Between History and Memory

Centennial and Bicentennial Images of Lavoisier

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> History claims that the fall of the Bastille was itself a fete; it was the first celebration, the first commemoration, and it was, so to speak, already the first anniversary of the fall of the Bastille. Or, in fact, the zeroth anniversary.
> —Charles Péguy (1913)

THE BICENTENNIAL OF LAVOISIER'S DEATH on 8 May 1794 was the occasion for numerous commemorative events both in France and in other countries. So intense was the commemorative fervor among chemists that celebrating Lavoisier became nearly a full-time occupation for Lavoisier scholars.[1]

To be sure, commemorations are extremely useful for the historians of a discipline, providing them with extra funds and a larger audience than the usual handful of colleagues. But to the extent that they are rituals intended to reinforce the collective memory of a scientific community by evoking the achievements of an alleged founding father, they are not especially attractive to historians of science, who are usually more willing to revise than to repeat canonical accounts. Nevertheless, scientific commemorations are extremely interesting from a reflexive point of view, for the light they shed on the relationship between history and memory.

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Earlier versions of this essay were read at a Boston University Colloquium for Philosophy of Science, "The Construction of Scientific Memory," April 1995, and at the IVe Convegno Nazionale di Storia e Fondamenti della Chimica, Cagliari, September 1995. I thank Jonathan Simon and Pnina Abir-Am for their help with revisions of the manuscript. My acknowledgments also to Mme. Breton (Lycée Lavoisier, Paris), Denise Hazebrouck (Médiathèque d'Histoire des Sciences, Cité des Sciences et de l'Industrie), and Claudine Pouré (Archives de l'Académie des Sciences) for their assistance.

[1] I myself, from May to December 1994, was invited to give more than twenty talks on Lavoisier, in various countries around the world and in French institutions ranging from primary and secondary schools named after Lavoisier to the Academy of Sciences. For the epigraph see Charles Péguy, "Clio, dialogue de l'histoire et de l'âme païenne" (1913), in *Oeuvres en prose (1909–1914)* (Paris: Gallimard, 1961), pp. 997–1216, on p. 1083 (here and throughout, translations are mine unless otherwise indicated).

Isis, 1996, 87: 481–499

0021-1753/96/8401-0001$01.00

Professional historians working on recent, remembered events often come into conflict with the actors and witnesses of those events. They are generally inclined to distinguish their own historical, analytical productions, based on archival sources, from the memories collected by oral historians. But what happens when the memories of the past have been "frozen," stabilized through written reports that are transmitted from one generation to the next? In our modern terminology, the word *doxography* is used to refer to that kind of literature, strongly suggesting that it belongs to the realm of the "doxa," low-level nonscientific knowledge. This implied hierarchy of epistemological status suggests that doxography is a provisional pseudoknowledge that should be superseded by the "episteme," the scientific discourse provided by professional historians of science.

The case of Lavoisier shows, however, that intense scholarship in the historiography of the Chemical Revolution has not sufficed to discredit the so-called doxa. Two centuries after Lavoisier's death, conflicting accounts of the same historical episodes by working chemists and by professional historians coexist. The image of Lavoisier as the founding father of modern chemistry still reigns supreme in the collective memory of professional chemists, at least in France. The identification of Lavoisier with the discipline remains so strong that 1994 was declared the "Year of Chemistry" by the French Academy of Sciences.

Without entering into a survey of the recent literature on the Chemical Revolution, it should be noted that most Lavoisier scholars condemn the naive image of Lavoisier as the sole founder of modern chemistry.[2] To begin with, a number of studies have emphasized the disciplinary structure of chemistry prior to the Chemical Revolution. In contrast to traditional views of eighteenth-century chemistry as an immature, dependent science, these studies describe an established academic discipline, already distinguished from the chemical arts. Nor is the disciplinary coherence of pre-Lavoisian chemistry a recent discovery by professional historians, one that requires more time to replace the chemists' view in the popular imagination: it was assumed by Pierre Duhem as early as 1904 and clearly established by Hélène Metzger's works of the 1930s.[3] Approaching the problem from a different perspective, other scholars have recently considered a number of local traditions and more obscure chemists, supporters, professors, and translators who worked in the

[2] William A. Smeaton, "The Legacy of Lavoisier," *Bulletin for the History of Chemistry,* 1989, *5:*4–10; Arthur Donovan, *Antoine Lavoisier: Science, Administration, and Revolution* (Cambridge, Mass.: Blackwell, 1993); Jean-Pierre Poirier, *Antoine-Laurent de Lavoisier: Chemist, Biologist, Economist* (Philadelphia: Univ. Pennsylvania Press, 1996); and Bernadette Bensaude-Vincent, *Lavoisier, mémoires d'une révolution* (Paris: Flammarion, 1993) (an English translation is forthcoming from Harvard Univ. Press).

[3] Pierre Duhem, *Le mixte et la combinaison chimique* (Paris, 1902; rpt., Paris: Fayard, 1985); Hélène Metzger, *Newton, Stahl, Boerhaave et la doctrine chimique* (Paris, 1930; rpt., Paris: Blanchard, 1974); Metzger, *La philosophie de la matière chez Lavoisier* (Paris: Hermann, 1935); and Aldo Mieli, "Le rôle de Lavoisier dans l'histoire des sciences," *Archeion,* 1932, *14:*51–56. More recently, see, e.g., Maurice P. Crosland, "Chemistry and the Chemical Revolution," in *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science,* ed. G. S. Rousseau and Roy Porter (Cambridge: Cambridge Univ. Press, 1980), pp. 389–418; and Christoph Meinel, "Theory or Practice? The Eighteenth-Century Debate over the Scientific Status of Chemistry," *Ambix,* 1983, *30:*68–103. Evan Melhado advocates a clear distinction between the disciplinary formation of chemistry and the Chemical Revolution: Evan M. Melhado, "Metzger, Kuhn, and Disciplines," in *Studies on Hélène Metzger,* ed. Gad Freudenthal (Leiden/New York: Brill, 1990), pp. 111–134; and Melhado, "Toward an Understanding of the Chemical Revolution," *Knowledge and Society: Studies in the Sociology of Science Past and Present,* 1990, *8:*123–137. In highlighting investigations on the nature of salts by academic chemists, F. L. Holmes emphasizes the consistency of eighteenth-century chemistry as an "investigative enterprise" and describes the Chemical Revolution as a reconstruction of only one domain within a larger theoretical and practical framework; see Frederic L. Holmes, *Eighteenth-Century Chemistry as an Investigative Enterprise* (Berkeley: Univ. California Press, 1989).

shadow of Lavoisier; their studies provide a more decentralized view of the Chemical Revolution as a collective enterprise.[4]

How are we to understand the persistent gulf between scholarly reappraisals of the Chemical Revolution and the public image, mirroring the chemists' view, of Lavoisier? Does it suggest that professional scientists are simply reenacting past events in order to shape and legitimize their present activities, while professional historians are striving to reconstruct the "actual past"? That scientists are living in the realm of "memory" while historians are writing "real history"?

Through a survey of the centennial and bicentennial commemorations of Lavoisier's death, this essay reexamines the putative distinction between scientists' hagiographic commemorations and "objective" historical accounts.[5] While assuming that scientific commemorations are *loci memori* or social constructions of collective memory, I will argue that they are not necessarily unconcerned with historical authenticity and that, symmetrically, historical narratives are the result of a complex negotiation between memory, amnesia, and cultural reminiscence.

I

In 1882 the *Revue Scientifique,* a French popular science magazine, ironically noted that a statue dedicated to Lavoisier had recently been unveiled: "fortunately, it was not in France, nor in Paris—the city where this great man was born; it was simply in Bucharest." In 1890, when reviewing Marcellin Berthelot's *Lavoisier, la révolution chimique,* the *Revue Générale des Sciences* echoed complaints that Lavoisier was not honored by a statue in the city where he was born and where he died: the reviewer insidiously presumed that French Republicans were unwilling publicly to acknowledge responsibility for the "crime of May 8, 1794." Although Berthelot's volume might well be viewed as a commemoration more appropriate than a statue, the reviewer felt that Lavoisier's tragic end on the guillotine required an official gesture of repentance, publicly manifested in monumental stone. In fact, small statues of Lavoisier could be seen in Paris in 1890: one on the front wall of the town hall, rebuilt in a neo-Gothic style in 1882; and one in the main amphitheater of the Sorbonne, renovated after a decree in 1880.[6] It is true, however, that no direct decision to

[4] See, e.g., Arthur Donovan, *Philosophical Chemistry in the Scottish Enlightenment* (Edinburgh: Edinburgh Univ. Press, 1975); Ferdinando Abbri, "Tradizioni chimiche e meccanismi di defesa: G. A. Scopoli e la 'chimie nouvelle,'" *Archivo di Storia della Cultura,* 1991, *4:*75–92; Michelle Goupil, ed., *Lavoisier et la révolution chimique* (Paris: SABIX, École Polytechnique, 1992); Louis-Bernard Guyton de Morveau and Richard Kirwan, *A Scientific Correspondence during the Chemical Revolution,* ed. Emmanuel Grison, Michelle Goupil, and Patrice Bret (Berkeley: Office for the History of Science and Technology, Univ. California, 1994); Maurice P. Crosland, *In the Shadow of Lavoisier: The* Annales de Chimie *and the Establishment of a New Science* (BSHS Monographs) (Oxford: Alden, 1994); and Bernadette Bensaude-Vincent and Ferdinando Abbri, eds., *Lavoisier in European Context: Negotiating a New Language for Chemistry* (Canton, Mass.: Science History Publications, 1995).

[5] The bicentennial commemoration of Lavoisier's birth—in 1943, when Paris was occupied by German troops—will only be mentioned here. I found only one document concerning the exhibition organized at the Palais de la Découverte: Archives de l'Académie des Sciences, Paris, Lavoisier Papers, File 2.

[6] G. F. Rodwell, in *Revue Scientifique,* 1882, *4:*800 (Rodwell also published a biographical sketch of Lavoisier: *Rev. Sci.,* 1883, *5:*641–652); and Louis Olivier, "Lavoisier d'après M. Berthelot," *Revue Générale des Sciences,* 1890, *1:*572–576. On the main front wall of the Hôtel de Ville, Lavoisier is honored along with two Parisian writers, Molière and Voltaire, and another Parisian scientist who was politically active during the French Revolution, Lazare Carnot. In the Sorbonne, Lavoisier is one of six figures displayed on a crown all around the amphitheater: Robert de Sorbon is in front of Richelieu, Descartes in front of Pascal, and Lavoisier in front of Charles Rollin (a seventeenth-century writer, dean of Paris University, who suggested a reform of the curriculum and wrote a volume on pedagogy).

honor Lavoisier—for instance, by a symbolic transfer of his remains to the Pantheon, like the transfer of Pierre and Marie Curie in 1995—came from the French government for either the centennial or the bicentennial.

In 1894 an international subscription for erecting a monument to Lavoisier was raised by the French Academy of Sciences. In fact, the initiative came not from the academy itself but from an American Lavoisier Committee set up by Gustavus Hinrichs, a professor in Saint Louis. Urging his colleagues to celebrate the "Copernicus of chemistry" with a statue, Hinrichs reminded them that Lavoisier had opened his home to Benjamin Franklin and that French citizens had recently given Americans "the most unique statue in the world in New York." The academy organized a French committee, with academic chemists as correspondents, who raised funds in various countries. Jean-Albert Gauthier-Villars, a French publisher, acted as treasurer. He gathered money from individuals and from universities and industrial companies all over Europe and America; to these funds were added contributions from the academy itself and from the French Ministry of Public Instruction. By 1899 more than 100,000 francs had been collected, and the academy commissioned a statue from the French sculptor L. E. Barrias, a member of the Institut de France.[7]

The monument dedicated to Lavoisier was finally unveiled on 27 July 1900, during the World Exhibition held in Paris. Located on the Place de la Madeleine, not far from where Lavoisier lived at the end of his life, the statue was destroyed in 1940 by the German occupying troops. It depicted Lavoisier standing (and was so similar to the statue of Condorcet on the Quai de Conti that people said the sculptor used Condorcet and not Lavoisier as the model), with bas-reliefs representing scenes from his life on the base below. Lavoisier is portrayed on the bas-reliefs at work and in a social context. One shows him in his private laboratory, performing an experiment using a pneumatic apparatus. He is assisted by his wife, who sits in a corner and is apparently recording what is going on in a laboratory notebook. An unusual detail is the background figure of a technician or factotum carrying a heavy piece of equipment.[8] A second bas-relief depicts Lavoisier reporting an experiment on the calcination of lead before a host of colleagues from the academy (see Figure 1).

A striking feature of this monument is that it did not correspond to the public image of Lavoisier diffused by contemporary French popular books and magazines. Ferdinand Hoefer, for instance—a medical doctor, former secretary to the philosopher Victor Cousin, and the editor of the *Nouvelle biographie générale*—portrayed Lavoisier as a lone genius, working apart from the crowd. Much like Copernicus or Galileo, Lavoisier is depicted as bravely fighting a scientific establishment unable to understand his continual radical innovations.[9] I do not mean to suggest that the monument was explicitly aimed at counteracting the image of Lavoisier forged by journalists and popular writers, but it is clear enough that in the French collective memory the image of Lavoisier as an outsider or a marginal scientist competed with the image of Lavoisier as an academician and a "chef d'école." Such conflicting images show that scientific memory should not be viewed as a

[7] Gustavus Hinrichs, "Centenary Commemoration of Antoine Lavoisier, 1794–May 8, 1894," *Comptes-Rendus de l'Académie des Sciences,* 1894, *119:*1036; 1895, *120:*766; 1896, *123:*333; 1899, *129:*855–859, 985–986. Contributions came from France, Alsace, Germany, the United Kingdom, Austria-Hungary, Belgium, the United States, Greece, Italy, Mexico, the Netherlands, Portugal, Romania, Serbia, Sweden, Norway, and Switzerland.

[8] Steven Shapin has noticed that assistants and technicians were usually omitted from the iconography of experiments; see Steven Shapin, "The House of Experiment in Seventeenth-Century England," *Isis,* 1988, *79:*373–404.

[9] See Ferdinand Hoefer's entry on Lavoisier in *La nouvelle biographie générale* (Paris: Didot, 1851). See also G. Bruno's extremely popular textbook *Le tour de France par deux enfants* (Paris, 1877), pp. 290–291.

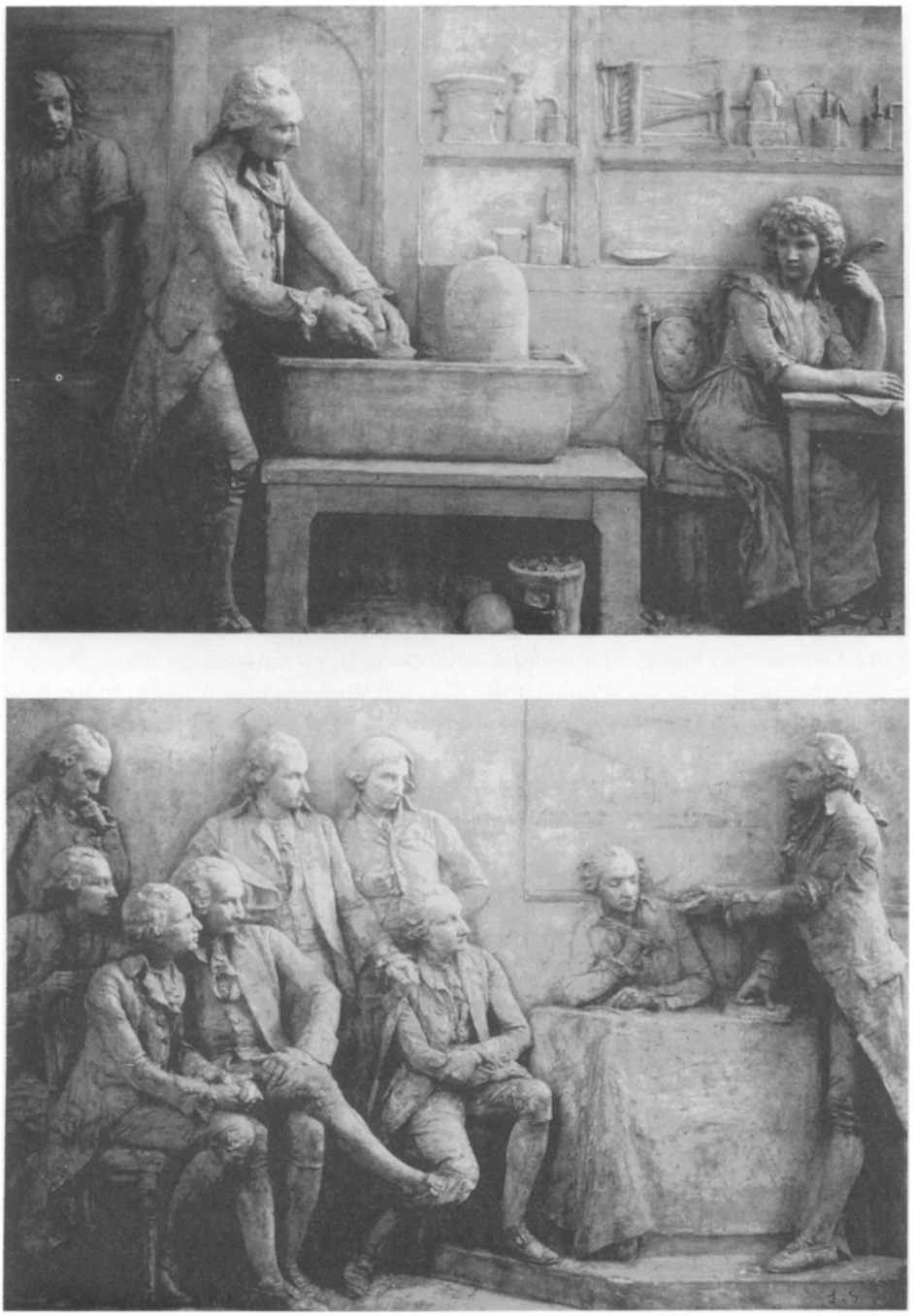

Figure 1. *Bas-reliefs placed beneath the statue of Lavoisier designed by Barrias. The monument, inaugurated in 1900, stood on the Place de la Madeleine in Paris; it was destroyed during World War II.*

monolithic and static set of clichés but, rather, as a complex set of representations emerging from tensions between local cultures, in this case between popular and academic cultures.

The situation is further complicated when we realize that the dignifying portrayal of Lavoisier as a member of the academy was not cultivated by the academy itself. A "notice historique" on Lavoisier was read by Berthelot, the permanent secretary, at a public session in December 1889, but this paper was not conceived as an academic eulogy. On the contrary, it was presented as a reappraisal of Lavoisier's achievements, involving a powerful critique of a number of historical misinterpretations. This lecture was based on a survey of Lavoisier's manuscripts, which had recently been deposited in the archives of the Academy of Sciences by the comte de Chazelles, Madame Lavoisier's heir. Berthelot was one of the first to read Lavoisier's manuscripts—together with Edouard Grimaux, a chemist teaching at the École Polytechnique who published the first full-length biography of Lavoisier in 1888.[10]

Did Berthelot act more as a historian or as the leader of the French chemical community concerned to shape its collective memory? There is no clear answer to this question. The address he gave to inaugurate the statue of Lavoisier on 27 July 1900 was certainly hagiographic, but not fawning in the manner of Jean-Baptiste Dumas's commemorative lecture delivered in 1836 at the Collège de France. In his volume *Lavoisier, la révolution chimique* Berthelot abandoned the conventional style of academic eulogy for a critical analysis of Lavoisier's method. He deconstructed the religious aura surrounding Lavoisier, denying for instance the infallibility alleged by Dumas, who claimed that nothing in Lavoisier's theory had since been modified. To the anonymous reviewer of the book in *Cosmos,* it seemed that Berthelot, in contrast to Grimaux, deliberately tarnished Lavoisier's glory. Unlike Dumas, who invoked Lavoisier as a model of the positivistic attitude prescribing the rejection of hypotheses, Berthelot did not seek to legitimate his own antiatomism through reference to Lavoisier's methodology. Berthelot held that Lavoisier certainly deserved to be called the founder of chemistry, but he was *only* a founder. He did not anticipate or even predetermine future developments in chemistry, as some chemists argued. But whereas Lavoisier was not held to personify the whole discipline of chemistry, it is clear from the title of Berthelot's book that he did embody the Chemical Revolution. Berthelot insisted that the Chemical Revolution was not a collective enterprise but the work of a solitary genius who, like Newton, superseded the accumulated work of many generations.[11]

Berthelot's glorification of the genius, which in fact reasserted Lavoisier's famous claim of ownership of the Chemical Revolution, must be contextualized in the climate of a long and violent controversy over Lavoisier's role that started in the midst of the Franco-Prussian War and continued until World War I. Berthelot's emphasis on Lavoisier's genius

[10] Marcelin Berthelot, "Notice historique sur Lavoisier"; rpt. with slight modification as the introduction to Berthelot, *Lavoisier, la révolution chimique* (Paris: Alcan, 1890). Berthelot had already carried out historiographical work on manuscripts, as can be seen from *Les origines de l'alchimie* (Paris: Steinheil, 1885). For the biography see Edouard Grimaux, *Lavoisier 1743–1794, d'après sa correspondance, ses manuscrits, ses papiers de famille et d'autres documents inédits* (1888; 2nd ed., 1896; rpt., Paris: Jacques Gabay, 1992).

[11] Marcellin Berthelot, "Discours d'inauguration du monument à Lavoisier par une souscription internationale," *Compt. Rend. Acad. Sci.,* 1900, *131*(5):305–315; Jean-Baptiste Dumas, *Leçons sur la philosophie chimique* (Paris, 1837; rpt., Brussels: Culture et Civilisation, 1972), p. 113; Berthelot, *Lavoisier, la révolution chimique,* pp. 53, 23; and "Lavoisier et son oeuvre: A propos d'un livre récent," *Cosmos,* 1890, no. 285, pp. 608–609. For a more detailed description of Dumas's lecture see Bernadette Bensaude-Vincent, "A Founder Myth in the History of Sciences? The Lavoisier Case," in *Functions and Uses of Disciplinary Histories,* ed. Loren Graham, Wolf Lepenies, and Peter Weingart (Dordrecht: Reidel, 1983), pp. 53–78.

can be seen as a response to repeated attacks on Lavoisier, which themselves were a reply to Adolphe Wurtz's provocative statement, published in 1868: "Chemistry is a French science: it was instituted by Lavoisier, of immortal memory. Over the centuries, it had been nothing but a collection of obscure recipes, often false, used by alchemists and later by iatrochemists. In vain, a great soul, G. E. Stahl, tried to give it a scientific basis at the beginning of the eighteenth century. His system was unable to withstand the test of the facts and Lavoisier's critical power."[12]

This opening sentence of the *Dictionnaire de chimie pure et appliquée* was perceived on the other side of the Rhine as a declaration of war; it prompted violent replies from German chemists. Although the German translator of the *Dictionnaire* tried to qualify Wurtz's words, Hermann Kolbe soon published a polemical article, "On the State of French Chemistry," arguing that Wurtz's remark simply betrayed his humiliated national pride and nostalgia for better times, prompted by the present Prussian superiority in chemistry. Jakob Vohlard contributed a detailed historiographical essay arguing that, compared with Carl Wilhelm Scheele and Joseph Priestley, Lavoisier was not a real chemist but, rather, an amateur. Concerning the antiphlogistic chemistry, Vohlard claimed that Lavoisier did not really dispense with phlogiston but merely denounced its hypothetical character.[13]

The chief result of Wurtz's attempt to designate a fatherland for chemistry was to focus German and French historiographical productions on a single question: Who is the founding father of chemistry, Stahl or Lavoisier? This does not mean that every history of chemistry published in this period was chauvinistic. In Germany, Hermann Kopp and Albert Ladenburg made every effort to distance themselves from Kolbe's and Volhard's positions. Significantly, Ladenburg, who had spent some time in Wurtz's laboratory as a student, responded to the debate by changing the title of his book so that it specifically named Lavoisier as the starting point of modern chemistry. However brilliant, these publications were exceptions and did not prevent French counterattacks. Nationalistic issues underlay most French histories of chemistry in the late nineteenth century. In 1891 Raoul Jagnaux published a detailed *History of Chemistry* that was openly inspired by a desire to conclude that chemistry was a French science. The French translation of Ladenburg's volume featured a preface by a French chemist, A. Colson, who complained that Ladenburg minimized the contribution of French organic chemists.[14]

These debates were contemporary with the professionalization of history in Germany

[12] C. Adolphe Wurtz, "Histoire des doctrines chimiques de Lavoisier," *Dictionnaire de chimie pure et appliquée,* 3 vols. (Paris: Hachette, 1869–1878), Vol. 1, p. 1.

[13] Hermann Kolbe, in *Journal für Praktische Chemie,* 1870, *110:*173–183; and Jakob Vohlard, "Die Begründung der Chemie durch Lavoisier," *ibid.,* pp. 1–47. See also Hélène Metzger, "Introduction à l'étude du rôle de Lavoisier dans l'histoire de la chimie," *Archeion,* 1932, *14:*31–50; Alan J. Rocke, *The Quiet Revolution: Hermann Kolbe and the Science of Organic Chemistry* (Berkeley: Univ. California Press, 1993), pp. 340–352; Rocke, "Between Two Stools: Kopp, Kolbe, and the History of Chemistry," *Bull. Hist. Chem.,* 1990, *7:*19–24; Rocke, "History and Science, History of Science: Adolphe Wurtz and the Renovation of the Academic Professions in France," *Ambix,* 1994, *14:*20–32; and Rocke and Emil Heuser, eds., *Justus Liebig und Hermann Kolbe in ihren Briefen, 1846–1884* (Mannheim: Bionomica, 1994).

[14] On Hermann Kopp's *Entwickelung der Chemie in der neueren Zeit* (Munich: Oldenburg, 1873) see Rocke, "Between Two Stools." Albert Ladenburg's *Vorträge über die Entwicklungs geschichte der Chemie in der letzen hundert Jahren* (1869) became *Vorträge über die Entwicklungs geschichte der Chemie von Lavoisier bis zur Gegenwart* in the second edition (1879). For the motivation behind Jagnaux's book see Raoul Jagnaux, *Histoire de la chimie,* 2 vols. (Paris: Librairie Polytechnique, 1891), Vol. 1, p. iii: "La chimie est donc dans ses grandes lignes, une science française. C'est pour le démontrer que le présent ouvrage a été écrit." For Colson's complaint see Ladenburg, *Histoire du développement de la chimie depuis Lavoisier jusqu'à nos jours* (Paris: Hermann, 1911).

and France.[15] Can we then contrast the chauvinistic collective memory of the chemists' community with more balanced and more objective views developed by historians? In fact, the chemist-historians were no more and no less objective than their fellow historians. The two groups contributed equally to the fight against the myths attached to the memory of Lavoisier. Berthelot stated explicitly that Lavoisier did not author the law of conservation of matter and that he was not the first chemist to introduce the balance into the laboratory. It was a professional historian of the French Revolution, James Guillaume, who debunked the myth of the revolutionary tribunal president's reply to Lavoisier's request for a delay of execution while he finished some experiments; Guillaume's close examination of the minutes of the tribunal showed that he never said "La république n'a pas besoin de savants [The Republic has no need of scientists]." Nevertheless, hasty conclusions opposing memory to objective history based on archival materials would be misleading. The historians who denounced the myths surrounding Lavoisier's death were obviously inspired by strong republican feelings and, like most of their colleagues, considered themselves Republicans.[16]

In fact, the controversy sparked by the chemist-historians flourished in the history departments of the universities of Berlin and Paris. In 1910 Max Speter defended a doctoral dissertation entitled "Lavoisier und seine Vorläufer: Eine historisch-kritische Studie [Lavoisier and His Precursors: A Historico-Critical Study]," which developed a fine analysis of the concept of the precursor in science and concluded that chemistry was already a scientific discipline before Lavoisier. The French scholar René Lote insisted that the so-called historicocritical methodology was nothing but a painstaking indictment against Lavoisier. His doctoral dissertation, "Les origines mystiques de la science allemande," defended at the Sorbonne in 1913, established a contrast between the German mystical tradition and French Cartesian and rationalistic science. In 1910 Wilhelm Ostwald's *Evolution of Chemistry* was translated into French. Only four pages were devoted to Lavoisier, presenting his work as the culmination of findings by Scheele, Priestley, and other forerunners and emphasizing inconsistencies in his system.[17] French readers were so inclined to perceive nationalistic prejudices that the French translator omitted the single sentence that expressed Ostwald's admiration for Lavoisier.

During World War I, when intellectuals on both sides of the Rhine were inclined to unleash hatred through manifestos and countermanifestos, Lavoisier again became a prime target. The French physical chemist Pierre Duhem published a brochure entitled *La chimie est-elle une science française?* [*Is Chemistry a French Science?*]. Duhem argued, against Ostwald, that Lavoisier had achieved a revolution in science, but he made it clear that he did not consider that work as the founding of chemistry. He criticized his fellow country-

[15] William R. Keylor, *Academy and Community: The Foundation of the French Historical Profession* (Cambridge, Mass.: Harvard Univ. Press, 1975); and Charles-Olivier Carbonnell, *Histoire et historiens: Une mutation idéologique des historiens français, 1865–1885* (Toulouse: Privat, 1976). On the chemist-historians' tradition see Colin A. Russell, " 'Rude and Disgraceful Beginnings': A View of History of Chemistry from the Nineteenth Century," *British Journal for the History of Science,* 1988, *21:*273–294; and Rachel Laudan, "Histories of the Sciences and Their Uses: A Review to 1913," *History of Science,* 1993, *31:*1–34.

[16] G. Pouchet, *Les sciences pendant la Terreur* (Paris, 1896); James Guillaume, "Un mot légendaire: 'La république n'a pas besoin de savants,' " *Révolution Française,* 1900, *39:*385–399, rpt. in *Etudes Révolutionnaires,* 1908, pp. 136–155; and Guillaume, "Lavoisier anti-clérical et révolutionnaire," *Révolution Française,* 1907, *26:*402–423, rpt. in *Etudes Révolutionnaires,* 1908, pp. 354–379. For a more recent discussion of this legend see Michelle Goupil and Alain Horeau, " 'La république n'a pas besoin de savants': Légende ou réalité?" *La Vie des Sciences,* 1990, *7:*231–236.

[17] Wilhelm Ostwald, *Leitlinien der Chemie* (Leipzig, 1906), trans. into French as *L'évolution d'une science: La chimie* (Paris: Flammarion, 1910).

men for overstating Lavoisier's contribution to chemistry and set himself up as an impartial judge of history. Duhem emphasized the significance of the phlogiston tradition that preceded Lavoisier, though he made an effort to minimize the German claims by arguing that Stahl's theory was made consistent thanks to the French chemist Gabriel-François Rouelle.[18]

To sum up: when contextualized in contemporary debates, the image of Lavoisier current at the centennial of his death seems remarkably moderate. There were very few commemorative events marking the anniversary. Presumably, the Republican scientific establishment did not want to revitalize the image of Lavoisier as a victim of the Terror. Far from reinforcing the image of Lavoisier as the founder of the whole of chemistry, such commemorations as there were provided an opportunity for a more professional historiography to attempt the revision of popular images deeply rooted in the collective memory. It did not, however, entail a complete revision of the narrative of Lavoisier's achievements. Access to new source materials and the more critical methods of a new historiography neither ended the controversy between German and French chemists nor deconstructed the myth of the founding hero.

II

In 1994 an official commemoration of Lavoisier's death was organized by the Academy of Sciences. Apparently, after the many debates raised on the occasion of the bicentennial of the French Revolution, the tragic end of Lavoisier on the guillotine was no longer a topic to be avoided.

Around the world, commemorative events were sponsored by scientific institutions such as academies and learned societies of chemists or physiologists. The motive for commemoration, however, varied according to the local culture. In the United States the Chemical Revolution—epitomized by the publication of the *Traité élémentaire de chimie*—was commemorated in 1989 with special issues of *Osiris* and the *Bulletin for the History of Chemistry*.[19] In other countries—France, Spain, Portugal, Italy, Switzerland, Belgium, and Mexico—it was not the hero of the Chemical Revolution who was honored but, rather, the victim of the French Revolution.

The style of the commemoration of Lavoisier might well reflect a specific feature of the chemical community, because there is a striking contrast in this respect with the 1995 program commemorating the centennial of Pasteur's death. Events celebrating Pasteur were organized all over the world, especially in the former colonial countries where Pasteur Institutes had been founded. "Science has no fatherland"—Pasteur's famous words—seem to have shaped his image: even in France, the opening ceremonies of the Pasteur celebration in early January took place not in a national institute like the French Academy of Sciences or the Academy of Medicine but at UNESCO. Even though Pasteur is particularly celebrated in France, he is honored not so much as a French scientist but as a "savant de l'humanité."

Lavoisier, by contrast, is still everywhere perceived as a French scientist. While it is no longer claimed that chemistry is a French science, Lavoisier remains a symbol of French national culture. In Portugal and Mexico, for instance, the Lavoisier celebrations were an integral part of a program for diffusing French culture.

[18] Pierre Duhem, *La chimie est-elle une science française?* (Paris, 1916), p. 5.

[19] Arthur Donovan, ed., *The Chemical Revolution: Essays and Reinterpretations, Osiris,* 2nd Ser., 1988, *4;* and *Bulletin for the History of Chemistry,* 1989, *5,* special issue.

The most striking feature of the Lavoisier bicentennial events is that the image of the founding father of chemistry is more vivid in 1994 than it was a century before. Whatever the recent historiographical developments, they have not fundamentally altered the portrayal of the founder.

In some cases, the image of the founder was no more than a rhetorical figure. The name of Lavoisier served as a rallying point, an excuse to raise funds and organize a meeting on modern science. Such were the annual meeting of the Société Française de Chimie and the Mexican conference "Lavoisier entre Europa y América: Las Ciencias Químicas y Biológicas 200 Años Después." In both cases, the reference to Lavoisier can be described as a strategic attempt to overcome the tensions and potential conflicts generated by the diversity of subdisciplines and subgroups, in order to recreate the unity of a discipline.

The name of the founder was also invoked as an instrument for teaching purposes. Lavoisier scholars were invited to encourage teachers in their attempts to introduce historical dimensions into chemistry teaching. Conferences of this sort were, in a sense, the most innovative. Although such audiences had no formal preoccupation with historical authenticity, they were receptive to new trends in historiographic research and ready to interact with professional historians. In some French schools named after Lavoisier, the commemoration was an opportunity to stimulate the creativity of pupils and teachers. Undaunted by the venerable figure of the academician-savant, eight-year-old schoolchildren in Châlon-sur-Marne had a lot of fun writing and performing a theater piece. Pupils of the Lycée Lavoisier in Paris also wrote a play, devised a quiz, and played various games pertaining to Lavoisier.[20]

The French Academy of Sciences went furthest in revitalizing the image of the founder. The four-day conference organized by the academy, held 3–6 May 1994, was a heterogeneous aggregate of canonical accounts of Lavoisier's work and career by professional chemists and historiographic views by a few professional historians. The opening ceremony took place under the cupola of the French Institute—the same building that, as the Collège Mazarin, was attended by the young Lavoisier—and the closing session was held at the Château de Blois; in between came visits to Lavoisier's properties in the Loir-et-Cher and valuable papers on Lavoisier in the context of local history. The first three lectures delivered under the cupola presented Lavoisier, in turn, as a revolutionary chemist, as the founder of the part of physiology called bioenergetics, and as the precursor of agricultural science and agricultural policy. In the fourth and final lecture, the vice president of the academy portrayed Lavoisier as the heir to Archimedes and Newton, the founder of the modern scientific experimental method. So fervent was the cult of the founding father that the president of the Lavoisier Committee suggested that, had Lavoisier survived the turmoil of the revolution and lived twenty-five more years, he would have developed the atomic theory and structural chemistry.[21]

The academicians who revitalized the cult of the founding hero were not ignorant of recent developments in the historiography of the Chemical Revolution. Some of them

[20] The meeting "Jornades d'Estudi de la Figura i Obra d'A. Lavoisier," held at the Universitat Autonoma de Barcelona, Centro d'Estudis Catalans, 25–26 May 1994, encouraged teachers to use historical materials in teaching chemistry. A play entitled "Vous avez dit Lavoisier?" was written and performed by the third-grade (CE2) pupils of the Lavoisier Primary School at Châlons-sur-Marne. The commemorative program of the Lycée Lavoisier in Paris included an exhibition put on by the pupils, a fifteen-minute video entitled "Regards sur Lavoisier," various talks on Lavoisier, demonstrations of Lavoisier's experiments on the decomposition of water, a quiz, a questionnaire, and a theatrical performance.

[21] Henri Kagan, "Lavoisier, chimiste," in *Il y a deux cents ans, Lavoisier* (Actes du Colloque, Paris–Blois, 3–6 May 1994) (Paris: Académie des Sciences, 1995), pp. 3–10, on p. 9.

reacted very strongly, as Lavoisier's self-appointed intellectual heirs, to historical interpretations that they considered to be "offensive" to the memory of their father. However, they cleverly used the recent biographies of Lavoisier to shape a new-look founder, more in tune with current science policy in France. To conclude a portrayal of Lavoisier that emphasized the close connection between basic and applied research and the interdisciplinary nature of his activities, Henri Kagan explicitly presented Lavoisier as a model for future generations. In a paper entitled "The Modernity of Lavoisier," the late Claude Fréjacques argued that Lavoisier was modern in that he was concerned with problems very similar to ours, such as public hygiene, the environment, military defense, and the management of agricultural and human resources. By emphasizing Lavoisier's varied and intense activities, the Academy of Sciences sought to portray him as an active, responsible, interdisciplinary civil servant. This picture is certainly congruent with the self-image the Academy of Sciences is promoting, that of a dynamic institution concerned with public welfare and supporting a humanistic view of science that transcends narrow specialties.[22]

The Pasteur centennial shows, however, that biologists went much further than chemists in the revision of the canonical image of the founding hero. That Bruno Latour's view of Pasteur as a clever tactician was sanctioned by the Pasteur Institute, which commissioned Latour to write the official album for the centennial, certainly reveals a radical change in the strategy of this institute. There was no scandal, at least in France, when Gerald Geison disclosed the "secrets" of Louis Pasteur's actual investigative practices, because the new cliché, spread through popular books and the popular press on the occasion of the centennial of his death, portrays Pasteur as an entrepreneur stimulated by careerism.[23] In contrast, the chemical community and the chemical industrial companies made no attempt to use the bicentennial commemoration of Lavoisier to support or legitimize new entrepreneurial science policies. Lavoisier remains a classic symbol of scientific progress achieved through a good balance between pure and applied research. Significantly, the statue of Lavoisier installed for the bicentennial, in the garden of the Maison de la Chimie in Paris, was sculpted by Ossip Zadkine forty years ago, at the request of the Société Chimique de France. This small Cubist figure, already out of fashion, hardly conveys a message of modernity (see Figure 2).

Mary Jo Nye has pointed out that historical mythologies and rituals can be viewed as elements shaping the identity of scientific disciplines.[24] Perhaps the contrast between the rather conservative commemoration of Lavoisier and the more innovative commemoration of Pasteur, as well as the contrast between the centennial and the bicentennial commemorations of Lavoisier, might tell us something about the current state of the discipline of chemistry.

[22] *Ibid.;* and Claude Fréjacques, "Modernité de Lavoisier," in *Il y a deux cents ans, Lavoisier,* pp. 29–34. On the academy's self-image see, e.g., Paul Germain, in *Vie Académique, Comptes-Rendus de l'Académie des Sciences,* 14 Dec. 1981, no. 293, pp. 129–151.

[23] See Bruno Latour, *Pasteur: Une science, un style, un siècle* (Paris: Perrin, 1994) (I am grateful to Jean Paul Gaudillière for calling my attention to this point); and Gerald Geison, *The Private Science of Louis Pasteur* (Princeton, N.J.: Princeton Univ. Press, 1995). While *Figaro*'s supplement on Pasteur (17 Jan. 1995) was inclined to reinforce the myth, *Le Monde* deliberately deconstructed it. See, e.g., Dominique Lecourt, "Louis Pasteur par delà l'image du bienfaiteur de l'humanité," and Roger Pol Droit, "L'institution Pasteur: Pour le centenaire de la mort du savant, livres et manifestations se multiplient: Pour quelles raisons le mythe du scientifique bienfaiteur de l'humanité est-il toujours aussi actif?" *Le Monde,* 24 Mar. 1995, pp. x–xi.

[24] Mary Jo Nye, *From Chemical Philosophy to Theoretical Chemistry: Dynamics of Matter and Dynamics of Disciplines, 1800–1950* (Berkeley: Univ. California Press, 1993), pp. 19–20.

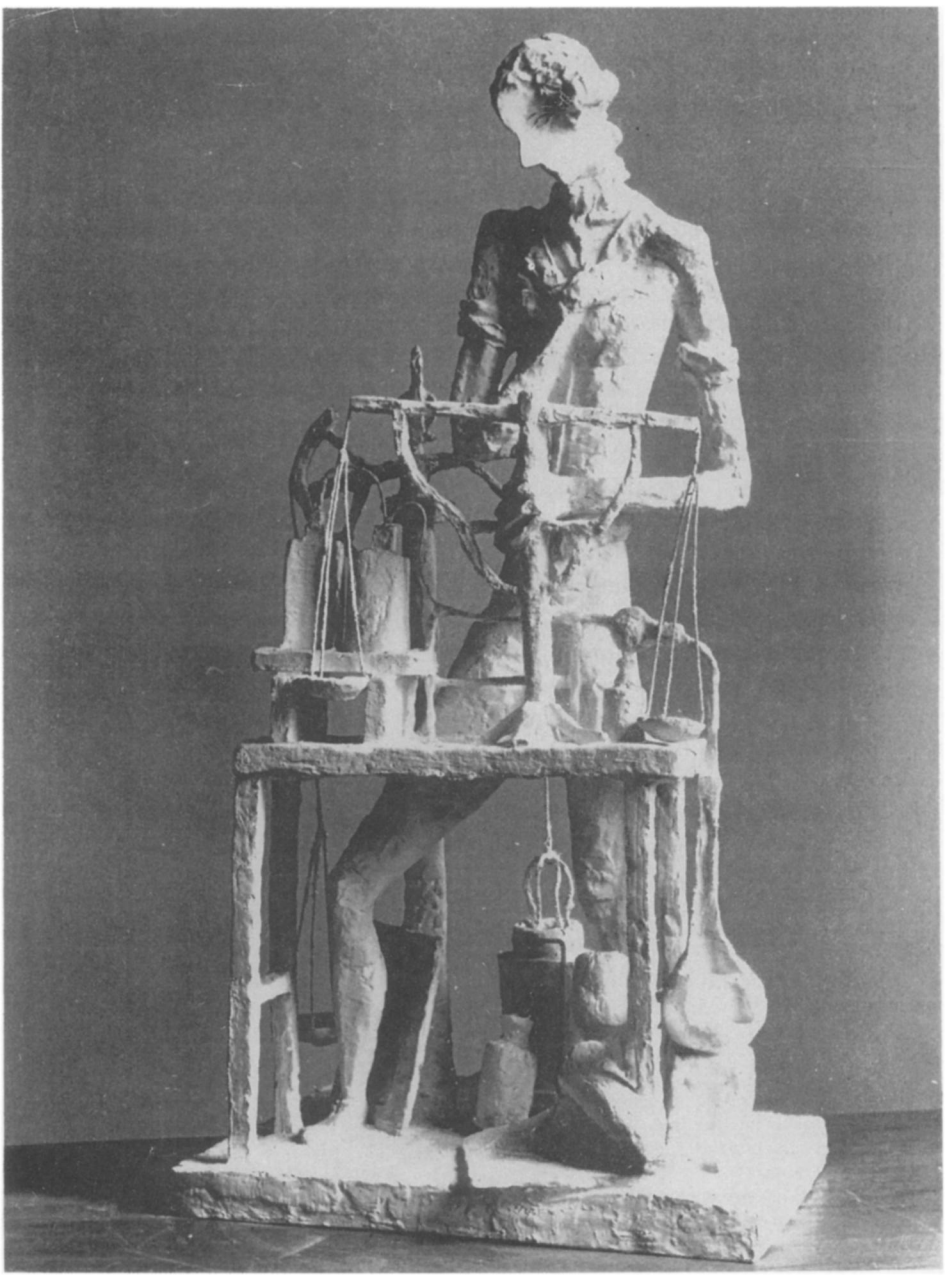

Figure 2. *The statue of Lavoisier sculpted by Ossip Zadkine forty years ago was installed in the garden of the Maison de la Chimie in Paris in May 1994 to commemorate the bicentennial of his death.*

III

What can we learn about the relationship between history and memory from this case study in scientific commemorations?

The centennial and bicentennial celebrations of Lavoisier confirm the view that scientific commemorations are ceremonies that help scientific communities enhance their social prestige. Although the chemical community was not able to recast the image of the founder in order to attract or mobilize recruits to chemical studies, the Lavoisier commemorations did help to reinforce or recreate the unity and identity of the discipline. It is also clear that the reference to a founding event allowed the chemical community to map or remap a specific space and a specific time for the discipline. Against the background of a common civil time, the chemists outlined their own "calendar" with a long period of prehistory, a Year Zero, and a modern disciplinary genealogy. These two features—rites of celebration and a specific calendar—invite us to consider commemorations as a kind of religious practice, belonging to the realm of tribal customs or mores, of rituals reenacting a mythical past rather than reconstructing the actual past.

However attractive such an anthropological perspective may seem, it gives a poor and oversimplified view of the status of scientific commemorations. As Pnina Abir-Am has stressed, scientists' commemorations are very much concerned with historical authenticity. The Lavoisier case suggests that the cult of the founder actually served to foster valuable historiographical studies on the Chemical Revolution in the late nineteenth century. The first historical narratives of the Chemical Revolution based on primary sources were written by working chemists who managed a compromise between two requirements: keeping alive the memory of the founder and criticizing historical distortions in order to write more accurate narratives of the founding events. It must be recognized that the current division of labor between historians and chemists may have disastrous effects on both sides. It encourages chemists in transmitting naive historical accounts and using scattered anecdotes to reconfirm their own identity. On the other hand, when reviewing the intense scholarship on Lavoisier occasioned by the bicentennial of the *Traité élémentaire,* the late Carleton E. Perrin ironically remarked that "the historiography of the Chemical Revolution has reached a state not unlike the crises associated with revolutions in science." Fragmented views and rivalries among alternative interpretations have prevented any consensus on a clear account of the Chemical Revolution. During the decades following Henry Guerlac's famous volume *Lavoisier—The Crucial Year,* many articles have claimed to disclose a new aspect of that revolution, to identify its "core," the nodal point that changed the face of chemistry.[25] They have undoubtedly enriched our knowledge of the Chemical Revolution. However, they have also encouraged scholastic debates among historians of science that have excluded working chemists, even those who have an interest in the history of their own discipline.

Given the persistence of the cult of the founder, it is extremely tempting for Lavoisier scholars simply to fight the distortions in the canonical accounts of the Chemical Revolution, to substitute a more correct narrative of the alleged founding events based on primary sources. From my own investigation of the Chemical Revolution, however, I have

[25] Pnina Abir-Am, "A Historical Ethnography of a Scientific Anniversary in Molecular Biology: The First Protein X-ray Photograph (1948, 1934)," *Social Epistemology,* 1992, *6:*323–354; Carleton E. Perrin, "Continuity and Divergence of Research Traditions: Lavoisier, Stahl, and Hales," *Osiris,* 2nd Ser., 1988, *4:*53–81, on p. 79; and Henry Guerlac, *Lavoisier—The Crucial Year* (Ithaca, N.Y.: Cornell Univ. Press, 1961).

learned how naive such a project would be. Reliance on primary sources does not allow historians to adopt the comfortable position of "myth exposer." Narratives based on a minute investigation of primary sources and manuscripts are more reliable than "memories," but this does not mean that they can reach "the actual past" because the events themselves were already shaped by accounts of what was going on. Participating in and writing narratives of the Chemical Revolution were one and the same process. When we consider the successive layers of interpretation of the Chemical Revolution that have accumulated over the past two centuries, it is clear that all the historiographical accounts have been heavily influenced by "memories," by the attitudes of those who defined themselves as disciples or heirs of Lavoisier.

Continuity or discontinuity? Revolution or foundation of chemistry? Revolution in chemistry or revolution into chemistry? Most of the issues that have oriented the historiography of the Chemical Revolution over the past decades were already subjects for debate among the actors at the time. It is well known that Lavoisier was very conscious of his role as a revolutionary: as early as 1773, he wrote in a laboratory notebook that the experiments he was planning to perform were "likely to bring about a revolution in physics and chemistry." Later, in 1792, he denied that the Chemical Revolution was the collective property of French chemists and claimed to be the sole author of the antiphlogistic doctrine.[26]

According to F. L. Holmes, the tendency to merge the notion of a revolution, a historical event within a discipline, and that of the foundation of modern science largely inspired by nationalistic motives is one of the major obstacles to a correct understanding of the Chemical Revolution. It must be stressed, however, that the "obstacle" was encouraged by Lavoisier himself, who conveyed the view of an *ex nihilo* foundation of chemistry in a number of memoirs published in the 1780s. The image of the founder could never have prospered without a collective amnesia among chemists. To forget past errors and prejudices, and learn chemistry directly from nature, was the guiding principle that Lavoisier borrowed from Étienne Bonnot de Condillac's empiricist philosophy. Condillac provided him with a number of arguments favoring the view that chemical knowledge should emerge from simple factual data. In stark contrast with most eighteenth-century textbooks, which gave lengthy descriptions of the past of their discipline, the *Traité élémentaire de chimie* omitted history, on the assumption that it would make a volume intended for beginners unnecessarily obscure: "It is not the history of science, or of the human mind, that we have to write in an elementary treatise: our only aim ought to be ease and perspicuity and with the utmost care we must keep everything out of view which might draw aside the attention of the student."[27]

Though he discarded historical material for pedagogical reasons, Lavoisier did not hesitate to burden his treatise with philosophical statements. Instead of the archaeology of collective knowledge, he proposed an individual genealogy of ideas, a notion borrowed

[26] Antoine-Laurent Lavoisier, laboratory notebook, 21 Feb. 1773, Archives de l'Académie des Sciences, quoted in Berthelot, *Lavoisier, la révolution chimique* (cit. n. 10), p. 48; and Lavoisier, *Oeuvres de Lavoisier,* ed. J.-B. Dumas and Edouard Grimaux, 6 vols. (Paris, 1862–1893), Vol. 2, p. 103. See also Evan N. Melhado, "Chemistry, Physics, and the Chemical Revolution," *Isis,* 1985, *76:*195–211; Arthur Donovan, "Lavoisier and the Origins of Modern Chemistry," *Osiris,* 2nd Ser., 1988, *4:*214–231; and Carleton E. Perrin, "Chemistry as Peer of Physics: A Response to Donovan and Melhado on Lavoisier," *Isis,* 1990, *81:*259–270.

[27] Antoine-Laurent Lavoisier, *Traité élémentaire de chimie,* in *Oeuvres,* ed. Dumas and Grimaux, Vol. 1, p. 10, trans. into English as *Elements of Chemistry,* trans. Robert Kerr (New York: Dover, 1965). See also Frederic L. Holmes, "The Boundaries of Lavoisier's Chemical Revolution," *Revue d'Histoire des Sciences,* 1995, *48:*9–47.

from Condillac's *La logique; ou, l'art de penser.*[28] Like a child forming increasingly complex ideas, he wrote, the chemist must start from simple factual data in order to build up notions of increasing complexity. The new chemistry could thus be considered the product of an individual mind instructed by factual data, and Lavoisier could easily be perceived as its solitary founding hero.

Lavoisier also developed other perspectives on his achievements and proposed different narratives of the Chemical Revolution. In a number of memoirs, in his correspondence, and even in Section 2 of the *Traité élémentaire,* he acknowledged his debts to past and contemporary chemists, and a hundred pages of his *Opuscules physiques et chimiques* was devoted to a review of the chemical studies of gases performed by others.[29] But the interpretation that ultimately prevailed was of a radical break with the past. That view might have been encouraged by the ethos of the Paris Academy of Sciences. According to the rules set out in the 1699 charter, each member of the academy had to produce new results and make significant contributions to the advancement of science. Toward the end of the eighteenth century, ambitious young academicians had so internalized this rule that they were prompt to claim any possible discoveries. This ethos was also reinforced by the publishing venture of the *Encyclopédie méthodique,* launched by the publisher Joseph Panckoucke, which presented scientists as experts in their research fields. The new "methodical" distribution of the *Encyclopédie,* with its various specialized dictionaries, undoubtedly stimulated a growing disciplinary consciousness; furthermore, the charge that contributors should review the changes accomplished since the time of Diderot's *Encyclopédie* encouraged the enthusiasm for revolutions in science. The result, which might jokingly be termed a "founding mania," was exemplified during the 1780s by at least three academicians: Lavoisier in chemistry, Charles-Augustin Coulomb in electricity and magnetism, and René-Just Haüy in crystallography. None of them made much mention of their colleagues or rivals, and all tended to pass over prior achievements so that their work would appear to be a fresh start. All these circumstances prompted the triumph—soon reinforced in the political domain by the French Revolution—of the modern meaning of the term *revolution* as a radical break over its astronomical meaning with reference to cyclic movement.[30]

The image of a radical new foundation for chemistry was reinforced by the reform of the chemical nomenclature. According to the authors of the *Méthode de nomenclature chimique,* that reform was intended to "improve" the language of chemistry, to discard the errors and prejudice that hindered the advancement of the science.[31] However, once the

[28] Étienne Bonnot de Condillac, *La logique; ou, les premiers développements de l'art de penser* (Paris, 1780; rpt., Paris: Vrin, 1980).

[29] Antoine-Laurent Lavoisier, *Opuscules physiques et chimiques,* in *Oeuvres,* ed. Dumas and Grimaux (cit. n. 26), Vol. 1, pp. 445–555.

[30] See I. Bernard Cohen, *Revolution in Science* (Cambridge, Mass.: Harvard Univ. Press, 1985); and Bensaude-Vincent, *Lavoisier, mémoires d'une révolution* (cit. n. 2), pp. 33–59. For more on the academy see Roger Hahn, *The Anatomy of a Scientific Institution: The Paris Academy of Sciences, 1666–1803* (Berkeley: Univ. California Press, 1971). The analogy between Lavoisier's, Haüy's, and Coulomb's styles has been pointed out by Christine Blondel in "La mécanisation de l'électricité: Idéal de mesures exactes et savoir-faire qualitatifs," in *Restaging Coulomb: Usages, controverses et réplications autour de la balance de torsion,* ed. Blondel and Matthias Dörries (Florence: Olschki, 1994), pp. 99–119. Coulomb went even further than Lavoisier: not only did he not mention the results of Cavendish's experiments, but he also referred to his law as "la loi fondamentale de l'électricité."

[31] Louis-Bernard Guyton de Morveau, "Sur les dénominations chymiques, la nécessité d'en perfectionner le système et les règles pour y parvenir," *Observations sur la Physique,* 1782, *19:*370–382; and Guyton de Morveau, Antoine-Laurent Lavoisier, Claude-Louis Berthollet, and Antoine-François de Fourcroy, *Méthode de nomenclature chimique* (Paris: Librairie Cuchet, 1787; rpt., Paris: Seuil, 1994).

new nomenclature, based on the antiphlogistic doctrine, was finally adopted and became widespread throughout Europe, chemists brought up two or three generations after the reform were no longer able to understand the treatises written before Lavoisier. One major result of the nomenclature reform was thus, in the long run, to deprive the chemical community of the memory of its past. Hence the persistent belief that before Lavoisier chemistry was a prescientific and obscure knowledge, shaped by rudimentary practices.

Along with amnesia, reminiscence played a key role in the early narratives of the Chemical Revolution. During heated debates, Lavoisier's supporters enriched the image of the founder hero with mythological references. Louis-Bernard Guyton de Morveau, initiator of the reform of chemical language, clearly suggested an *ex nihilo* creation of chemistry. As editor of the *Dictionnaire de chymie* for the *Encyclopédie méthodique,* he started writing the first entries in terms of phlogiston. When he came to Paris in 1787 he was converted to Lavoisier's antiphlogiston theory and became a staunch disciple eager to spread his new faith. In the middle of Volume 1 of the *Dictionnaire de chymie,* just before the entry "Air," he wrote a second foreword explaining why he had renounced the phlogiston theory and celebrating Lavoisier as a true savior. Lavoisier is compared to the "grand Descartes," a champion of truth, fighting against dogmatism and authority. Guyton reinforced the idea of foundation through his metaphorical use of the terminology of ancient cosmologies. Before Lavoisier confusion and darkness reigned over chemistry; after him there was light and a smooth road leading straight to truth. The order founded by the demiurge Lavoisier was immutable and eternal, for it was the order of nature itself:

> As soon as the hypothesis of a unique combustible substance was abandoned, we see everything return to the order which conforms to the nature of things. . . . Posterity will see the edifice raised for which they [the first chemists] could only put in place the first foundations; but she [posterity] will not consider destroying what they have done, except when, with the same substances, under the same conditions, nature ceases to bring about the same phenomena.[32]

Chemistry thus emerged from prehistory into history and immediately vanished into an immutable eternity. The mythical aura surrounding Lavoisier's achievements that emerged during his lifetime was enriched by the image of the sacrificial victim following his tragic death on the guillotine. It has often been remarked that Lavoisier's former disciples—Louis-Bernard Guyton de Morveau, Antoine-François de Fourcroy, Claude-Louis Berthollet, and Gaspard Monge—made no attempt to save him. However, it should be emphasized that a year later, after Thermidor, some of them were prompt to celebrate the victim of the Terror. Fourcroy organized a solemn ceremony commemorating Lavoisier at the Lycée des Arts and delivered a long funeral oration. In what seems an unavowed effort to clear himself from any suspicion of cooperating in Lavoisier's execution, Fourcroy revived Guyton's metaphor of the kingdom of light. But now the evil forces of darkness were not the phlogistonists but the agents of political power, a bloodthirsty, brutish beast that had dealt science an irretrievable loss.[33] Though the charges leading to Lavoisier's

[32] Louis-Bernard Guyton de Morveau, *Dictionnaire de chymie, Encyclopédie méthodique,* Vol. 1 (Paris, 1786), p. 628. Though the date 1786 appears on the front page of Vol. 1, the second section of this volume was actually published in 1789. See Denis I. Duveen and Herbert S. Klickstein, "A Letter from Guyton de Morveau to Macquart Relating to Lavoisier's Attack against the Phlogiston Theory (1778) with an Account of Morveau's Conversion to Lavoisier's Doctrine in 1787," *Osiris,* 1st Ser., 1956, *12:*342–367.

[33] Antoine-François de Fourcroy, "Notice sur la vie et les travaux de Lavoisier," read at the Lycée des Arts on Thermidor 15, Year 4 (2 Aug. 1796), manuscript, Archives de l'Académie des Sciences, File 1732. Fourcroy also developed a more historiographical account of the Chemical Revolution in Vol. 3 of the *Dictionnaire de chymie* of the *Encyclopédie méthodique,* in his entry "Chymie." See Janis Langins, "Fourcroy, historien de la révolution chimique," in *Lavoisier et la révolution chimique,* ed. Goupil (cit. n. 4), pp. 13–34.

execution were unrelated to his scientific achievements, Fourcroy portrayed him as a solitary genius who died a martyr in his unabated fight against error.

Fourcroy's eulogy also spread the story of the contemptuous dismissal of science by the president of the revolutionary tribunal that condemned Lavoisier. Although the attitude expressed by "La république n'a pas besoin de savants" is consistent with opinions held during this period, this quotation is apocryphal. Like most legends, however, this one has a deep meaning. The alleged reply remains vivid and emotionally charged in our collective memory, taking its place alongside the legend of Archimedes killed by an ignorant soldier or that of Galileo abjuring his heretical belief before a tribunal of the Inquisition. These stories are emblematic of the long-standing conflict between power and knowledge, between force and reason. In the case of Lavoisier, this message has been reinforced by another famous quotation concerning his death. Upon hearing of the execution of his colleague, Joseph-Louis Lagrange is said to have remarked: "It took them only an instant to cut off that head, but France may not produce another like it within a century." In emphasizing the contrast between the short-range actions on the political stage and the *longue durée* required for intellectual creation, Lavoisier's contemporaries encouraged a religious view of science, conveyed by the analogy of the division between temporal and spiritual powers. It is no surprise that in the early nineteenth century Auguste Comte, the French philosopher of science who initiated a new religion of humanity, became a staunch advocate of a political regime based on a clear separation, conceived in medieval times, of the two traditional powers.[34]

The earliest accounts of the Chemical Revolution—particularly Fourcroy's eulogy—were the main source of most nineteenth-century historical narratives. Later historians, oblivious to the polemical and political circumstances that prompted such accounts, took them at face value. While lurid allusions to the "brutish beast" of the Terror were rapidly discarded by dispassionate professional historians, they did not realize that the terms they used to describe the "actual past" (*revolution* and *foundation,* for instance) had also been prompted by the actors themselves—more precisely, by the actors who ended up as the winners in the construction of the new chemistry. Professional historians—like the scientists commemorating their ancestor—reenact the drama, although—unlike the scientists—they are unaware that it is a performance. The French term *re-présentation* encapsulates both activities, repeating the past and performing a play.

CONCLUSION

These critical comments on the historiographical tradition of the Chemical Revolution are not intended to convey skepticism about all attempts at reconstructing the process of historical change. Rather, in emphasizing that historical narratives combine memory, amnesia, and cultural reminiscence, I would like to invite a reassessment of the relation between history and memory.

As a first approximation, let us refer to a mythical story told by Socrates in the *Phaedrus.* The Egyptian god Thoth, the inventor of writing, went to visit Thamus, the king of Thebes,

[34] On the tribunal president's alleged remark see Goupil and Horeau, "'La république n'a pas besoin de savants'" (cit. n. 16); and Bensaude-Vincent, *Lavoisier, mémoires d'une révolution* (cit. n. 2), pp. 349–358. Lagrange's reported remark inspired a commemoration of Lavoisier by Stephen Jay Gould: "The Passion of Antoine Lavoisier," *Natural History,* June 1989, pp. 16–25. For Comte's views on separation of power see Auguste Comte, "Considérations sur le pouvoir spirituel" (1826), in *Ecrits de jeunesse, 1816–1828* (Paris: Mouton, 1970).

to urge that all Egyptians should be taught to benefit from his invention. Writing, he said, will provide them with more science and more memories, because in writing the lack of memory and the lack of science have found their "medicine." But the king of Thebes refused the offer. Your invention, he answered, will allow men to dispense with exercising their memories and consequently will encourage them to forget. Socrates goes on to argue that there is no possibility of real teaching through writing and reading. Through this mythical reference, the impact of writing stories—of historiography—is brought into question in a remarkable fashion. Is historiography an instrument for maintaining memory or a subtle way of killing it? The ancient Greek word *pharmakon*—meaning both medicine and poison—embodies the complexity of the issue.[35]

Is it possible, then, to oppose memory and history through the dichotomy between doxography and historiography introduced at the beginning of this essay? To the extent that they are both written traditions, they play ambiguous roles as auxiliary and obstacle to memory. Many attempts have been made to distinguish history from memory by using the criterion of reference to the past. Michel Foucault wrote: "History must be detached from the image that satisfied it for so long, and through which it found its anthropological justification: that of an age-old collective consciousness that made use of material documents to refresh its memory; history is the work expended on material documentation (books, texts, accounts, registers, acts, buildings, institutions, laws, techniques, objects, customs, etc.)."[36]

Foucault thus identified two different ways in which to deal with the "traces" of the past. They can be used to "refresh" the memory, to make it more vivid; such was, for Foucault, the traditional history that transformed the monuments of the past into documents, witnesses of the past. Alternatively, historians can choose traces, among a mass of documents attached to a society, that they then consider as monuments and try to decipher; such was, for Foucault, the new "archaeological" history. The contrast between the continuity of the collective memory and the discontinuity of history has been further elaborated by the French historian Jacques Le Goff in his attempt to characterize what he called the "révolution documentaire," that is, the use of the data base in history.[37] Both Foucault and Le Goff thus invite us to differentiate clearly between two attitudes toward the past, the first intended to memorize, the second to elaborate a specific "tableau."

I believe that the case I have considered in this essay supports the view of a tension between history and memory. Commemorative rituals and the correlative formation of a specific disciplinary calendar can be seen as mediators between memory and history, between the eternal present obtained through reminiscence or reenactment and the past reconstructed in writing historical narratives. Paul Ricoeur's notion of "representance" could be useful in describing their function. "Representance" or "lieutenance," Ricoeur argues, refers to "the relationships between historiographical reconstructions and their *vis-à-vis,* i.e., a past that is both abolished and preserved in its traces."[38] In connecting the time created by a vivid memory and the time generated through the graphical tradition, commemorations can be seen as a guarantee that the historiographical narrative is not a pure

[35] Plato, *Phaedrus,* 274c–275b. See also Jacques Derrida, "La pharmacie de Platon," in *La Dissémination* (Paris: Seuil, 1972).

[36] Michel Foucault, *The Archaeology of Knowledge,* trans. A. M. Sheridan Smith (New York: Pantheon, 1972), p. 7.

[37] Jacques Le Goff, "Documento/monumento," in *Enciclopedia Einaudi* (Turin: Einaudi), Vol. 5, pp. 42–45.

[38] Paul Ricoeur, *Temps et récit III* (Paris: Seuil, 1985), p. 183.

fiction. In other words, they act as a criterion for identifying the ontological reality of the past as reconstructed.

This may open up new historiographical perspectives on the events that have been labeled "foundations" of scientific disciplines. Allowing Clio, the goddess of history, to speak, the French writer Charles Péguy, at the beginning of this century, courted an inversion of our view of the past. To consider the fall of the Bastille as the first commemoration of this event—the first anniversary of the fall of the Bastille—is to admit a symmetry between the "call" of a generation to posterity for judgment and the "recalling" of the past by future generations that will never finish judging and rejudging. Inverting the traditional figure of the "tribunal of history," Péguy, as Clio's spokesman, concludes that it is impossible to exhaust the meaning of an event: "A revolution can be completed, but the history of this revolution will never be realized."[39] To finish the history of a completed event, eternity is needed, an infinity of time. The same view seems to me to be absolutely applicable to the notion of a founding event in science.

A central feature of such events, as illustrated by the Chemical Revolution, is that they immediately generate a great variety of narratives—sometimes accompanied by controversies. This variety of perspectives should not lead us to conclude that the Chemical Revolution (for example) has no objective reality. On the contrary, polysemy and flexibility can be regarded as the chief characteristics of founding events. For such events the metaphor of the founder of religion is only partially adequate, because it tends to freeze into just one meaning. Rather than a mythical gesture creating something out of nothing and predetermining the future, the foundation can be viewed as a set of events and circumstances that are important precisely because they offer an immense resource of meanings, because they are open to various reinterpretations and revisions.

While the traditional definition of history prescribed historians of science the purely deconstructionist task of fighting against myths and distorted memories, the new concept that I propose here invites them to undertake the more positive work of the hermeneutic reconstruction of historical realities by displaying the wide variety of their potential meanings.

[39] Péguy, "Clio" (cit. n. 1), p. 241.