du Voyage De Sa Majesté L'empereur Joseph Ii. Dans Les Pays-Bas L'année M. Dcc. Lxxxi.: Avec Plusieurs Anecdotes." Chez P. J. Hanicq, Imprimeur & Libraire près la Baille de fer, 1781.

- Reinarz, Jonathan. *Past Scents : Historical Perspectives on Smell*. Studies in Sensory History. Edited by Mark M. Smith. University of Illinois Press, 2014.
- Rey, Roselyne. "L'école De Santé De Paris Sous La Révolution : Transformations Et Innovations." *Histoire de l'éducation* 57 (1993): 23–57.
- Rieder, Philip. "La Médecine Pratique : Une Activité Heuristique À La Fin Du 18e Siècle ?". *Dix-huitième siècle* 47, no. 1 (2015): 135–48.
- . "La Pharmacie Gosse Et Les Eaux Minérales Artificielles À Genève (1789–1805)." *Thermalisme et Politique (XVIIe–XIXe siècle)*, 2021.
- Rieder, Philip, and François Zanetti, eds. *Materia Medica, Savoirs Et Usages Des Médicaments Aux Époques Médiévales Et Modernes*. Genève: Librairie Droz, 2018.
- Robert, George. "Le Premier Médecin Du Roi." *Histoire des sciences médicales* XXXII, no. 4 (1998): 373–78.
- Robert, Sandrine, and Nicolas Verdier. "La Route En Train De Se Faire." *Les Nouvelles de l'archéologie* 115 (2009): 51–56.
- Roberts, Lissa. "The Death of the Sensuous Chemist: The 'New' Chemistry and the Transformation of Sensuous Technology." *Studies in History and Philosophy of Science* 26, no. 4 (1995): 503–29.
- . "Filling the Space of Possibilities: Eighteenth-Century Chemistry's Transition from Art to Science." *Science in Context* 6 (1993): 511–53.
- Roche, Daniel. *Le Siècle Des Lumières En Province. Académies Et Académiciens Provinciaux, 1680–1789*. Paris, The Hague: Mouton, 1978.
- . "Le Temps De L'eau Rare Du Moyen Age À L'époque Moderne." *Annales. Economies, sociétés, civilisations* 39, no. 2 (1984): 383–99.
- Roger, Jacques. *Les Sciences De La Vie Dans La Pensée Française Au XVIIIe Siècle*. Paris: Albin Michel, 1993. 1963.
- Romon, Christian. "Le Monde Des Pauvres À Paris Au XVIIIe Siècle." *Annales. Histoire, Sciences Sociales* 37, no. 4 (1982): 729–63.
- Rothschild, Emma. "Commerce and the State: Turgot, Condorset and Smith." *The Economic Journal* 102, 414 (1992): 1197–210.
- Rouelle, Guillaume-François. "Analyse De L'eau Minérale De Monsieur & De Madame De Calsabigi, Nouvellement Découverte En Leur Maison De Passy." In *Analyses Chimiques Des Nouvelles Eaux Minérales, Vitrioliques, Ferrugineuses, Découvertes a Passy Dans La Maison De Madame De Calsabigi. Avec Les Propriétés Médicinales De Ces Mêmes Eaux, Fondées Sur Les Observations Des Médecins & Chirurgiens Des Plus Célèbres, Dont on Rapporte Les Certificats Authentiques.*, edited by Gabriel François Venel and Pierre Bayen, 53–62, 1757.
- Russell, C. A. "Jacob Berzelius, the Emergence of His Chemical System." *Med Hist.* 26, no. 3 (1982): 364–65.

- Scheid, John, Marilyn Nicoud, Didier Boisseuil, and Joël Coste, eds. *Le Thermalisme, Approches Historiques Et Archéologiques D'un Phénomène Culturel Et Médical*. Paris: CNRS Éditions, 2015.
- Schilling, Lothar, and Jakob Vogel, eds. *Transnational Cultures of Expertise, Circulating State-Related Knowledge in the 18th and 19th Centuries*. Berlin, Boston: Walter de Gruyter GmbH, 2019.
- Schmid, Susanne, and Barbara Schmidt-Haberkamp, eds. *Drink in the Eighteenth and Nineteenth Centuries*: Routledge, 2014.
- Schwartz, Robert M. *Policing the Poor in Eighteenth-Century France*. UNC Press Books, 2017.
- Scott, E. L. "History of Chemistry: Carl Scheele (1742–1786) and the Discovery of Oxygen." *Nature* 322, 305 (1986).
- . "The "Macbridean Doctrine" of Air: An Eighteenth-Century Explanation of Some Biochemical Processes, Including Photosynthesis." *Ambix* 17, no. 1 (1970): 43–57.
- Seitz, Frederick. "Henry Cavendish: The Catalyst for the Chemical Revolution." *Notes and Records of the Royal Society of London* 59, no. 2 (2005): 175–99.
- Sgard, Jean. "L'échelle Des Revenus." *Dix-huitième Siècle* 14 (1982): 425–33.
- Shapin, Steven. *Changing Tastes: How Foods Tasted in the Early Modern Period and How They Taste Now*. Salvia Småskrifter. Vol. 14, Uppsala: Tryck Wikströms, for the University of Uppsala, 2011.
- Shapin, Steven, and Simon Schaffer. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton University Press, 2011.
- Shaw, Peter. "An Enquiry into the Contents, Virtues, and Uses, of the Scarborough Spaw-Waters, with the Method of Examining Any Other Mineral-Water." London, Printed for the Author, 1734.
- Shovlin, John. "Regenerating the Patrie: Agronomists, Tax Reformers, and Physiocrats." In *The Political Economy of Virtue: Luxury, Patriotism, and the Origins of the French Revolution*, 80–117: Cornell University Press, 2006.
- Sicard, André. "La Chirurgie Française Au Xviiiè Siècle." *Histoire des Sciences Médicales* XXVIII, no. 2 (1994): 93–99. Communication présentée à la séance du 20 mars 1993 de la Société française d'Histoire de la Médecine.
- Simon, Jonathan. "Analysis and the Hierarchy of Nature in Eighteenth-Century Chemistry." *Br J Hist Sci.* 35, 1 (2002): 1–16.
- . *Chemistry, Pharmacy and Revolution in France, 1777–1809*. Aldershot, Burlington: Ashgate Publishing Company, 2005.
- Smith, John. "Traité Des Vertus Medicinales De L'eau Commune... Par M. Smith. Et Le Grand Febrifuge Du Docteur Hancock. Traduit De L'anglois (Par P. Noguez). On Y a Ajoûté Les Theses De Messieurs Hecquet Et Geoffroy, Avec Quelques Réflexions Sur Le Remede De

- L'eau À La Glace." 340p. Ches Guillaume Cavalier fils, rue S. Jacques, près la Fontaine S. Severin au Lys d'Or, 1626.
- Sommerset, Anne. *The Affair of the Poisons : Murder, Infanticide and Satanism at the Court of Louis XIV*. Londres: Orion Publishing, 2003.
- Sousa-Dias, José Pedro. "Mineral Waters, Spas and Therapeutics in Seventeenth and Eighteenth Century Portugal." *Portuguese Journal of Social Science* 16 (2017): 37–51.
- Stengers, Isabelle. *L'invention Des Sciences Modernes*. Flammarion, 1995. 1993.
- Sueur, Philippe. *Histoire Du Droit Public Français Xve–Xviii Siècle, Affirmation Et Crise De L'etat Sous L'ancien Régime, La Genèse De L'état Contemporain*. Vol. 2: Presses Universitaires de France, 2007.
- Sukopp, Thomas. "Discoveries of Oxygen and the "Chemical Revolution" in the Context of European Scientific Networks." In *Knowledge Communities in Europe*, edited by B. Schweitzer and Thomas Sukopp, 15–47. Wiesbaden: Springer, 2018.
- Sumner, James. "John Richardson, Saccharometry and the Pounds-Per-Barrel Extract: The Construction of a Quantity." *BJHS* 34 (2001): 255–73.
- Swann, Julian. "'Le Roi Demande, Les États Consent': Royal Council, Provincial Estates and Parlements in Eighteenth-Century Burgundy." In *The Eighteenth-Century Composite State*, edited by Hayton D.W., Kelly J. and Bergin J., 163–82. London: Palgrave Macmillan, 2010.
- Szulman, Éric. *La Navigation Intérieure Sous L'ancien Régime*. Rennes: Presses Universitaires de Rennes, 2014.
- Tardy, Emmanuel. "Dissertation Sur Le Transport Des Eaux De Vichy, Avec La Manière De Se Conduire Avec Succès Dans Leur Usage." A Moulins, Chez Jean Faure, Imprimeur-Libraire, ruë de Paris, 1755.
- Taton, René, ed. *Enseignement Et Diffusion Des Sciences En France Au Dix-Huitième Siècle*. Paris: Hermann, 1986.
- Thackray, Arnold, ed. *Constructing Knowledge in the History of Science* Vol. 10, Osiris. Chicago: The Univeristy of Chicago Press, 1995.
- Thomas, Nicholas C. "The Early History of Spectroscopy." *Journal of Chemical Education* 68, no. 8 (1991).
- Thompson, Edward P. "History from Below." *Times Literary Supplement* 3345 (1966): 279–80.
- . *The Making of the English Working Class*. London: Penguin, 2013. 1963.
- Thompson, Edward Palmer. "The Moral Economy of the English Crowd in the Eighteenth Century." *Past & Present* 50 (1971): 76–136.
- Tomory, Leslie. "Gas Lighting and Pneumatic Chemistry." In *Progressive Enlightenment: The Origins of the Gaslight Industry, 1780–1820*, edited by Leslie Tomory, 13–36: MIT Press, 2012.
- Tricoire, Damien. *Enlightened Colonialism, Civilization Narratives and Imperial Politics in the Age of Reaso*. Springer, 2017.

- Valenza, Janet. *Taking the Waters in Texas: Springs, Spas, and Fountains of Youth*. Austin: University of Texas Press, 2000.
- Vanacker, Beatrijs, Lieke van Deinsen, and Inger Leemans, eds. *Taste and Smell in the Eighteenth Century*. Hilversum: Verloren, 2017.
- Vandermonde, Charles Augustin. “Dictionnaire Portatif De Santé” A Paris, chez Vincent, Imprimeur Libraire de Mgt le Duc de Bourgogne, rue S. Severin, 1759.
- Vasset, Sophie. *Décrire, Prescrire, Guérir : Médecine Et Fiction Dans La Grande-Bretagne Du Xviii Siècle*. Québec: Presses de l’Université de Laval, Éditions du CIERL, 2011.
- Vatin, François. “L’esprit D’ingénieur : Pensée Calculatoire Et Éthique Économique.” *Revue Française de Socio-Économie* 1, no. 1 (2008): 131–52.
- Viel, Claude. “Antoine-François De Fourcroy (1755–1809), Promoteur De La Loi De Germinal an Xi.” *Revue d’histoire de la pharmacie* 91, 339 (2003): 377–94.
- . “L’évolution Du Laboratoire Et Des Instruments De Chimie Vue Au Travers Des Ouvrages À Planches, Du Xvii À La Fin De La Première Moitié Du Xixe Siècle.” *Revue d’histoire de la pharmacie* 96, n°363 (2009): 277–94.
- Weisz, George. “Le Thermalisme En France Au Xxe Siècle.” *Med Sci* 18, no. 1 (2002): 101–08.
- . *The Medical Mandarins. The French Academy of Medicine in the Nineteenth and Early Twentieth Century*. Oxford: Oxford University Press, 1995.
- White, Bruce D., and Walter W. Woodward. ““A Most Exquisite Fellow” — William White and an Atlantic World Perspective on the Seventeenth-Century Chymical Furnace.” *Ambix* 54, no. 3 (2013): 285–98.
- White, Eugene, N. “From Privatized to Government-Administered Tax Collection: Tax Farming in Eighteenth-Century France.” *The Economic History Review* 57, no. 4 (2005): 636–63.
- Widmalm, Sven. “A Commerce of Letters: Astronomical Communication in the 18th Century.” *Science Studies* 5, no. 2 (1992): 43–58.
- Will, Richard. “Bottled Water: The Pure Commodity in the Age of Branding.” *Journal of Consumer Culture* 6, no. 3 (2006): 303–25.
- Woronoff, Denis, ed. *La Circulation Des Marchandises Dans La France De L’ancien Régime*. Paris: Comité pour l’Histoire Économique et Financière de la France/LGDJ, 1998.
- Zedinger, Renate. *Lorraine Et Pays-Bas Autrichiens Au Xviii Siècle*. Winkler, 2010.

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# Appendices

## Appendix n°[1]: The analysts' main field

	Number (out of 93)	Percentage of total
<b>Physician</b>	64	68.8%
<b>Apothecary</b>	14	15.1%
<b>Chemist</b>	11	11.8%
<b>Surgeon</b>	6	6.5%
<b>Unknown</b>	9	9.7%
<b>Other</b>	1	1.1%

## Appendix n°[2]: Inclusion of the different steps of analysis

Step	Environment description	Physical measurements	Sensory analysis	Reagents	Dry analysis	Air analysis
<b>Amount (out of 93)</b>	67	53	86	83	83	54
<b>Percentage</b>	72%	57%	92.5%	89.2%	89.2%	58.1%

## Appendix n°[3]: Full list of vocabulary used in sensory analysis

Visual vocabulary by n° of occurrences		Olfactive vocabulary by n° of occurrences		Taste vocabulary by n° of occurrences		Textural vocabulary by n° of occurrences	
Limpide	32	Sans odeur	17	Fer / Ferrugineuse	18	Froide	5
Claire	30	Soufre / Sulfureuse	15	Salé	18	Légère	4
Transparente	12	Foye de soufre	6	Piquante	17	Onctueuse / Onctuosité	4

Blancheur / Tâche blanche	3	Désagréable	6	Stiptique	14	Bouillonnante / Gaz frémissant	3
Ochreux	3	Hepar / Hepar sulfuris	5	Amère / Amertume	12	Savoneuse	3
Pellicule / Pel- lucide / Toile à la surface	3	Oeuf couvé	4	Sans saveur	10	Grasse	2
Colorée / Point colorée	3	Lessive / Lixivielle	3	Aigrette / Ai- greur	9	Douce	2
Jaune citrin clair / Jaune de citron delayé	2	Fer / Ferru- gineuse	3	Agréable / Point désagré- able	8	Chaude	2
Diaphane	2	Encre	2	Martial	8	Bulles	2
Globules / Par- ticules	2	Bitume	2	Acide	7	Huile / Huile fine	2
Belle	1	Urine	2	Âpre	6	Bitumineuse	1
Arc-en-ciel	1	Alkali volatil	1	Astriction / As- tringeante	6	Aérée	1
Vapeur blanche	1	Acide muri- atique	1	Désagréable	6	Rend les doigts glis- sants	1
Netteté	1	Acide gazeux	1	Douceâtre / Douceur	5	Gluante	1
Filaments blancs	1	Pénétrante	1	Âcre	5	Jets	1
Trouble	1	Infecte	1	Fade	5	Eau distillée	1
Reptiles	1	Oeuf à demi pourri	1	Soufre / Sul- fureuse	5	Visqueuse	1
Incrustation	1	Matière hu- maine	1	Vitriol	5	Saumâtre	1

Efflorescence	1	Fétide	1	Acidule	4	Cotoneux	1
Couleur sombre	1	Esprit sulfureux	1	Austère	4	Pétillante	1
Ternis le verre	1	Naphte	1	Desséchante / Sécheresse	4	-	
Salie	1	Métallique	1	Rouillée / Rouillure de fer	4	-	
Couleur de l'iris	1	Empireu-matique	1	Insipide	4	-	
Bleuâtre	1	Champagne	1	Vineuse	4	-	
Noircit les dents	1	Esprit de vin	1	Sel marin	4	-	
Jaune rouge	1	Ferrugino-sulfureuse	1	Acerbe	3	-	
-		Lessive de matière alcaline	1	Agaçante	3	-	
-		Jus	1	Salure	3	-	
-		Fumet minéral	1	Solution de vitriol / Solution de vitriol de Mars	3	-	
-		Sel marin	1	Impossible à garder en bouche / Insupportable	3	-	
-		Rouille	1	Eau qui éteint le fer rouge	2	-	
-		Phlogistique	1	Croquant	2	-	
-		Vitriol blanc	1	Encre	2	-	
-		Violettes	1	Frais	2	-	
-		Sensible	1	Oeuf couvé	2	-	

-		Savon	1	Minéral	2	-	
-	-			Lessive / Lex- iviel	2	-	
-	-			Dégoutant	1	-	
-	-			Changeante	1	-	
-	-			Eau Commune gazeuse	1	-	
-	-			Eau de puit	1	-	
-	-			Atramentaire	1	-	
-	-			Alkali minéral	1	-	
-	-			Dure	1	-	
-	-			Alcaline	1	-	
-	-			Chaleur	1	-	
-	-			Brûle	1	-	
-	-			Fatiguant le gosier	1	-	
-	-			Empiresme	1	-	
-	-			Hépatique	1	-	
-	-			Fondant	1	-	
-	-			Foye de soufre	1	-	
-	-			Éventée	1	-	
-	-			Matière talqueuse	1	-	
-	-			Sulfate de fer	1	-	
-	-			Mussilagineuse	1	-	
-	-			Saveur fixe	1	-	
-	-			Non désalté- rante	1	-	
-	-			Mordant	1	-	

-	-	Pétillante	1	-
-	-	Répugnant	1	-
-	-	Nitreux	1	-
-	-	Poudre à canon	1	-
-	-	Supportable	1	-
-	-	Raclante	1	-
-	-	Rafraîchissante	1	-
-	-	Vapide	1	-
-	-	Tartre de vin	1	-
-	-	Saveur réelle	1	-
-	-	Terreuse	1	-
-	-	Plat	1	-
-	-	Piquette	1	-
-	-	Rend gai	1	-
-	-	Urineux	1	-
-	-	Vin mousseux	1	-

#### Appendix n° [4]: Full list of reagents

List of reagents used in multiple analyses		List of reagents used in one analysis	
Reagent	Occurrences	Reagent	Occurrences
Noix de galle	69	Acète de plomb	1
Sirop de violette	60	Acide acéteux	1
Dissolution d'argent	41	Acide arsénical	1
Acide vitriolique	39	Acide de tartare	1
Alkali fixe	37	Acide de vinaigre	1
Dissolution de mercure	36	Acide phosphorique	1
Teinture de tournesol	34	Acide végétal	1
Alkali volatil	32	Alkali de soude	1
Huile de tartre	27	Alkali fixe fluor	1
Savon	25	Alkali fixe non résous	1
Pièce argent	22	Alkali fixe résous	1

Acide minéral	17	Alkali fluor	1
Solution de sublimé corrosif	17	Alkali sanguin	1
Eau de chaux	16	Alun	1
Alkali phlogistique	14	Arsenic blanc	1
Alkali	11	Beurre d'antimoine	1
Acide nitreux	10	Bismuth	1
Bleu de prusse	10	Bois de chêne	1
Esprit de nitre	10	Chaux d'antimoine	1
Alkali prussien	9	Chaux de mercure	1
Esprit de vinaigre	9	Chaux de plomb	1
Dissolution de sel de Saturne	8	Coquillages calcinés	1
Lait	8	Corail	1
Cuivre	7	Cristal de vitriol	1
Esprit de vitriol	7	Dissolution de spath	1
Papier bleu	7	Eau de neige	1
Acide marin	6	Eau forte	1
Teinture de bois de fer-nambouc	6	Écorce d'aulne	1
Vin rouge	6	Esprit volatil de sel d'ammoniac	1
Fer poli	5	Extrait de Saturne	1
Sel de tartre	5	Huile de vitriol rectifié	1
Acide de sucre	4	Liqueur animalisée	1
Acide sulfureux	4	Magnésie	1
Alkali minéral	4	Mercure sublimé	1
Esprit de vin	4	Nitrate de mercure	1
Foie de soufre	4	Nitrate de plomb	1
Huile de chaux	4	Or	1
Huile de vitriol	4	Oxalate d'ammoniac	1
Muriate de baryte	4	Papier à sucre	1
Sel d'ammoniac	4	Platine	1
Vinaigre	4	Plomb	1
Vinaigre de Saturne	4	Prussiate de potasse	1
Vitriol de Mars	4	Quinquina	1
Acide oxatique	3	Rapure de Myrobolons-Chebules	1
Ammoniac	3	Sang	1
Décoction de terra merita	3	Sel sulfureux	1
Dissolution de sel de Glauber	3	Suc de pavot	1
Esprit de soufre	3	Surs aigres de limon	1
Nitre lunaire	3	Teinture de bleuet	1
Nitre mercuriel	3	Teinture de fleur de mauve	1
Soude	3	Teinture de garance	1
Teinture de roses	3	Vif argent	1

Vitriol verd	3	Yeux d'écrevisses	1
Acide muriatique	2	Zinc	1
Alkali du tartre	2		
Alkali végétal	2		
Alkali volatil caustique	2		
Craie ammoniacale	2		
Cristaux de lune	2		
Dissolution de chaux d'arsenic	2		
Dissolution métallique	2		
Eau de chaux prussienne	2		
Écorce de grenade	2		
Esprit de sel	2		
Feuilles de thé	2		
Liqueur de Meyer	2		
Mercure	2		
Muriate de chaux	2		
Nitrate d'argent	2		
Potasse	2		
Sel d'Epsom	2		
Sel marin	2		
Solution de mercure sublimé	2		
Végétaux	2		
Verjus	2		

### Appendix n°[5]: Price of mineral waters at the Paris bureau (1783)

<b>Waters sold in Paris</b>	<b>Price livres (ft)</b>	<b>Price deniers (d)</b>	<b>Price denier per pint</b>
<b>Passy</b>	6½ (1 pint)	72	72
<b>Forges</b>	15½ (1 pint)	180	180
<b>Sainte Reine</b>	15½ (1 pint)	180	180
<b>Merlange</b>	3 <sup>n</sup> (4 pints)	720	180
<b>Vichy</b>	4 <sup>n</sup> (4 pints) 1 <sup>n</sup> (1 pint)	960	240
<b>Bourbonne</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Bussang</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Châtel-Guyon</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Saint-Mion</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Pougues</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Contrexéville</b>	1 <sup>n</sup> 10½ (1 pint)	360	360
<b>Plombières</b>	2 <sup>n</sup> (1 pint)	480	480
<b>Spa</b>	2 <sup>n</sup> (1 pint)	480	480

<b>Selz</b>	2 <sup>n</sup> (1 pint)	480	480
<b>La Mothe</b>	8 <sup>n</sup> (4 pints) or 2 <sup>n</sup> 3j (1 pint) (516d / p)	1,920	480
<b>Vals</b>	9 <sup>n</sup> (4 pints) or 2 <sup>n</sup> 8j (1 pint) (576d / p)	2,160	540
<b>Balaruc</b>	9 <sup>n</sup> (4 pints) or 2 <sup>n</sup> 8j (1 pint) (576d / p)	2,160	540
<b>Cransac</b>	9 <sup>n</sup> (4 pints) or 2 <sup>n</sup> 8s (1 pint) (576d / p)	2,160	540
<b>Cauterets</b>	2 <sup>n</sup> 8j (1 pint)	576	576
<b>Bonne</b>	2 <sup>n</sup> 8j (1 pint)	576	576
<b>Barèges</b>	2 <sup>n</sup> 8j (1 pint)	576	576
<b>Pouillon</b>	2 <sup>n</sup> 8j (1 pint)	576	576
<b>Bagnères</b>	2 <sup>n</sup> 10j (1 pint)	600	600
<b>Sedlitz</b>	5 <sup>n</sup> 5j (3 chopines)	1,260	840
<b>Seydchutz</b>	5 <sup>n</sup> 10j (3 chopines)	1,320	880
<b>Châteldon</b>	8 <sup>n</sup> (1 pint)	1,920	1,920

#### Appendix n°[6]: Price of mineral waters in the Lyon bureau (ca. 1773)

<b>Waters sold in Lyon</b>	<b>Price livres (ft)</b>	<b>Price deniers (d)</b>	<b>Price (denier per pint)</b>
<b>Fonfore</b>	1 <sup>n</sup> (2 pints)	240	120
<b>Sainte Reine</b>	1 <sup>n</sup> 10j (2 pints)	360	180
<b>Plombières</b>	1 <sup>n</sup> 10j (2 pints)	360	180
<b>Vic le Comte</b>	1 <sup>n</sup> 10j (2 pints)	360	180
<b>Saint Alban</b>	1 <sup>n</sup> 10 (2 pints)	360	180
<b>la Mothe</b>	1 <sup>n</sup> 15j (2 pints)	420	210
<b>Vals</b>	2 <sup>n</sup> (2 pints)	480	240
<b>Vichy</b>	2 <sup>n</sup> (2 pints)	480	240
<b>Mont d'Or</b>	1 <sup>n</sup> 10j (1 and a half pint)	360	240
<b>Balaruc</b>	2 <sup>n</sup> 15j (2 pints)	660	330
<b>Forges</b>	2 <sup>n</sup> 5j (1 and a half pint)	540	360
<b>Cransac</b>	3 <sup>n</sup> (2 pints)	720	360
<b>Selz</b>	2 <sup>n</sup> 5j (1 and a half pint)	540	360
<b>Guesbac</b>	2 <sup>n</sup> 5j (1 and a half pint)	540	360
<b>Passy</b>	8 <sup>n</sup> (4 pints)	1,920	480
<b>Schwalbach</b>	2 <sup>n</sup> 5j (1 pint)	540	540
<b>Spa</b>	2 <sup>n</sup> 10j (1 pint)	600	600

<b>Cauterets</b>	2 <sup>te</sup> 10j (1 pint)	600	600
<b>Bonne</b>	2 <sup>te</sup> 10j (1 pint)	600	600
<b>Barèges</b>	2 <sup>te</sup> 10j (1 pint)	600	600
<b>Selter</b>	5 <sup>te</sup> (2 pints)	1,200	600
<b>Sedlitz</b>	6 <sup>te</sup> (2 pints)	1,440	720
<b>Yeuret</b>	3 <sup>te</sup> (1 pint)	720	720

### Appendix n°[7]: Average price in each bureau

<b>Bureau</b>	<b>Average price in denier per pint</b>
Paris (1772)	526.7
Paris (ca. 1783)	503.7
Brioude (1773)	76.5
Marseille (1773)	150
Lyon (ca. 1773)	391.3
Fontainebleau (1773)	566

### Appendix n°[8]: Vessels used by the analysts

<b>Vessels</b>	<ul style="list-style-type: none"> <li>- Vaisseau en terre vernie</li> <li>- Vaisseau évaporatoire</li> <li>- Vaisseaux de verre neufs</li> <li>- Vaisseau de verre</li> <li>- Vaisseaux fermés</li> </ul>
<b>Cucurbits</b>	<ul style="list-style-type: none"> <li>- Cucurbite bien luttée</li> <li>- Cucurbite de verre</li> <li>- Cucurbite de verre avec un couvercle</li> <li>- Cucurbite tubulée</li> </ul>
<b>Terrines</b>	<ul style="list-style-type: none"> <li>- Terrine de grès neuve</li> <li>- Terrine de terre</li> <li>- Terrine bien vernissée neuve</li> <li>- Bassin de terre</li> </ul>
<b>Capsules</b>	<ul style="list-style-type: none"> <li>- Capsules de verres</li> <li>- Verre de montre</li> <li>- Capsules de porcelaine</li> <li>- Soucoupe à café bien vernissée</li> </ul>
<b>Vases</b>	<ul style="list-style-type: none"> <li>- Vase couvert</li> <li>- Vase d'argent</li> <li>- Vase de grès</li> <li>- Vase ouvert</li> </ul>
<b>Other glassware</b>	<ul style="list-style-type: none"> <li>- Évaporatoire de verre</li> <li>- Cornue</li> </ul>

	<ul style="list-style-type: none"> <li>- Alambic de verre couvert de son chapiteau</li> <li>- Matras</li> <li>- Retorte</li> <li>- Pots</li> <li>- Tube recourbé</li> </ul>
<b>Crucibles</b>	<ul style="list-style-type: none"> <li>- Creuset ouvert</li> <li>- Creuset fermé</li> <li>- Creuset hermétique</li> </ul>
<b>Miscellaneous</b>	<ul style="list-style-type: none"> <li>- Marmite couverte de son chapiteau</li> <li>- Chaudière de cuivre</li> <li>- Alembic de cuivre</li> <li>- Cuiller de fer</li> <li>- Vessie</li> <li>- Plat d'argent</li> <li>- Filtre</li> <li>- Plaque de fer</li> <li>- Aimant</li> <li>- Chapiteau</li> </ul>

### **Appendix n° [9]: Maps of mineral waters**

The maps appearing in the manuscript have been made specifically for this thesis (see Figure A). They are based on a map of Europe from ca. 1790. The towns have been marked using modernised spelling, since the eighteenth-century spelling was often inconsistent. The town of Vichy was for example spelled as either Vichy or Vichi. In addition, many of the spring towns of the eighteenth century have since acquired the suffix 'les-bains' or 'les-eaux' referring to their springs. Modern day Enghien-les-bains was for example known simply as Enghien. Another noteworthy change is the town of Bečov, in modern-day Czech Republic, which refers to the eighteenth-century mineral spring of Seydschutz.

A few of the springs mentioned in the archives have been omitted from the general map, when I was not able to reliably place them. Many of these springs are no longer in use, and therefore difficult to track. In addition, many names of springs appear in several regions. The name 'Bonne' for example is a rather common town name in France. In those cases, I have used other clues or indications in order to place the spring in the correct town, but this is not an entirely fool-proof system.



Figure A. Legend for all maps in chapters 1 and 2

## Appendix n°[10]: Relevant eighteenth-century units and currencies

### Currencies

**[Livre:]** The *livre* is the main unit of currency in eighteenth-century France. The *livre* replaced the separate currencies of *Livre Tournois* and *Livre Parisi* in 1667, (although the denominations still made a few appearances in the documents at hand here). A common abbreviation symbol for the *livre* is *tt*, in superscript, “3<sup>tt</sup>”.

**[Sol:]** The *sol* or *sous* (the two names are interchangeable), is a subdivision of the *livre*. In a *livre*, there are 20 *sols*. Common abbreviations for a *sol* are either “s.”, “f” or “j”.

**[Denier:]** The *denier* is the smallest subdivision of currency. There are 12 *deniers* in a *sol*, and 240 *deniers* in a *livre*. The most common abbreviation for a *denier* is “d”.

**[Franc:]** The name is sometimes used to refer to a *livre*, in the pre-revolutionary period. After the revolution, starting from 1795, the *franc* replaces the *livre*. This *franc* is worth almost the same as a *livre*. (1 *franc* = 1 *livre* 0 *sols* 3 *deniers*).

**[Décime:]** A *décime* is a 1/10<sup>th</sup> of a franc.

**[Centime:]** A *centime* is a 1/100<sup>th</sup> of a franc.

### Volumes

**[Pouce cube:]** This measure was used by chemists when measuring volumes of gas. A *pouce cube* (or cubed inch) refers to about 2 centilitres.

**[Pinte:]** A *pinte* or pint corresponds to a volume of about 0.9 litres.

**[Chopine:]** A *chopine* represents half a pint, or 0.45 litres.

**[Dame Jeanne:]** These glass bottles encased in a wicker basket typically contained 40 pints of liquid.

### Weights

**[Livre:]** Like the term ‘pound’ in English, it refers to a unit of both currency and weight. A *livre* refers to a weight of about 0.5 kilograms, but it was subject to regional variation.

**[Gros:]** This measure of weight was commonly used by chemists. It refers to a weight of 3.8 grams.

**[Grain:]** Also commonly used by chemists, this measure refers to a weight of 53 milligrams.



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