

# *Aurora Torealis*



*Studies in the History of Science and Ideas  
in Honor of Tore Frängsmyr*

MARCO BERETTA  
KARL GRANDIN  
SVANTE LINDQVIST  
*Editors*

SCIENCE HISTORY PUBLICATIONS/USA  
*a division of*  
Watson Publishing International LLC  
Sagamore Beach  
2008

First published in the United States of America  
by Science History Publications/USA  
a division of  
Watson Publishing International LLC  
P. O. Box 1240, Sagamore Beach, MA 02562

[www.shpusa.com](http://www.shpusa.com)

*“Fruit Nationalism: Horticulture in the United States—From the Revolution to the First Centennial”*  
© 2008 Daniel J. Kevles

© 2008 Watson Publishing International LLC

All rights reserved. This book may not be reproduced, in whole or in part, in any form (beyond the copying permitted by Sections 107 and 108 of the U.S. Copyright) without written permission from the author or publisher.

*This book has been produced thanks to the generous support of Lisbet Rausing;  
The Bank of Sweden Tercentenary Foundation;  
Sven och Dagmar Saléns Stiftelse; and the Nobel Foundation.*

#### *Library of Congress Cataloging-in-Publication Data*

Aurora Torealis : studies in the history of science and ideas in honor of Tore Frängsmyr /  
Marco Beretta, Karl Grandin, Svante Lindqvist, editors.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-88135-398-3 (alk. paper)

1. Science—History. 2. Science—Philosophy. I. Frängsmyr, Tore, 1938– II. Beretta,  
Marco. III. Grandin, Karl. IV. Lindqvist, Svante.

Q125.A83 2008

509—dc22

2008005311

Endpapers: Prints of auroras from *Voyages de la Commission scientifique du Nord en Scandinavie, en Laponie, au Spitzberg et aux Ferøe pendant les années 1838, 1839 et 1840 sur la corvette La Recherche, commandée par M. Fabvre* (Paris: A. Bertrand, 1842–45). These prints were given to J. J. Berzelius by Paul Gaimard 24 July 1844. (front cover): “Apparence de l’aurore boreale dans le sud à Bossekop (Finmark), le 19 Janvier 1839, à 7h 40m du soir”; (back cover): “Apparence de l’aurore boreale dans le nord-est à Bossekop (Finmark), le 16 Janvier 1839, à 10h 5m du soir”. Bossekop is Sami for Whale Creek and is located in the very north of Norway near the Alta River.

Designed and typeset by Publishers’ Design and Production Services, Inc.  
Sagamore Beach, Massachusetts. [www.pdps.com](http://www.pdps.com)

Manufactured in the U.S.A.



# Contents

*Preface* v

*Enlightenment in Antiquity?: Evolution and Progress in  
the Fifth Book of Lucretius' De rerum natura* 1

Marco Beretta

*Leonardo da Vinci's Concept of "Nature":  
"More Cruel Stepmother than Mother"* 13

Paolo Galluzzi

*How Torricelli Improved on Galileo's Laws of Free Fall  
and Projectile Motion* 31

William R. Shea and Tiziana Bascelli

*Solomon's Houses: Francesco Bianchini's  
Academic Places* 51

John L. Heilbron

*The Origin of Species from Linnaeus to Darwin* 71

Nicolaas Rupke

*The Natural Economy of Households:  
Charles Darwin's Account Books* 87

Janet Browne

- The Persistent Use and Abuse of Wilhelm von Humboldt  
in History and Politics—noch einmal* 111  
Thorsten Nybom
- Fruit Nationalism: Horticulture in the United States—  
From the Revolution to the First Centennial* 129  
Daniel J. Kevles
- Jules Verne—The Divided Modernist* 147  
Jean-François Battail
- Toward a History of Reason* 165  
Lorraine Daston
- Experience-Experiments: The Changing  
Experiential Basis of Physics* 181  
H. Otto Sibum
- Intermediate Theoretical Physics* 193  
Karl Grandin
- A Nobel Prize for Scientific Revolutions?:  
Hannes Alfvén and Conflicting Cosmologies* 215  
Svante Lindqvist
- Re-Reading Bernal: History of Science at the Crossroads  
in 20th-Century Britain* 235  
Mary Jo Nye
- History of Science in the Age of Policy* 259  
Sven Widmalm
- A Note on the “Integrity” of the University* 277  
Sheldon Rothblatt
- Old Books and E-Books* 299  
Robert Darnton
- Notes on Contributors* 305
- Index* 309



## Preface

The compass-needle points to the north. In 1747, the astronomer Anders Celsius of Uppsala University and his assistant Olof Hiorter showed the connection between the variations in the position of the compass-needle and the *Aurora Borealis*. Their findings were published in the Proceedings of the Royal Swedish Academy of Sciences; an academy founded by Linnaeus and others only a few years earlier. Celsius' and Hiorter's discovery is one of the earliest examples of Swedish science reaching out and influencing the international scientific community. An earlier example is the young Linnaeus's renowned journey in the north of Sweden in 1732; a journey which brought him laurels when he toured the continent in his *Lapland* dress in the 1730s.

Tore Frängsmyr—to whom this volume is dedicated on the occasion of his 70th birthday on July 8, 2008—has like Celsius and Linnaeus worked with both Uppsala University and the Royal Swedish Academy of Sciences as his institutional base. Like Celsius and Linnaeus in their days, he, too, has been instrumental in reaching out.

Tore Frängsmyr was appointed to a personal Chair in the History of Science in 1982 by the Swedish Research Council for the Humanities and Social Sciences (HSFR); a chair which was made permanent at Uppsala University in 1984. Since then, the development of the history of science and ideas in Sweden has benefited from the prolific and generous contributions by Tore. His impressive scholarly production has been coupled by his extraordinary successful attempt to renew and expand its institutional setting. The Office for History of Science at Uppsala University and the Center for History of Science at the Royal Swedish Academy of Sciences in Stockholm testify to the enduring significance of Tore's effort.<sup>1</sup> In his scholarly work he has focused on the sciences in 18th-century Enlightenment (to the

---

<sup>1</sup>Tore Frängsmyr, *Avdelningen för vetenskapshistoria 1982–2002*, *Salvia Småskrifter* No. 3 (Uppsala: Avdelningen för vetenskapshistoria, 2003); *idem*, *Vetenskapshistoria under 25 år 1982–2007*, *Salvia Småskrifter* No. 9 (Uppsala: Avdelningen för vetenskapshistoria, 2007). Cf. "Leaving His Chair after Twenty-five Years," *Uppsala Newsletter History of Science*, No. 37 (Spring 2006), pp. 1–2.

extent that he admits that such a thing ever existed). In 2000, Tore published his *magnum opus*, a two-volume work on Swedish history of science, ideas and learning, *Svensk idéhistoria: Bildning och vetenskap under tusen år*.

In the early 2000s, with an impressive scholarly career which few could match to his credit—and when a younger generation already had begun to go about tattling about his possible successor—Tore surprised them all. In 2002, he was appointed to a new chair: the Hans Rausing Chair in History of Science, a new personal chair at Uppsala University donated by the historian of science Dr. Lisbet Rausing in honor of her father. Tore's scholarly output has continued to grow since then, e.g. in 2006 he published his remarkable book on the Peking man, *Pekingmänniskan: En historia utan slut*.

The compass-needle points to the north when it comes to Tore's background in Västerbotten, a mythical province in *Ultima Thule* described by him in almost Rudbeckian terms. Many times have we heard him say of any well-known Swede "You know, it's very interesting. He [*or she*] comes from the same village as I do." To our minds, this village must have been a huge metropolis, the size of a major capital. Yes, it seems as if the higher echelons of Swedish academic, cultural, ecclesiastical, business and political life are saturated with childhood friends, neighbours and third cousins of Tore from this modest little hamlet in Västerbotten.

Tore loves, tongue in cheek, to exaggerate the harsh conditions of his northern background under the bleak Pole Star. Of this there is little when on December 10 each year he hands the Nobel medals and diplomas to the King during the Nobel Prize Award Ceremony; his Linnaeus medal jingling against the other medals on the chest of his formal attire; its lapels being embroidered with the Pole Star of the Royal Swedish Academy of Sciences.

The contributions to the history of science and ideas from antiquity to the present day published in this volume are offered as a tribute to an exceptional career, and as a gift to Tore Frängsmyr from his many friends in the international scholarly community of the history of science and ideas. The compass-needle does indeed point to the north, influenced as it is by *Aurora Toreal*s.

Firenze, Uppsala, and Stockholm  
Marco Beretta, Karl Grandin, and Svante Lindqvist