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*André-Marie
Ampère*

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CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
The Edinburgh Building, Cambridge CB2 2RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521562201

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First published 1995 by Blackwell Publishers Oxford
Reissued by Cambridge University Press 1996
This digitally printed first paperback version 2006

A catalogue record for this publication is available from the British Library

ISBN-13 978-0-521-56220-1 hardback
ISBN-10 0-521-56220-1 hardback

ISBN-13 978-0-521-56670-4 paperback
ISBN-10 0-521-56670-3 paperback

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In commemoration of
Edward Patrick McKenna
(1921–1992)

Contents

List of Illustrations	ix
General Editor's Preface	xi
Acknowledgements	xiv
Introduction	1
PART I Coming of Age (1775–1804)	5
1 Idyllic Youth	7
2 Marriage and Provincial Life (1800–1804)	24
PART II Paris (1804–1820)	97
3 Laplacian Physics	99
4 Ampère in Paris	123
5 Metaphysics: Ampère, Kant, and Maine de Biran	144
6 Mathematics, Chemistry, and Physics (1804–1820)	165
PART III Electrodynamics	225
7 Ampère's Response to the Discovery of Electromagnetism (1820)	227
8 Ampère's Electrodynamics (1821–1822)	265
9 Defense and Elaboration of the Theory	309

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[More information](#)

CONTENTS

PART IV Closing Years	351
10 The Final Synopsis	353
Notes	368
Bibliography	384
Index	400

Illustrations

1	Portrait of Ampère	12
2	Lavoisier's Table of Elements	190
3	Ampère's Table of Elements	209
4	Ampère's demonstration apparatus for electrodynamic forces between two parallel conductors	239
5	Ampère's angles for the mutual orientation of two current elements: α , β , and γ	241
6	One of Ampère's axially compensated helices	243
7	Ampère's apparatus for two conductors at variable orientations	245
8	Ampère's sketch of the apparatus to be discussed at the 26 December, 1820, Académie meeting	255
9	The final design for Ampère's first equilibrium apparatus	257
10	Ampère's induction apparatus	286
11	Ampère's initial rotation apparatus	294
12	Ampère's improved rotation apparatus (March, 1822)	295
13	Ampère's oscillatory apparatus (1822–1823)	296
14	Ampère's mobile rectangular conductor	298
15	Ampère's early drawing of the "third" equilibrium demonstration	301
16	Ampère's 1822 "third" equilibrium demonstration	304
17	Ampère's floating wire experiment	317

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Frontmatter
[More information](#)

ILLUSTRATIONS

- | | | |
|----|--|-----|
| 18 | Figure 1 from Ampère's 1824 memoir on electrodynamic phenomena | 329 |
| 19 | Figure 1 from Ampère's 1827 Brussels memoir | 334 |

General Editor's Preface

Our society depends upon science, and yet to many of us what scientists do is a mystery. The sciences are not just collections of facts but are ordered by theory, which is why Einstein could say that science was a free creation of the human mind. Though it is sometimes presented dispassionately and impersonally, science is a fully human activity, and the personalities of those who practice it are important in its progress and often interesting to us. Looking at the lives of scientists is a way of bringing science to life.

Those scientists who appear in this series have been chosen for their eminence, but the aim of the biographers is to place them in their context. The books are long enough for authors to write about the times as well as the life of their subjects. Science has not long been a profession, and for many eminent practitioners of the past it was very much a part-time activity: their lives will therefore show them practicing medicine or law, fighting wars, looking after estates or parishes, not simply focusing upon their hours in the laboratory. How somebody earned a living, made a career, got on with family and friends is an essential part of a biography, though in this series it is the subjects' commitment to science that has made them eligible and must be always at the back of the biographer's mind.

The name of André-Marie Ampère and his major field of work should be familiar to most people because the unit of electric current is named after him, but it might well be that we do not think of him even when we change a 3-amp fuse. Apart from that, very little is generally known

GENERAL EDITOR'S PREFACE

about him, especially in the English-speaking world, and this biography is therefore especially timely. James Hofmann has a fascinating story to tell, and he succeeds in bringing Ampère to life. It was not a very happy life: his father was executed in the French Revolution, his marriages were unhappy for different reasons, his son was a disappointment to him, and his last years were spent in poverty, doing university inspecting to make ends meet – he died during a tour of this duty. But he had had his times of intellectual triumph, which must have brought him great satisfaction.

An idyllic childhood and youth was violently brought to an end in the Terror in Lyon, destroying feelings of security. Then came happy marriage and provincial life, but the death of his wife in 1803 was a terrible blow. For serious work in science, it was at that time necessary to go to Paris, and there Ampère went to make his career. He was very interested in philosophy, particularly that of Immanuel Kant and Maine de Biran; and his work ranged across mathematics, chemistry, and physics. Chemists will recall his passing iodine to Humphry Davy, who speedily recognized it as an analogue of chlorine, and his independent postulation of what we call Avogadro's Hypothesis.

It was in 1820 that his big break came, when Hans-Christian Oersted's experiment proving the magnetic effects of electricity was repeated at the Académie des Sciences. Many others all over Europe took up this exciting research, but it was Ampère who became the founder of electrodynamics. Combining the French tradition of mathematical physics with great experimental skill, he made this a central part of physics in a very few years. Hofmann skillfully leads us through these researches, which mark Ampère out as one of the great scientists. They led, for example, to his election as a Foreign Member of the Royal Society of London in 1827.

Hofmann emphasizes that Ampère was never a representative figure, making a career as some of his contemporaries did. Prone to introspective brooding, and a devout Catholic, he kept up connections not only with Lyon but outside physical science. He was interested in the controversies over classification and evolution between Georges Cuvier and Geoffroy Saint-Hilaire, and had an encyclopedic urge to classify first the chemical elements, then the whole of knowledge. He sought a natural method, rather than an artificial system like that of Linnaeus, and his last and rather lonely years were spent in trying to perfect it.

The Ampère to whom Hofmann introduces us is thus primarily concerned with science, to which he made contributions of fundamental importance, but he also comes across as an individual full of quirks.

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GENERAL EDITOR'S PREFACE

He makes an excellent subject for a biography, working as he did in Paris when it was the world's centre of excellence in the sciences, so that his life and times were momentous. Hofmann shows how a good biography can be an excellent way into understanding the science of a past epoch, and also cast light on how the scientific mind, or scientific minds, work in a particular case. I warmly commend it.

David Knight
University of Durham

Acknowledgements

I have accrued enormous debts in writing this book. Over a decade ago, L. Pearce Williams of Cornell University graciously gave me access to his hard-won collection of Ampère microfilms and reprints. His generosity and advice greatly facilitated my own subsequent investigation of the voluminous Ampère archives. Invigorating conversations with Kenneth Caneva also were an important factor during that early period. More recently, Judith Grabiner has generously shared her knowledge of nineteenth-century mathematics. Nancy Caudill has worked wonders as the tireless Supervisor of the Interlibrary Loan Office at California State University in Fullerton. Archivist Christiane Demeulenaere-Douyere and her staff cheerfully helped me negotiate the Ampère archives at the Académie des Sciences in Paris. I am also grateful to the Académie for permission to photograph documents and to use some of them as illustrations. Financial support has been provided by a General Faculty Research Grant from California State University at Fullerton and by a Research Grant from the National Endowment for the Humanities, which I gratefully acknowledge. Portions of chapters 7, 8, and 9 are revisions of earlier publications in the *British Journal for the History of Science* and *Osiris*. Unless otherwise noted, all translations from French are my own.

James R. Hofmann
California State University
Fullerton, July 1994