

## Antoine Lavoisier

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Frederic Lawrence Holmes. *Antoine Lavoisier - The Next Crucial Year. Or, The Sources of His Quantitative Method in Chemistry*. Princeton: Princeton University Press. 1998. 184 p. ISBN 0-691-01687-9.

The book *Antoine Lavoisier - The Next Crucial Year* by Frederic Lawrence Holmes deals with just one single year in Lavoisier's scientific life, 1773. The book provides a thorough and detailed retrospect on the experimental work that constitutes the background of Lavoisier's first book *Opuscules physiques et chimiques* (physical and chemical essays) which was published in January 1774. Holmes thereby offers a reexamination of *Opuscules* which, because it has been regarded as Lavoisier's first move toward the chemical revolution, has appeared peculiarly hesitant and in lack of finished theories.

By means of Lavoisier's laboratory notebooks, Holmes is able to follow the great scientist closely day-by-day in his laboratory while he carried out the first experiments through which his quantitative method took shape. It is quite fascinating in this way to get to know the great scientist at work. Apparently, Lavoisier continuously changed direction in his laboratory work; if experiments did not work out as he had expected he put them aside for a while returning later to unsolved problems.

Again and again Lavoisier found it more difficult than he had expected to confirm experimentally the inferences he drew from his theoretical views. However, despite his experimental failures to support his theoretical views, Lavoisier boldly announced these new theoretical ideas before his older colleagues in the Académie des Sciences. Holmes' presentation of the private Lavoisier and his struggle to present his experimental results and theory as strongly as possible is quite entertaining. In addition, the book provides us with a more complete picture of the scientist than what can be obtained from his publications and public appearances alone.

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With prior knowledge of the results of Lavoisier's research during this crucial year one becomes completely captivated by Holmes' book. It is interesting to learn when Lavoisier first discovers that the keeping track of weights is more fundamental than of volumes, and the reader can hardly wait for Lavoisier to discover that the air given off during reduction processes is different from the residual air left after calcination processes.

Generally, Holmes, on the basis of this detailed, internalistic, or what he calls a fine-structure study of Lavoisier's scientific activities during the year 1773, is able to illuminate many aspects of Lavoisier and his science. As mentioned, a new understanding of *Opuscules* is offered. Holmes also shows that Lavoisier's characteristic balance sheet method emerged gradually during the year in question and was not caused by an admiration for quantitative methods in physics or elsewhere as has been declared by other Lavoisier scholars. In addition, we get a clear impression of the difficulties the eighteenth century chemist faced in the laboratory, and how he obtained experimental results which were far from always unambiguous.

As appears from the title of the book, it can be regarded as the next chapter in the story of Lavoisier's scientific life after Guerlac's [1961] which discusses the background of Lavoisier's realization of the role of gases in calcination and combustion processes and gives a thorough examination of the documents relevant in that connection. Although some knowledge about Lavoisier and the chemical revolution is required, it is not necessary to be familiar with Guerlac's book in order to benefit from the present work.

A large part of the book constitutes careful descriptions of Lavoisier's experiments and unless one is quite familiar with eighteenth-century terms for chemical substances and apparatus it is not easy to follow. A small appendix on eighteenth century chemical nomenclature is provided in the back of the book. However, Eklund's [1975] might be of great help as an additional work of reference.

By means of the present work Holmes intends to 'help sustain a stream of Lavoisier scholarship which has many miles still to flow' and I can only encourage Lavoisier scholars to continue in this direction. I certainly look forward to read about the crucial year 1774 in Lavoisier's scientific life.

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