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History Confronts Memory. Some reflections on Lavoisier's Centennial and Bicentennial [1]

The bicentennial of Lavoisier's death on May 8, 1794, has been celebrated with a great commemorative fervour in various countries. What are the meanings and purposes of such commemorative events.

Celebrations are rituals clearly intended to reinforce the collective memory of a scientific community. Their function is mainly to re-enact past events rather than reconstructing them or accounting for them. The significance of the celebration usually rests on the assumption of a founding father or a founding event of the discipline concerned. In the French chemical community Lavoisier still reigns as the uncontested father of modern chemistry and French pupils are still taught that the basic law of chemistry is "Rien ne se perd, rien ne se crée", and that this is Lavoisier's law. So strong remains the identification of Lavoisier with the discipline of chemistry, at least in France, that 1994 has been declared the "Year of Chemistry".

Because they belong to the realm of memory rather than real history, commemorations are not especially attractive to historians of science, usually more willing to revise than to repeat canonical accounts. Professional historians working on recent events acessible to individual memories often come into conflict with the actors and witnesses of the past events under study. Most often they easily distinguish their own historical, analytical approach, based on archives, from the oral collected memories. But what happens when the memories of the past have been "frozen", stabilized through written reports, transmitted from one generation to the following one? The term "doxography" traditionally used to name that kind

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of literature, strongly implies that it belongs to the realm of the "doxa", a low-level non-scientific, pseudo-knowledge that should be superseded by the "episteme", namely the scientific discourse provided by professional historians of science.

Using the Lavoisier case, through a rapid survey of the centennial and bicentennial celebrations of his death, I will try to question such clearcut distinctions between memory and history. I have been concerned with this issue when I became aware of a persistent gulf between the scholarly reappraisals of the chemical revolution centered around Lavoisier, and his public image among apprenctice and professional scientists. In spite of many attempts and efforts made by professional historians to emphasize the consistence of the prelavoisian chemistry and to spread more sophisticated interpretations of the chemical revolution among scientific milieux, most chemists remain clung to the image of the founding father. To all historians of science familiar with Lavoisier's works, it is clear that Lavoisier did not invent the socalled "Lavoisier's law", and did not even consider "Rien ne se crée" as a law. Over the past decades, the historiography of chemistry has been enriched by a number of studies emphasizing the disciplinary structure of chemistry, prior to the chemical revolution. In contrast to traditional views of eighteenth-century chemistry as an immature, dependent science, chemistry has been characterized as a well-established academic discipline, clearly distinguished from the chemical arts.[2] Evan Melhado advocates a clear distinction between the disciplinary formation of chemistry and the chemical revolution.[3] In highlighting investigations on the nature of salts by academic chemists, F. Lawrence Holmes has been led to describe the chemical revolution as a reconstruction of only one domain within a larger theoretical and practical framework.[4] And it must be stressed that the coherence and importance of eighteenth-century chemistry is not a recent discovery by professional historians that has not yet had sufficient time to diffuse. Its maturity was already assumed by Pierre Duhem as early as 1904 and the rationality of the phlogiston theory was emphasized by Emile Meyerson in 1921.[5] As early as 1915, Aldo Mieli portrayed Lavoisier as the acme of the pneumatic

[2] For instance, 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 University Press, 1980), pp. 389-418. CHRISTOF MEINEL, «Theory or Practice? The Eighteenth-Century Debate over the Scientific Status of Chemistry», *Ambix*, 1983, *30*, 68-103.

[3] EVAN M. MELHADO, «Metzger, Kuhn, and Disciplines», in *Studies on Héléne Metzger*, ed. Gad Freudenthal, (Leiden, New York, E.J. Brill, 1990) pp. 111-134. «Toward an Understanding of the Chemical revolution», *Knowledge and Society: Studies in the Sociology of Science Past and Present*, 1990, *8*, 123-37.

[4] FREDERIC L. HOLMES, *Eighteenth-Century Chemistry as an Investigative Enterprise* (Berkeley, University of California Press, 1989).

[5] P. DUHEM, *Le Mixte et la combinaison chimique*, Paris, 1904; second edition Paris, Fayard, 1985. EMILE MEYERSON, *De l'explication dans les sciences*, Paris, 1921, second edition Paris, Fayard, 1995.

chemistry, who rather completed the chemistry of his century than announced modern chemistry.[6] A similar view on the chemical revolution was later developed in Hélène Metger's works dating from the 1930s.[7] Nevertheless, these historiographical analyses did not alter the common image of Lavoisier as the founder of chemistry.

One might consider that the appropriate response of professional historians would be simply to fight against distorsions in "the" history of the chemical revolution, to use the opportunity of the bicentennial for substituting a more correct narrative of the "actual past".

Passing over the issue of whether the professional historian can reach the "actual past", I would like to stress that any such program would underrate the significance of the reconstructions of the past to scientific communities. Mythical portrayals of founding fathers of a scientific discipline are too frequent a phenomenon to be casually overlooked by professionnal historians. They are so deeply ingrained in scientific mentalities, that they can be analysed as some kind of "loci memori",[8] lieux de mémoire, which are integral part of a cultural history of science.

I

In 1890, the British magazine *Nature* noticed that Lavoisier was not honored by a statue in the city where he was born and where he died.[9] Although Berthelot's volume on Lavoisier can be considered as more relevant than a statue for commemorating a great savant, it was clear that Lavoisier's tragic end on the guillotine required more than that, a public gesture of repentance by the French Republic materialized in the stone of a monument. In fact, small statues of Lavoisier could already be seen in the city of Paris, one on the front wall of the Town Hall rebuilt in a neogothic style in 1882, and one in the main amphitheater of the Sorbonne renovated after a decree of 1880.[10] It is true, however, that no direct

[6] Aldo Mieli, «La posizione di Lavoisier nella storia della chimica», *Scientia*, XVII, 1915; French transl., «Le rôle de Lavoisier dans l'Histoire des sciences», *Archeion*, *14*, 1932, p. 51-56. On Aldo Mieli's interpretation of Lavoisier see Ferdinando Abbri, «L'opera di Lavoisier nell'interpretazione di Aldo Mieli», *Annali dell'instituto e museo di storia della scienza di Firenze*, VII, fascicolo 1, 1982, 71-82.

[7] Pierre Duhem, *Le Mixte et la combinaison chimique*, Paris, 1902, reprint Fayard, Paris, 1985); Hélène Metzger, *Newton, Stahl, Boerhave et la doctrine chimique*, Paris, 1930, reprint Blanchard, 1974; «Introduction à l'étude du rôle de Lavoisier dans l'histoire de la chimie», *Archeion*, *14*, (1932), p. 31-50; *La Philosophie de la matière chez Lavoisier*, Paris, Hermann, 1935.

[8] See Pierre Nora, *Lieux de mémoire*, Paris, Gallimard, 1984-1992, 4 vols.

[9] Quoted without reference in *Cosmos*, *16*, 1890, p. 408-409.

[10] On the main front wall of the Hôtel de Ville, Lavoisier is honored along with two famous Parisian writers Molière and Voltaire and another Parisian scientist who was politically comitted during the French revolution, Lazare Carnot. In the Sorbonne, Lavoisier is one among six figures

decision to honor Lavoisier — for instance, a symbolic transfer of his ashes to the Pantheon, like the recent decree concerning Pierre and Marie Curie — came from the French governement neither for the centennial nor for the bicentennial.

Finally in 1894, thanks to a subscription raised by the Academy of Sciences,[11] a monument was erected and inaugurated in 1900 on the occasion of the World Exhibition held in Paris. This monument designed by the French sculptor L.E. Barrias was located on Place de la Madeleine and has been destroyed in 1940 by the German troops of occupation. There was a statue of Lavoisier standing (people say that the sculptor used Condorcet and not Lavoisier as a model) with three or four bas-reliefs representing scenes of Lavoisier's life. From the pictures of the bas-reliefs, we can see that Lavoisier is portrayed at work and in a social context. One bas-relief represents Lavoisier in his private laboratory, performing an experiment with a pneumatic chest. He is assisted by his wife, sitting in a corner and apparently writing down what was going on in the laboratory notebook. A more unusual detail, is the portray of a technician or factotum carrying a heavy piece of material.[12] The second bas-relief represented Lavoisier reporting an experiment of calcination of lead before a host of colleagues from the Academy. The most striking feature of this monument is that it did not respond to the public image that popular science magazines, which flourished in nineteenth-century France, had forged. They used to portray Lavoisier as a lonely genius, working apart from the crowd. Like Copernicus or Galileo, he bravely fought the scientific establishment who was unable to understand his continuous and radical innovations.[13] Without suggesting that the monument was explicitly aimed at counteracting the image of Lavoisier forged by journalists and popular writers, 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 academcian and a "chef d'école". Such conflicting images show that scientific memory should not be viewed as a monolithic and static set of clichés but rather as complex set of representations emerging from tensions between local cultures, in that case between popular and academic cultures.

displayed on a crown all around the amphitheather, Robert de Sorbon 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.

[11] See an extract of the *Comptes-rendus de l'Acadèmie des sciences*, dated November 25, 1899, Archives de l'Académie des sciences, Lavoisier file N° 2.

[12] Steven Shapin noticed that assistants and technicians were most often omitted from the iconography of experiments «The House of experiment in seventeenth-century England», *Isis*, 79, 1988, p. 373-404; «Le technicien invisible», *La recherche*, 22 mars 1991, p. 324-333.

[13] See for instance G. Bruno's extremly popular textbook *Le Tour de France par deux enfants,* Paris, 1877, p. 290-291; Ferdinand Hoefer's entry on Lavoisier in *La Nouvelle Biographie générale* (Paris, Didot, 1851). More examples can be found in B. BENSAUDE-VINCENT, *Lavoisier, mémoires d'une révolution*, Paris, Flammarion, 1993, pp. 387-392.

The situation looks more complex when it is noticed that the dignifying portray of Lavoisier as a member of the Academy was not inspired by the Academy itself. This venerable state institution remained strangely silent for the centennial anniversary of Lavoisier's death. I found no traces of any commemorative ceremonies organized by the Academy in 1894. A "notice historique" on Lavoisier was read by Berthelot, who was the permanent secretary at a public session, in December 1889.[14] But this paper was not conceived as an academic eulogy. On the contrary, it was presented as a reappraisal of Lavoisier's achievements, based on a first survey of Lavoisier's manuscripts recently deposited at the Archives of the Academy of Sciences, with a firm criticism of a number of historical errors. In fact, Berthelot was one of the first who was able to read the Lavoisier's manuscripts, together with Edouard Grimaux, a chemist teaching at the Ecole Polytechique who published the first biography of Lavoisier in 1888. Berthelot had already carried historiographical work on manuscripts, as can be seen from his *Origines de l'alchimie* (1885).

Did he act more as an historian or as the leader of the French chemical community shaping its collective memory? There is no clear answer to this question. The tone is certainly hagiographic like Grimaux's biography, but not worshiping in the manner of Jean-Baptiste Dumas's commemorative lecture delivered in 1836, at the College de France.[15] Berthelot critized the religious *aura* surrounding Lavoisier, denying for instance his alleged infaillibility.[16] Unlike Dumas who invoked Lavoisier as a model of the positivistic attitude prescribing to reject hypotheses, Berthelot did not seek to legitimate his anti-atomism through a reference to Lavoisier's methodology. For Berthelot, Lavoisier certainly deserved the title of the founder of chemistry, but he was only a founder. He did not anticipate nor even predetermined the future developments of chemistry, as some chemists argued. Lavoisier did not personnify the whole discipline of chemistry, but it is clear from the title that he embodied the chemical revolution. Berthelot insisted that the chemical revolution was not a collective enterprise, but the work of a unique genius, who, like Newton superseded the work of many collective generations.[17]

Berthelot's glorification of the genius, which in fact reassessed Lavoisier's famous claim of ownership of the chemical revolution, has to be contextualized in

[14] MARCELIN BERTHELOT, «Notice historique sur Lavoisier», lue à la séance publique de l'Académie le 30 décembre 1889, *Le Moniteur scientifique, 35*, 1890, p. 125-145; reprinted with slight modification as an introduction to *Lavoisier, la révolution chimique*, (Paris, Alcan, 1890).

[15] JEAN BAPTISTE DUMAS, *Leçons sur la philosophie chimique*, (Paris, 1837, reprint Bruxelles, Culture et civilisation, 1972), p. 113. For a more detailed description of Dumas's lecture, B. BENSAUDE-VINCENT, «A founder myth in the History of Sciences? The Lavoisier case», in *Functions and Uses of Disciplinary Histories*, L. Graham, W. Lepenies, P. Weingart eds (Dordrecht, Reidel Publishing Company, 1983), p. 53-78.

[16] M. BERTHELOT, *Lavoisier, la révolution chimique*, (Paris, Alcan, 1890) p. 53.

[17] *Ibid.*, p. 23.

the climate of a long and violent controversy over the role of Lavoisier in the chemical revolution which started in the midst of the Franco-Prussian war and did not stop until World War I. Berthelot's emphasis on Lavoisier's genius can be seen as a response to repeated attacks against Lavoisier, which themselves were the reply to Adolphe Wurtz's provokative statement published in 1868: "La chimie est une science française: elle fut constituée par Lavoisier, d'immortelle mémoire. Pendant des siècles, elle n'avait été qu'un recueil de recettes obscures, souvent mensongères, à l'usage des alchimistes et plus tard des iatrochimistes. Vainement un grand esprit, G.E. Stahl, avait essayé, au commencement du XVIII[e] siècle, de lui donner une base scientifique. Son système ne put résister à l'épreuve des faits et à la puissance critique de Lavoisier".[18] This opening sentence of a *Dictionnaire de chimie pure et appliquée* was perceived as a declaration of war on the other side of the Rhine and prompted violent replies from German chemists. Although the German translator tried to qualify this statement, Hermann Kolbe soon published a polemical article "On the State of the French Chemistry" arguing that Wurtz's statement simply betrayed his humiliated national pride and nostalgia of the golden age, in view of the present Prussian superiority in chemistry.[19] Jakob Vohlard replied with a detailed historiographical essay arguing that, compared with Scheele and Priestley, Lavoisier was not a good chemist. Rather he was an amateur. Moreover, he did not really overthrow phlogiston but merely his hypothetic character.[20]

The chief result of Wurtz's attempt at ascribing a fatherland to chemistry, was to focus all German and French historiographical productions on chemistry one single question "who is the founding father of chemistry? Stahor Lavoisier?". It does not mean that all the histories of chemistry published in this period were chauvinistic. In Germany, Hermann Kopp and Albert Ladenburg made all efforts to remain apart from Kolbe's and Volhard's positions.[21] However brillant, these

[18] C. ADOLPHE WURTZ, «Histoire des doctrines chimiques de Lavoisier», in *Dictionnaire de chimie pure et appliquée*, 3 vols (Paris, Hachette, 1869-1878), t. I, p. 1.

[19] HERMANN KOLBE, *Journal für Praktische Chemie*, 1870, *110*, 173-183; see ALAN J. ROCKE, *The Quiet revolution. Hermann Kolbe and the Science of Organic Chemistry*, (Berkeley, University of California Press, 1993), p. 340-352; A.J. ROCKE and E. HEUSER eds, *Justus Liebig und Hermann Kolbe in iIhen Briefen*, 1846-1884, (Mannheim, Bionomica, 1994) forthcoming.

[20] J. VOHLARD, «Die Begründung der Chemie durch Lavoisier», *Journal für praktische Chemie*, 1870, *110*, 1-47. See also ALAN J. ROCKE, «Between two stools: Kopp, Kolbe, and the history of chemistry», *Bulletin for the History of Chemistry*, 7, 1990, 19-24; «Adolphe Wurtz as historian of chemistry», *Ambix*, 1994 ...

[21] HERMANN KOPP'S, *Entwickelung der Chemie in der Neueren Zeit*, (Munich, Oldenburg, 1873) see ALAN J. ROCKE, «Between two stools: Kopp, Kolbe, and the History of Chemistry», *Bulletin for the History of Chemistry*, 1990, 7, 19-24. ALBERT LADENBURG, *Vorträge über die Entwicklungs geschihte der Chemie in der letzen hundert Jahren* (1869), became *Vorträge über die Entwicklungs geschihte der Chemie von Lavoisier bis zur Gegenwart* in the 2nd edition issued in 1879. Significantly, Albert Ladenburg, who as a student had spent some time in Wurtz's laboratory,

exceptions did not prevent French counter strokes. In 1891, Raoul Jagnaux published a detailed *History of Chemistry*, openly inspired by a will to conclude that chemistry is a French science.[22] The French translation of Ladenburg's volume was prefaced by a French chemist, A. Colson, who complained that Ladenburg minimized the contribution of French organic chemists.[23]

All these debates were contemporary of the professionalisation of history in Germany and France.[24] Can we then contrast the chauvinistic collective memory of the chemists' community with the more balanced and more objective views developed by historians? In fact, the chemists historians were no more and no less objective than their fellow historians and equally contributed to deconstruct myths. Berthelot explicitly stated that Lavoisier did not author the law of conservation of matter; and that he was not the first chemist who introduced the balance in the laboratory. It was a professional historian of the French revolution, James Guillaume, who after a close examination of the minutes of the revolutionary Tribuna lestablished that the famous word "La république n'a pas besoin de savants" was a legend. Nevertheless, hasty conclusions opposing memory and objective history based on archive materials would be misleading. The historians who denounced the legend surrounding Lavoisier's death were obviously inspired by strong republican feelings and like most of their colleagues first considered themselves as Republicans.[25]

To sum up, when contextualized in contemporary debates, the centennial image of Lavoisier appears as remarkably moderate. On the one hand, there were strikingly very few commorative events of Lavoisier's death. Presumably, the Republican scientific establishment did not want to revitalize the image of Lavoisier as a victim of the Terror. On the other hand, far from reinforcing the image of Lavoisier as the founder of the whole of chemistry, the commemoration provided an opportunity to revise a number of clichés deeply rooted in the collective memory

changed the title of his book in response to the polemics between Kolbe and Wurtz, explicitly mentioning Lavoisier as the first modern chemist.

[22] «La chimie est donc dans ses grandes lignes, une science française. C'est pour le démontrer que le présent ouvrage a été écrit», R. JAGNAUX, *Histoire de la chimie* (Paris, Librairie polytechnique, 1891), 2 vols, I, p. iii.

[23] ALBERT LADENBURG, *Histoire du développement de la chimie depuis Lavoisier jusqu'à nos jours,* (Paris, Hermann, 1911).

[24] WILLIAM R. KEYLOR, *Academy and Community. The foundation of the French Historical Profession,* Cambridge, Harvard University Press, 1975; CHARLES-OLIVIER CARBONNELL, *Histoire et historiens. Une mutation idéologique des historiens français, 1865-1885*, Toulouse, Privat, 1976.

[25] POUCHET G., *Les sciences pendant la Terreur*, Paris, 1986; GUILLAUME J., «Un mot légendaire: La république n'a pas besoin de savants», *Révolution française, 39*, (1900), 385-99; reprint in *Etudes révolutionnaires*, 1908, 136-55; «Lavoisier anti-clérical et révolutionnaire», *Révolution française, 26*, (1907), 402-23, reprint in *Etudes révolutionnaires*, 1° série, Paris, 1908, 354-79. For a more recent account of this legend see GOUPIL M., HOREAU A. (1990), «La république n'a pas besoin de savants: Légende ou réalité?», *La Vie des Sciences, 7*, 231-36.

thanks to a more professional historiography. It did not, however, entail a complete revision of the narratives of Lavoisier's achievements. The access to new source materials and the more critical methods of a renewed historiography did neither close the controversy between German and French chemists nor deconstruct the mythical image of the founding hero.

II

In 1994, an official commemoration of Lavoisier's death has been organized by the Academy of science. Apparently, after so 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 that should be avoided.

The most striking feature of the Lavoisier bicentennial conferences is that the image of the founding father is more vivid in 1994 than a century before. Whatever the recent historiographical developpements, they did not alter the portray of the founder.

In a number of cases, the celebration of the founder was no more than a rhetorical figure.The name of Lavoisier was used as 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 America: Las ciencias quimicas y biologicas 200 anos despues". In both cases, the reference to Lavoisier can be described as a strategical attempt to overcome the tensions and potential conflicts generated by a diversity of subdisciplines and subgroups and recreating the unity of an institution.

The name of the founder was also used for teaching purposes. Lavoisier scholars were invited to encourage teachers in their attempt to introduce historical dimensions in chemistry teaching. These meetings were, in my view, the most innovative. The audience was receptive to new trends of historiographical research and, moreover, ready to interact with professional historians.[26] In some schools named after Lavoisier, the commemoration provided an opportunity to stimulate the creativity of pupils and teachers. Far from the venerable figure of the academician savant, eight-year-school children made a lot of fun in writing and performing a theatre play. Pupils of the lycée Lavoisier in Paris also wrote a play and invented a quizz and various play games around Lavoisier.[27]

[26] For instance the meeting held in Barcelona «Jornades d'estudi de la figura i obra d'A. Lavoisier», Universidade Autonoma de Barcelona, Centro d'Estudis catalans, 25-26 mai 1994.

[27] For instance the commemorative program of the Lycée Lavoisier in Paris included an exhibition realized by the pupils; a 15 mn video «Regards sur Lavoisier»; various talks on Lavoisier; the reproduction of Lavoisier's experiments of decomposition of water; a quizz questionnaire and a theatrical performance. Another theatre play entitled «Vous avez dit

It was the Académie des sciences who most revitalized the image of the founder. The four days Conference organized by the Académie in May 1994 was a strange aggregate of canonical accounts of Lavoisier's works and career by professional chemists and of historiographical views by a few professional historians. Four lectures delivered at the opening ceremony under the coupola of the Academie des Sciences successively presented Lavoisier as the founder of modern chemistry, as the founder of this part of physiology called bioenergetics, as the founder of agricultural science and to end up, as the heir of 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 assumed that, had Lavoisier survived the turmoil of the revolution for 25 more years, he would have developed the atomic theory, and structural chemistry.[28]

The chemists who revitalized the cult of the founding hero were not ignorant of the most recent developments in the historiography of the chemical revolution. Some of them reacted very strongly, as leaders of the chemists' folk, to the "offense" made to the memory of their father. However, the vice-Présient of the Academy, the late Claude Fréjacques cleverly used the recent biographies of Lavoisier to shape a new-look founder. In a paper entitled "The modernity of Lavoisier", he argued that Lavoisier was modern in the sense that he was concerned with problems very similar to ours, such as public hygien, environment, military defense, management of agricultural and human resources. In emphasizing Lavoisier's various and intense activities, the Académie des Sciences timidly renovated the image of Lavoisier and tried to make it more appealing to modern chemists. Portraying Lavoisier as an active, a responsible, and transdisciplinary civil servant is certainly congruent with the self-image that the Académie des sciences is seeking to promote as a dynamic institution, immerged in public affairs and concerned with public welfare.

However, the centennial of Pasteur celebrated in 1995 with great shows that biologists went much further than chemists in the revision of the canonical portrays of founding heroes. That Bruno Latour's portray of Pasteur as an entrepreneur, as a clever tactician became the official portray of the Pasteur Institute can certainly betray a radical change in the strategy of this Institute.[29] And a new cliché, largely spread through popular books and the popular press is a portray of Pasteur as a "carrierist" stimulated by a strong will of power; By contrast, the chemical community and the chemical industries were not ready to use the bicentennial commemoration of Lavoisier to support or legitimize new entrepreneurial science

Lavoisier?» was written and performed by the eight-year-old pupils of the Lavoisier primary school at Chalons-sur-Marne.

[28] HENRI KAGAN, «Lavoisier, chimiste», *Il y a deux cents ans, Lavoisier, Actes du colloque, Paris-Blois, 3-6 mai 1994*, Paris, Académie des sciences, 1995, p. 9.

[29] See BRUNO LATOUR, *Pasteur*, Librairie Académique Perrin, 1995. I am grateful to Jean Paul Gaudillière for calling my attention on this point.

policies. Lavoisier remains a classical symbol of scientific progress brought about by a good balance between pure and applied research.

Significantly, the statue which has been inaugurated for the bicentennial, in the garden of the Maison de la chimie in Paris, is an old statue sculpted by Ossip Zadkine (1890-1967) forty years ago, at the request of the Société chimique de France. This small cubist figure, already out of fashion will hardly carry a message of modernity

Without suggesting simplistic correlations, certainly the contrast between the rather conservative commemoration of Lavoisier and the more innovative commemoration of Pasteur as well as the similar contrast emphasized above between the centennial and the bicentennial commemorations of Lavoisier might tell something about the present state of the discipline of chemistry.

III

From this brief comparison of the centennial and bicentennial Lavoisier celebrations, what can be concluded concerning the opposition between history and memory?

The view that scientific commemorations are social rituals which help scientific communities to enhance their social prestige is certainly confirmed. Although in 1994, the chemical community was not able to recast the image of the founder so as to improve its public image and attract brilliant students into chemical studies, it was able to reinforce or recreate the unity and identity of a discipline beyond the subdisciplinary divisions and tensions. The commemorating events were also essential because through the reference to a founding event and a genealogy of heirs, chemists have mapped or remapped a specific space-time for the discipline, distinct from civil time.

In spite of the strong analogy with religious practices (specific calendar and commemorative rites), scientific commemorations are not independent from, nor indifferent to, historiographical accounts. They are very much concerned with historical authenticity.[30] The Lavoisier case suggests that the cult of the founder even fostered 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: maintaining alive the memory of the founder and criticizing historical distorsions in order to write more correct narratives of the fouding events.

30 See for instance Abir-Am P., «A historical ethnography of a scientific anniversary in molecular biology: the first protein X-ray photograph (1983, 1934)», *Social Espitemology, 6*, 1992, 323-354.

The most striking "lesson" delivered by the Lavoisier case is that reliance on primary sources does not allow historians to adopt the comfortable position of "myth-exposer". Coming back to Lavoisier's own collected works, it is clear that performing and writing narratives of the chemical revolution were one and the same process. The revolutionary events were already shaped by narratives of what was going on. Considering the successive layers of interpretation of the chemical revolution over the past two centuries, it is manifest that all 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 which have oriented the historiography of the chemical revolution over the past decades were already at stake among the actors of the chemical revolution. It is wellknown that Lavoisier was very conscious of his role as a revolutionary since, as early as 1773. Lavoisier went even further, in suggesting that he was founding chemistry as a science. It was not memory but rather amnesia who encouraged the move from the idea of revolution to that of foundation. To forget all the past errors and prejudices, and learn chemistry directly from nature was the guiding principle that Lavoisier borrowed from Condillac's empiricist philosophy. He might also have been encouraged by his colleagues Coulomb, Haüy who also frequently did not mention their colleagues or rivals and tended to eliminate prior achievements so that their work appeared as a fresh start.[31]

The image of a radical foundation has been reinforced by the reform of the chemical nomenclature. According to the authors of the *Méthode de nomenclature*, the reform was intended to "improve" the language of chemistry, to discard the errors and prejudice which hindered the advancement of science.[32] However, when the new nomenclature based on the antiphlogistic doctrine was finally adopted and widespread all around Europe, the chemists brought up two or three generations after the reform were no longer able to read or understand the treatises written before Lavoisier. On the long term, one main result of the reform of nomenclature was thus to deprive the chemical community of the memory of its past. Hence, the

[31] The analogy between Lavoisier's, Haüy 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 C. Blondel and Matthias Dörries eds., *Restaging Coulomb. Usages, controverses et réplications - autour de la balance de torsion*, Olschki, Florence, 1994 (forthcoming). Coulomb went even further than Lavoisier: not only he did not mention Cavendish's results of experiments, he also used to refer to his law as «la loi fondamentale de l'électricité».

[32] Louis Bernard Guyton de Morveau, «Sur les dénominations chymiques, la nécessité d'en perfectionner les sytème et les règles pour y parvenir», *Observations sur la Physique*, 1782, XIX:370-382; Louis-Bernard Guyton de Morveau, Antoine-Laurent Lavoisier, Claude-Louis Berthollet, Antoine de Fourcroy, *Méthode de nomenclature chimique* (Paris, Librairie Cuchet, 1787), reissued Paris, Seuil, 1994.

persistent belief that before Lavoisier chemistry was a prescientific and obscure knowledge, shaped by rudimentary practices.

Not only amnesia played a key-role in the first narratives of the chemical revolution but reminiscence as well. During the hot debates, Lavoisier's supporters enriched the image of the founder hero with mythological references to order out of chaos.Thus the mythical image of Lavoisier's achievements emerged during his lifetime and was later enriched by the additional dimension of a sacrifical victim, after his tragic death on the guillotine on May, 8, 1794.

It is thus manifest that the earliest accounts of the chemical revolution — like Fourcroy'eulogy, for instance, which has been the main source of all later nineteenth-century historical narratives — were a mixture of memory, of amnesia and of reminiscence. And later historians, oblivious of the polemical and political circumstances which prompted such narratives, took them at face value. Although the allusions to the "brutish beast of the Terror" have been rapidly discarded by the critical gaze of professional historians, they did not realize that the terms that they used to describe the "actual past" ("revolution" and "foundation" for instance) had been prompted by the actors themselves, more precisely by the actors who finally have been the winners. Professional historians — like scientists commemorating their ancestor — re-enact the drama, although — unlike scientists — they are unaware that it is a performance (French language says "une re-présentation du passé").

These critical comments on the historiographical tradition of the chemical revolution are not aimed at conveying any scepticism. Rather, in emphasizing that historical narratives are the result of a complex negotiation between memory, amnesia and cultural reminiscence, I would like to favor the view that the commemorative rituals and the correlative formation of disciplinary calendars can be seen as mediators between memory and history, between the eternal present obtained through reminiscence or re-enacting and the past reconstructed in writing historical narratives. In that view, the task of historians of science is les to descontruct myths and distorted memories, than to reconstruct historical realities by displaying the wide variety of their potential meanings.