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0521417759 - Enlightenment Science in the Romantic Era: The Chemistry of Berzelius and its Cultural Setting

Edited by Evan M. Melhado and Tore Frangsmyr

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Jacob Berzelius (1779–1848), one of the world's leading scientists in the first half of the nineteenth century, dominated the field of chemistry, animated the cultural life of his native Sweden, and served for three decades as Perpetual Secretary of the Royal Swedish Academy of Sciences. Despite his immense stature, modern studies of his life and work have been few and scattered, and older studies have underestimated his significance. *Enlightenment Science in the Romantic Era* remedies the scarcity of accessible, modern treatments of Berzelius by bringing to a broad audience the results of recent scholarship and offers an enhanced assessment of his originality and influence.

This volume sets Berzelius's work within the contemporary scientific and cultural context of both Sweden and Europe and suggests lines for further study. Its nine substantive chapters are framed by two very different biographical portraits that establish Berzelius's principal commitments (to the values of the Enlightenment), identify his Romantic opponents, explore his ability to garner and exploit scientific and cultural resources, and offer insights into his complex personality. Other chapters explore in detail his conflicts with Romanticism, his views of life and matter, and the substance of his chemistry. The Berzelius who emerges here is a more accessible, though more complicated, figure than customarily portrayed, and his achievements become more original and enduring.

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Berzelius at the height of his career, in 1843, was a member of 84 foreign and most Swedish scientific academies. Oil painting by Olof Södermark; in the Royal Swedish Academy of Sciences. © Kungl. Vetenskapsakademien. From the archives of the Royal Swedish Academy of Sciences, used with permission.

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**Enlightenment Science  
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The Chemistry of Berzelius  
and Its Cultural Setting

Edited by

**EVAN M. MELHADO**

*University of Illinois at Urbana-Champaign*

and

**TORE FRÄNGSMYR**

*Uppsala University*



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## ILLUSTRATIONS

This portrait has been called “the hungry Berzelius,” showing the young, poor, and ambitious student at Uppsala University.	<i>page</i> 10
Berzelius did not like the Romantic philosophers. From his travels in Germany in 1819 he made this drawing of a student in Tübingen. The reason for this “barbarian and shabby look” is to be found in that philosophical spirit that is called <i>Naturphilosophie</i> , he concluded.	23
In 1828 Berzelius and the Swedish Academy of Sciences had the opportunity to move to a bigger building, located in the center of Stockholm. As perpetual secretary, Berzelius had his headquarters here until his death in 1848.	105
Berzelius had a good sense of humor. This is a drawing of himself drinking champagne, when he received the Vasa Order from the king, Karl XIV Johan (Jean Baptiste Jules Bernadotte), King of Sweden and Norway.	223
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## CONTRIBUTORS

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CARL GUSTAF BERNHARD is Professor Emeritus of Physiology at the Karolinska Institute. He was President of the Royal Swedish Academy of Sciences from 1971 to 1973 and its Perpetual Secretary from 1973 to 1980. Bernhard has published many articles about Berzelius, as well as a book, *Through France with Berzelius: Live Scholars and Dead Volcanoes*, about his travels in France.

JOHN HEDLEY BROOKE is Senior Lecturer in History of Science at the University of Lancaster, where he has also been Senior Tutor and Principal of Bowland College. He has written extensively both on the history of organic chemistry and on the historical relations between science and religion. He is the author of *Science and Religion: Some Historical Perspectives* and since 1988 has been the editor of *The British Journal for the History of Science*.

GUNNAR ERIKSSON, Professor of History of Ideas and Learning at Uppsala University, has written on Linnaeus and the history of botany in Sweden, as well as on the Romantic science in Sweden. In *Kartläggarna* (1978), a Swedish-language monograph, he studied the relation between science and early industrialism in Sweden. A former editor of *Lychnos*, the Swedish yearbook for history of science, Eriksson is now studying Olof Rudbeck, a polyhistor and scientist in the generation before Linnaeus.

TORE FRÄNGSMYR is Research Professor in History of Science at Uppsala University. He has published several books, mostly about eighteenth- and nineteenth-century earth science. He is the editor of *Linnaeus, the Man and His Work* (1983), *Science in Sweden: The Royal Swedish Academy of Sciences, 1739–1989* (1989), and, with J. L. Heilbron and Robin E. Rider, *The Quantifying Spirit in the Eighteenth Century* (1990). Since



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1990 he has served as the Secretary General of the International Union of the History and Philosophy of Science.

SVEN-ERIC LIEDMAN has written books on Israel Hwasser, the antagonist of Berzelius (1971), and on Carl Adolph Agardh, another contemporary of Berzelius (1991). He has also written on Marx and Marxism, the natural philosophy of Friedrich Engels, and the origins of economics as a university discipline in Sweden. He is Professor of History of Ideas and Learning at Göteborg University.

STEN LINDROTH, who died in 1980, was Professor of History of Ideas and Learning at Uppsala University from 1957 until his death. His works include a three-volume history of the Royal Swedish Academy of Sciences (1967) and a four-volume study of the Swedish history of science (1975–1981).

ANDERS LUNDGREN wrote his dissertation on Berzelius and the atomic theory (1979), and has since published several articles on the history of chemistry. An Associate Professor of History of Science at Uppsala University, he is currently studying nineteenth-century Swedish biochemistry and pharmacy.

EVAN M. MELHADO, Associate Professor of History and Chemistry at the University of Illinois at Urbana-Champaign, is the author of *Jacob Berzelius: The Emergence of His Chemical System* (1979) and co-editor of *Money, Power, and Health Care* (1988). His research focuses on chemistry in the late eighteenth and early nineteenth centuries and health care policy in the twentieth century.

ALAN J. ROCKE is Associate Professor of History of Technology and Science at Case Western Reserve University in Cleveland, Ohio. Rocke writes especially on the development of chemistry in nineteenth-century Germany.

HANS-WERNER SCHÜTT is Professor of History of Exact Sciences and Technology at the Technical University of Berlin. He has written extensively on the history of physics and technology, and is the author of *Emil Wohlwill, 1835–1912* (1972), *The Discovery of Isomorphism* (1984), and *Eilhard Mitscherlich, 1794–1863* (1991). He is currently investigating the historical relationship of science, technology, and general world view.

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## PREFACE

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The chemist Jacob Berzelius (1779–1848) played a prominent role during his day. He animated the scientific scene in Sweden and served for three decades as the Perpetual Secretary of the Royal Swedish Academy of Sciences. At the same time, he was a leading figure within the international chemical community, traveling abroad a great deal and corresponding with colleagues the world over. However, within the history of science, he has not received attention commensurate with his stature. New studies are clearly needed to illuminate his achievements.

The idea for this book emerged some years ago, when Evan Melhado held an appointment as a guest researcher in the Office for History of Science at Uppsala University and began to collaborate with Tore Frängsmyr. We both found that historians interested in Berzelius were dispersed in many locations around the world, and we began to think of a way to bring them together to contribute to a collection of essays. Some of those we consulted agreed quickly, while others spent some time deliberating. Because both the editors and authors were located far from one another, communication was slow.

We are of course very gratified now that the book is at last ready. We wish to thank all the contributors for their cooperation and patience, and we want to acknowledge all the institutions that facilitated our work. Berzelius's manuscript collection is housed in the Center for History of Science at the Royal Swedish Academy of Sciences in Stockholm, where we benefited from excellent assistance. Economic support was graciously provided by The Bank of Sweden Tercentenary Foundation.

T.F. and E.M.M.

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## ABBREVIATIONS

- Berzelius, *ÅB* *Årsberättelse om Framstegen i Physik och Kemi till Kongl. Vetenskaps-Akademien af Jac. Berzelius, 1821–1840. 20 vols. (Stockholm, 1822–1841); continued as Årsberättelse om Framstegen i Kemi och Mineralogi afgiven af Jac. Berzelius, 1841–1847, 7 vols. (Stockholm, 1841–1848); cf. Berzelius, JB.*
- Berzelius, “Cause of Proportions” Berzelius, “Essay on the Cause of Chemical Proportions, and on Some Circumstances Relating to Them; Together with a Short and Easy Method of Expressing Them,” *Annals of Philosophy*, 1813, 2:443–454; 1814, 3:51–62, 93–106, 244–257, 353–364.
- Berzelius, *JB* *Jahresbericht über die Fortschritte der physischen Wissenschaften von Jacob Berzelius. Aus dem schwedischen übersetzt von C. G. Gmelin (for vols. 1–3) und F. Wöhler (for vols. 4–20). 20 vols. (Tübingen: 1822–1841); continued as Jahresbericht über die Fortschritte der Chemie und Mineralogie eingerichtet an die schwedische Akademie der Wissenschaften von Jacob Berzelius. 7 vols. tr. F. Wöhler (who is not mentioned on the title pages)*

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*Abbreviations*

	(Tübingen: 1842–1848); cf. Berzelius, <i>ÅB</i> .
<i>Bref</i>	Berzelius, <i>Jac. Berzelius Bref, utgifna af Kungl. Svenska Vetenskapsakademien genom H. G. Söderbaum</i> , 6 vols. suppl. (Stockholm and Uppsala, 1912–1935).
K. or Kungl.	Kungliga (Royal).
KVA	Kungl. Vetenskapsakademien (Royal Swedish Academy of Sciences).
KVA, <i>EA</i>	<i>Ekonomiska Annaler</i> , 8 vols. (Stockholm: KVA, 1807–1808).
<i>KVA, Handlingar</i>	<i>Kungl. Vetenskapsakademiens Handlingar</i> (Proceedings of the Royal Swedish Academy of Sciences).
LUB	Lund Universitetsbibliotek (Lund University Library).
Söderbaum, <i>Levnadsteckning</i>	H. G. Söderbaum, <i>Jac. Berzelius: Levnadsteckning</i> , 3 vols. (Uppsala: KVA, 1929–1931).
UUB	Uppsala Universitetsbibliotek (Uppsala University Library).