

## Preface

In this second volume of the *Nuova Voltiana* enterprise we have collected five “chemical” papers.

We are grateful to our friends, historians of chemistry, for their co-ordinated efforts aimed at understanding and contextualising Volta’s chemical work. They have provided, we believe, significant new insights into several aspects of Volta’s pneumatic chemistry. New light is shed especially on the period 1776-1784, ranging from Volta’s initial intervention in the booming field of aerial chemistry to his reactions to the “discovery” of the synthesis of water. Rejecting the old simplistic picture of the evolution of eighteenth-century chemistry as an inevitable victory of the new antiphlogistic paradigm of Lavoisier over the previous antiquated phlogistic paradigm, all the authors proceed towards a more satisfactory image of both the chemical background and the specific role played by Volta. As we learn, in the period under review, no clear split occurred between a phlogistic and an antiphlogistic party. With the exception of Lavoisier and his entourage, all chemical researchers employed phlogistic schemes of such a variety as to escape any univocal paradigmatic definition. Our authors have thus undertaken the reasonable task left for the historian in a similar situation, namely a detailed investigation of Volta’s pneumatic chemistry within the complex experimental, conceptual and social diversifications of the phlogistic tradition. They have confirmed the preponderant influence of Priestley’s phlogistic pneumatics on Italian researchers and on Volta as a member of this scientific group. On the other hand, whenever the case, they have pointed out the elements of originality in Volta’s work, among which various deviations from Priestley and an independent convergence towards Lavoisier’s quantitative handling of chemical phenomena.

At least two important chemical issues have been left out. One is the long and difficult confrontation of Volta with Lavoisier’s antiphlogistic chemistry in the years after those here considered and his final reluctant acceptance of it. The other is Volta’s rejection of the chemical interpretation of the battery and his minor involvement in the chemical debates it raised. We hope that our understanding of Volta’s chemistry can be widened in the forthcoming volumes of *Nuova Voltiana* with contributions on these and other relevant topics.

FERDINANDO ABBRI identifies three different phases in Volta's chemical work, the first two based on phlogistic schemes, the third distinguished by a process of critical evaluation of Lavoisier's antiphlogistic chemistry. Leaving aside the latter, the author shows that Volta's first phase was strongly influenced by Priestley and especially by his schemes on the composition and the different modes of phlogistication of the various airs. Inspired especially by Kirwan's work on fixed air, in the second phase Volta loosened his allegiance to Priestley and proceeded along a more autonomous path.

BERNADETTE BENSUADE-VINCENT's paper is based on Volta's notes and additions to the Italian edition of Macquer's *Dictionnaire de chymie*. Exploiting this material as an observatory of pneumatic science in the early 1780s, she shows that it provides an interesting non-Lavoisier centred perspective on the process of emergence of pneumatic chemistry, a new research area which gave a decisive contribution towards the chemical revolution.

RAFFAELLA SELIGARDI addresses the problem of Volta's "missed discovery" of the synthesis of water. After tracing a picture of Volta's ideas on the composition of the various airs, she argues that the reason was mainly theoretical and related to the way in which he attributed the chemical and physical properties of gases to their different contents of phlogiston and heat and to the different modes of combination of these substances. In this context, the author investigates Volta's phlogistic and thermal models, highlighting in particular the double chemical and physical way in which he conceived the combinations of phlogiston and heat with matter.

MARCO BERETTA discusses eudiometry in the years 1775-1790 with an eye on the different theoretical and social factors which determined the evolution of this area. Attention is first focused on Landriani's programme for a medical application of eudiometry. The author then examines Volta's eudiometric programme, pointing out its different and more physical goals, among which especially an understanding of the processes of phlogistication of the various airs. In the case of Lavoisier, both a medical and a physical line are disclosed in his eudiometric tests, the first associated with his researches on respiration, the other with his studies on the chemistry of gases.

To overcome the insufficiencies of the old paradigmatic historiography, FREDERIC L. HOLMES undertakes a reconsideration of the mutual relationships between the chemical researches of Priestley, Lavoisier and Volta from the mid-1770s to the early 1780s. He draws attention to the absence of any clear polarisation between a phlogistic and an antiphlogistic camp and argues in favour of a nearly undivided recognition of Priestley as the leading figure in the field of pneumatic chemistry. The analogies and differences between the phlogistic elaborations of Priestley and Volta are finely displayed on the basis of extensive analysis of their writings. Particularly interesting are the similarities detected between Lavoisier and Volta in pursuing quantitative adequacy within their different conceptual frameworks.

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