

JESSICA RISKIN

Science
IN THE AGE OF
Sensibility

THE SENTIMENTAL
EMPIRICISTS OF THE
FRENCH
ENLIGHTENMENT

SCIENCE IN THE AGE OF SENSIBILITY

JESSICA RISKIN

Science
IN THE AGE OF
Sensibility



THE SENTIMENTAL
EMPIRICISTS OF THE
FRENCH
ENLIGHTENMENT

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO AND LONDON

JESSICA RISKIN is assistant professor in the Department of History at Stanford University.

The University of Chicago Press, Chicago 60637

The University of Chicago Press, Ltd., London

© 2002 by The University of Chicago

All rights reserved. Published 2002

Printed in the United States of America

11 10 09 08 07 06 05 04 03 02 1 2 3 4 5

ISBN: 0-226-72078-0 (cloth)

ISBN: 0-226-72079-9 (paper)

Library of Congress Cataloging-in-Publication Data

Riskin, Jessica.

Science in the age of sensibility : the sentimental empiricists of the French enlightenment / Jessica Riskin.

p. cm.

Includes bibliographical references and index.

ISBN 0-226-72078-0 (cloth : alk. paper)—ISBN 0-226-72079-9 (paper : alk. paper)

1. Science—France—History—18th century. 2. Enlightenment—France.
3. Sensitivity (Personality trait). I. Title.

Q127.F8 R57 2002

509.44'09'033—dc21

2002005793

©The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1992.

FOR MYRA JEHLLEN AND CARL RISKIN,
PARENTS, TEACHERS, FRIENDS

CONTENTS

List of Illustrations ix
Acknowledgments xi
List of Abbreviations xiii

ONE	<i>Introduction: Sensibility and Enlightenment Science</i>	1
TWO	<i>The Blind and the Mathematically Inclined</i>	19
THREE	<i>Poor Richard's Leyden Jar</i>	69
FOUR	<i>From Electricity to Economy</i>	105
FIVE	<i>The Lawyer and the Lightning Rod</i>	139
SIX	<i>The Mesmerism Investigation and the Crisis of Sensibilist Science</i>	189
SEVEN	<i>Languages of Science and Revolution</i>	227
EIGHT	<i>Conclusion: The Legacy of the Sentimental Empiricists</i>	283
	<i>Bibliography</i>	289
	<i>Index</i>	323

ILLUSTRATIONS

- 1.1. Frontispiece to Denis Diderot and Jean d'Alembert's *Encyclopédie, ou, Dictionnaire raisonné des sciences, des arts et des métiers* (1751–72) xvi
- 2.1. Portrait of Nicholas Saunderson (1682–1739), Lucasian Professor of Mathematics at the University of Cambridge 18
- 2.2 and 2.3. A cataract operation, from Robert James, *Dictionnaire universel de la médecine* (1746–48) 32
- 2.4. Plate from Noller's *Leçons de physique expérimentale*, 5th ed. (1759–66) representing a geometrical approach to vision 45
- 2.5. Jean-Baptiste Greuze's *L'Aveugle trompé* (1755) 55
- 2.6. Figure of a blind man seeing with sticks, from Diderot's *Lettre sur les aveugles* (1749) 57
- 2.7. Descartes's illustration of the analogy between vision and a blind man's use of canes, from Descartes, *La Dioptrique* (1637) 57
- 3.1. Illustration of the conservation of charge in a Leyden jar, from David Colden, "Remarks on the abbé Noller's Letters on Electricity" (1751) 68
- 3.2 and 3.3. Noller's effluences and affluences, as pictured in his *Essai sur l'électricité des corps*, 2nd ed. (1750) 78
- 3.4. Franklin's industrious cork ball, equalizing the charge on Leyden jar, from Franklin, *Experiments and Observations on Electricity* (1751) 88
- 4.1. Marguerite Gérard's 1779 etching *To the Genius of Franklin*, after Jean-Honoré Fragonard, with Turgot's epigram of Franklin beneath it 104
- 4.2. Anonymous Revolution-era engraving representing the peasantry crushed under the weight of the *taille*, the *corvée*, and other taxes 120
- 4.3. Revolution-era cartoon entitled "La Chute en Masse, Ainsi L'Étincelle Electrique de la Liberté, renversera tous les Trônes des Brigands Couronnés" 137
- 5.1. Depiction of a lightning conductor, from Beyer, *Aux amateurs de physique* (1809) 138
- 5.2. Pierre Roch Vignerot's portrait of Robespierre, after Adélaïde Labille-Guiard's 1790 painting 141
- 5.3. Lightning strikes the Campanile of San Marco, Venice, 23 April 1745. From Figuier, *Les Merveilles de la science* (1870) 152
- 5.4. Rioting in Saint-Omer over Vissery's lightning rod. From Figuier, *Les Merveilles de la science* (1870) 155

- 5.5. Lightning rod hat (1778), from Figuiet, *Les Merveilles de la science* (1870) 160
- 5.6. Lightning rod umbrella designed by Barbeau-Dubourg, from Figuiet, *Les Merveilles de la science* (1870) 161
- 5.7. The accidental death of Georg Wilhelm Richmann, from Figuiet, *Les Merveilles de la science* (1870) 165
- 5.8. First test of the power of points as applied to lightning, at Marly-la-Ville, 10 May 1752, from Figuiet, *Les Merveilles de la science* (1870) 167
- 6.1. Cartoon depicting the investigation of mesmerism, entitled *Le Magnétisme dévoilé* 188
- 6.2. A paralytic being cured by an electrical generator, from the abbé Sans, *Guérison de la paralysie* (1772) 197
- 6.3 and 6.4. Electrical amusements from the repertoire of William Watson, from his *Expériences et observations . . . [sur] l'électricité* (1748) 200
- 6.5 and 6.6. Scenes from Nollet's public lectures, from his *Leçons de physique expérimentale*, 5th ed. (1759), and *Essai sur l'électricité des corps*, 2nd ed. (1750) 202, 203
- 6.7 and 6.8. Scenes of mesmeric séances 204, 205
- 7.1. Table of correspondences between old and new chemical names, from Guyton de Morveau et al., *Méthode de nomenclature chimique* (1787) 226
- 7.2. Revolutionary-era engraving on the use of the new metric system 226
- 7.3. Jacques-Louis David's *Portrait de Monsieur Lavoisier et sa femme* (1788) 234
- 7.4. Joseph Wright of Derby's *Experiment on a Bird in the Airpump* (1768) 249
- 7.5. Emile and Jean-Jacques find their way home from the woods, illustration by Moreau le Jeune 255
- 7.6. Revolution-era cartoon caricaturing Jean-Sylvain Bailly 257
- 7.7. "A Revolutionary Committee under the Terror," anonymous engraving after Aléxandre-Evariste Fragonard 264
- 7.8. "The Arrest of Lavoisier," engraving by Jean Duplessi-Bertaux 265
- 7.9. Anonymous anti-Revolutionary engravings entitled *The Patriotic Calculator* 274
- 8.1. Sleeping Harvester representing Messidor (June–July) from the Revolutionary calendar 282

ACKNOWLEDGMENTS

This book's early stages were blessed by the mentoring of Roger Hahn, who taught a green graduate student the craft of history, and of Carla Hesse and Elisabeth Lloyd. John Heilbron's historical and stylistic voice, wisdom, and wit were my guides from the beginning. One of the great pleasures these paragraphs give me is an occasion for expressing my gratitude to him.

Many people offered vital help as the book unfolded: Alexi Assmus, Bernadette Bensaude-Vincent, Jed Buchwald, Carl Caldwell, Olivier Darrigol, Paula Findlen, Peter Galison, Charles Gillispie, Jan Golinski, Hazel Hahn, David Hollinger, Larry Holmes, Pierre Jacob, Evelyn Fox Keller, Daniel Kevles, Catherine Kudlick, the late Thomas Kuhn, Timothy Lenoir, Joseph Levine, Alan Marcus, Leo Marx, Sarah Maza, David Mindell, Timothy Moy, Katharine Norris, Alex Pang, Jean-Pierre Poirier, Jeffrey Ravel, François Recanati, Robert Richards, Carl Riskin, Margaret Schabas, Simon Schaffer, Sam Schweber, Stuart Strickland, Rebecca Ullrich, Lora Wildenthal, Pearce Williams, David Wilson, Elizabeth Wood, and Joseph Zizek. Emma Spary, as a reader for the University of Chicago Press, provided invaluable advice.

I owe a special debt of gratitude to Ken Alder, whom I thank with admiration for readings that have improved every part of this book, and have particularly helped to shape chapter 5. Myra Jehlen and Christopher Kutz too have read, and reread, the full text. The challenge of rethinking in light of these responses has been the hardest and best part of writing.

I have been continually grateful to Susan Abrams for the acumen and kindness with which she fostered my work and for her guidance into a field she has done so much to shape. I also thank the production team at the University of Chicago Press, particularly Erin DeWitt for her superb copyediting.

The editors of the Benjamin Franklin Papers at Yale University gave me full access to their materials, and an education in what was there and how to find it. My warm recognition goes especially to Ellen Cohn.

Richard Kim and Jehangir Malegam provided excellent research assistance.

Diana Wear performed an administrative coup to make such assistance available to me on the West Coast while I was still employed on the East. I thank Judy Spitzer, too, for her expert help.

I have been fortunate in receiving support for my research from the National Science Foundation, the Mellon Foundation, the Mabelle McLeod Lewis Foundation, the Doreen P. Townsend Center for the Humanities at the University of California at Berkeley, the History Department at Northwestern University, the Dibner Institute for the History of Science and Technology, the History of Science Department at Harvard University, and an Old Dominion Fellowship from the Massachusetts Institute of Technology.

Much earlier versions of some material in this book has appeared previously in *Historical Studies in the Physical and Biological Sciences* (parts of chapter 3), *Science in Context* (parts of chapter 5), and *Isis* (parts of chapter 7).

Finally, Sonia Jehlen has given unending support and encouragement, as have Naomi Allen, Steve Bloom, Alain Jehlen, Myra Jehlen, Pat Jehlen, Robert Kutz, Ruth Kutz, and Carl Riskin. In Christopher Kutz's intellectual companionship, I have had the benefit of his philosophical rigor and unerring eye for what is important. And Oliver Riskin Kutz arrived just in time to cheer the last pages.

ABBREVIATIONS

AGPC	Archives Générales de Pas-de-Calais, Arras
AN	Archives Nationales, Paris
AS	Académie des Sciences, Paris
BFP	Benjamin Franklin, <i>The Papers of Benjamin Franklin</i>
BIF	Bibliothèque de l'Institut de France, Paris
Coll. Bar.	Collection Barbier
FPA	Benjamin Franklin Papers Archives, Yale University
MAS	Académie des Sciences, <i>Mémoires de l'Académie des Sciences</i>


SCIENCE IN THE AGE OF SENSIBILITY



Figure 1.1. The frontispiece to Denis Diderot and Jean d'Alembert's *Encyclopédie, ou, Dictionnaire raisonné des sciences, des arts et des métiers* (1751–72). The engraving is by Benoît-Louis Prévost from a drawing by Nicolas Cochin-le-Fils. Diderot described the scene as follows: "We see on top Truth between Reason and Imagination; Reason is trying to snatch off her veil, Imagination is preparing to embellish her; below this group, a crowd of speculative philosophers; lower down, the troupe of artists. The philosophers have their eyes fixed on Truth; vain Metaphysics tries less to see her than to guess her. Theology turns her back to her, waiting for the light from on high." Diderot, *Salon* of 1765, in *Oeuvres complètes*, 10: 448. Courtesy of the Bancroft Library, University of California, Berkeley.

Chapter One

INTRODUCTION: SENSIBILITY AND ENLIGHTENMENT SCIENCE

 This book is about the sentimental youth of scientific empiricism, and about a time and place in which its dramas of self-definition were center stage: eighteenth-century France. Later, and for much of its four-century tenure at the heart of European culture, empiricism—the doctrine that natural knowledge originates in observation and experiment—came to have a hardnosed, unemotional reputation. Charles Dickens’s Mr. Gradgrind—implacably demanding “nothing but Facts, sir; nothing but Facts!”—was recognizable to readers of the popular weekly in which he appeared in 1854 as a caricature of the dispassionate empiricist. Behold Gradgrind: a “square wall of a forehead”; a mouth that was “wide, thin, and hard”; a voice “inflexible, dry, and dictatorial”; and an “obstinate carriage, square coat, square legs, square shoulders—nay, his very neckcloth [was] trained to take him by the throat with an unaccommodating grasp, like a stubborn fact.”¹ But scientific empiricism would not always have evoked Gradgrindian features. It appeared very different a century earlier to the philosophes who received the young doctrine from its seventeenth-century progenitors and were the guardians of its coming of age. To them, empirical knowledge was not a matter of impassive adherence to the hard facts of sensory experience, but rather one of sensibility.

“What is sensibility?” the playwright and philosophe Denis Diderot wrote to his friend Sophie Volland in 1760. “The vivid effect on our soul of an infinity of delicate observations.” Sensibility is defined in Diderot’s *Encyclopédie* as the capacity “to perceive impressions of external objects”; its first consequence, an answering “movement” of the sensible creature, is “sentiment.” Throughout this book I will use “sentiment” in this sense, to describe an emotional “movement” in response to a physical sensation. Sensibility was the “first germ of thought” and “the most beautiful, the most singular phenomenon of nature.” It attuned the animal to the world outside and governed its inner

1. Dickens, *Hard Times* (1854), chap. 1, 1–2.

processes—not only thought and emotion, but digestion, the secretions and excretions of the organs, the menstrual flux, and the functioning of the heart and lungs. In the more intimate setting of Diderot's letter to Mme. Volland, sensibility featured in some advice about the rearing of her young niece. He recommended that one be especially tolerant of small children. They were naturally "hard, even cruel" because experience had not yet developed their moral faculties. Moral sentiments arose from sensibility, the openness of the soul to vivid impressions of a delicate world.²

In contrast with the *Encyclopédie*, the *Dictionnaire de l'Académie française* (1694) had been matter-of-fact. It states plainly that sensibility was "that which has feeling. Stones are not sensible. The eye is a very sensible part." The *Dictionnaire* explains that "sensibility" can also be used "with regard to morals. This man is very delicate and sensible. He is sensible to the misfortunes of others."³ "Sensibility," therefore, had already signified both physical sensation and moral sensitivity. But this dual signification did not become significant until the middle of the eighteenth century. Diderot was among the first to recast the old definition into a new meaning. He used an axiom that John Locke had proposed in his *Essay concerning Human Understanding* (1690). The wellspring of Locke's sensationist epistemology, this axiom posited that the mind at birth was a blank slate, and that all its thoughts were inscribed upon it by the outside world, with the instruments of inscription being the body's five senses. Diderot and his contemporaries joyously embraced this axiom, extended it in all directions, and erected their cities of philosophical light upon it. Indeed, they expanded Locke's notion of the sensory origins of ideas by applying it to the emotions and moral sentiments as well. Ideas, emotions, and moral sentiments alike were expressions of sensibility, movements of the body's parts in response to sensory impressions of the outside world.

By fusing sensation with sentiment, the inventors of the notion of sensibility transformed the meaning of scientific empiricism, for if knowledge arose from physical sensation, it must now originate equally in emotion. French natural philosophers began around 1750 to talk, write, and argue about the sentimental origins of knowledge. Georges Buffon's *Histoire naturelle* (1749), the first volumes of the *Encyclopédie* (1750–51), Diderot's *De l'interprétation de la nature* (1753), and Etienne Bonnot de Condillac's *Traité des sensations* (1754) are all filled with counsel that is sentimental, not methodological. Rather than techniques of observation or systems of experimentation, these epistemologi-

2. Diderot to Sophie Volland, 11 November 1760, in Diderot, *Lettres à Sophie Volland*, 1:195; Anon., "Locke, philosophie de," in Diderot and d'Alembert, eds., *Encyclopédie* (1765), vol. 9; and Fouquet, "Sensibilité, Sentiment," in *ibid.*, vol. 15. Sophie Volland, whose given name was Louise-Henriette, was Diderot's lover during the 1760s and '70s. See Furbank, *Diderot* (1992), 186–90, 196–99, 202, 345.

3. *Dictionnaire de l'Académie française* (1694).

cal texts recommend emotional responses. One must not be “vain” or “frivolous” in building grand, rational systems and clinging to favorite hypotheses, but must follow one’s “instincts” and “let the thoughts flow.” (In the flowery, allegorical frontispiece to the *Encyclopédie* [fig. 1.1], arrogant Reason tries unsuccessfully to snatch away demure Truth’s veil.) The texts depict the sensory and emotional discovery of a world outside the self: the “intimate blossoming” of hope and fear, horror and humility, love and hate, “vivid desire.” Julien Offray de La Mettrie gave his *L’Homme-machine* (1748) a title that can mislead the modern ear: the human machinery he described was not cold but capable of all the passions. Sensibility marked the style as well as the content of these midcentury texts of natural philosophy. Diderot began his *Lettre sur les aveugles* (1749) with a poignant image of a blind man teaching his son to read.⁴

Over the following half-century, sensibility became crucial to ever more areas of scientific inquiry, beginning with physiology and psychology. During the 1760s the Swiss physiologist Charles Bonnet made sensibility the “great and the unique mobile” of animal life.⁵ Others made it the central feature of human nature. The polemical materialist Claude-Adrien Helvétius announced in two notorious tracts, *De l’esprit* (1758) and *De l’homme* (1773), that all operations of mind, all ideas, interests, and passions reduced to the “only quality essential to the nature of man,” that is, “physical sensibility.” The baron d’Holbach, a frequent contributor to the *Encyclopédie*, similarly wrote that “mind is a product of . . . physical sensibility” and that from “sensibility flow all the faculties that we call *intellectual*.”⁶ The moral sciences too became projects in sensibility, beginning with the baron de Montesquieu’s *De l’esprit des lois* (1748). Here he explained that laws must suit the “degrees of sensibility” of the people governed.⁷ And Jean-Jacques Rousseau, the doyen of sentimental moralists, advised in *Emile* (1762) that as long as a child’s “sensibility remains limited to his person there will be no morality in his actions.” Only after his sensibility extended beyond himself would Emile acquire “senti-

4. Diderot, *De l’interprétation de la nature* (1753), 175–85; Buffon, *Histoire naturelle* (1750), 3:124–26, 133, 142–45; Condillac, *Traité des sensations* (1754), parts I, II; Diderot, *Lettre sur les aveugles* (1749), 82. On sensibility in Buffon’s *Histoire naturelle*, La Mettrie’s *L’Homme-machine*, Diderot’s *Lettre sur les aveugles*, and Condillac’s *Traité des sensations*, see chapter 2. On Buffon’s sensibilities, see also chapter 3.

5. Bonnet, *Contemplation de la nature* (1764), part XI, 279. See also his *Essai de psychologie* (1754), *Considérations sur les corps organisés* (1762), and *La Palingénésie philosophique* (1769).

6. Helvétius, *De l’esprit* (1758), 2–7, 41, 324, 368; Helvétius, *De l’homme* (1773), 1:123–33, 2:60; Holbach, *Système de la nature* (1770), part I, 138; and Holbach, *Morale universelle* (1776), §1, 3. Diderot objected that sensibility was an essential property of matter, not a consequence of organization, and that it was therefore too primitive to explain animal and human capacities such as the capacity to feel pleasure and pain. He called sensibility a condition but not a cause of such capacities. See Diderot, *Réfutation d’Helvétius* (1774), 301, 310, 357.

7. Montesquieu, *Esprit des lois* (1748), bk. XIV, chap. 2, 192.

ments . . . of good and evil that constitute him a true man.”⁸ Moral learning, like natural philosophy, was a matter of fostering sensibilities.

Around the turn of the nineteenth century, Destutt de Tracy founded a new philosophical movement called *Idéologie*, the science of ideas. This new science studied the origins of ideas in sensibility and their combinations in the sentiments. Destutt de Tracy claimed that *Idéologie* underlay all the moral sciences: “grammar, logic, teaching, private morality, public morality (or the social art), education and legislation.”⁹ A fellow *Idéologue*, the philosopher and physiologist Pierre-Jean-Georges Cabanis, wrote that it was no longer possible to doubt that “physical sensibility is the source of all the ideas and all the habits that constitute the moral existence of man: Locke, Bonnet, Condillac, Helvétius, have carried this truth to the last degree of demonstration.”¹⁰ At the same time, the inventor of “biology,” Jean-Baptiste Lamarck, devoted much of his *Philosophie zoologique* (1809) to “physical and moral sensibility,” discussing their relations to “interior emotions” and the “interior sentiment” of one’s own existence.¹¹ During the first years of the nineteenth century, a narrowing philosophical focus sharpened the contours of sensibility, reducing it to a phenomenon of the nervous system and the basis of psychology.

By the beginning of the nineteenth century, then, sensibility had itself become a fully established object of scientific inquiry. This book, however, concludes around the time that development took place. I am interested in the preceding five decades, during which sensibility was only gradually becoming a scientific subject but was already fully in place as a scientific tradition. By “scientific tradition,” I mean a vocabulary and set of themes, and a repertoire of problems, methods, and principles, both tacit and explicit. As construed within the scientific tradition of sensibility, empiricism implied that knowledge grew not from sensory experience alone, but from a combination of sensation and sentiment. Therefore I propose to call this distinctive eighteenth-century mode of natural science “sentimental empiricism.”

It is important to identify the sentimental component of Enlightenment empiricism for several reasons. First, doing so can enable us to understand the eighteenth-century interaction between the natural sciences, on the one hand, and moral and political thought and practice, on the other. A central effect of sentimental empiricism was a corresponding intimacy between the natural sciences and the emerging moral sciences. These precursors of the modern social sciences were defined by one of their leading inventors, the marquis

8. Rousseau, *Emile* (1762), 501.

9. Destutt de Tracy, *Eléments d'idéologie* (1796), 151, 227.

10. Cabanis, *Rapports du physique* (1815), 72.

11. Lamarck, *Philosophie zoologique* (1809), see especially bk. II, part III, chaps. III, IV. Lamarck argued that sensibility was a product of the nervous system, so that animals lacking a nervous system were without sensibility.

de Condorcet, as sciences that studied “either the human mind in itself, or the relations of men to one another,” thereby joining epistemology and psychology with questions of proper behavior and good government. The moral sciences included political economy, civic education, and law.¹² A scientific, naturalizing approach to such moral subjects arose during the Age of Sensibility in unison with newly moralized natural sciences.

Both the naturalization of moral subjects and the moralization of natural subjects followed from a sentimental-empiricist understanding of thought and emotion. Sentimental empiricism, by tracing emotions to sensory experience, implied that moral sentiments might be subjected to empirical scrutiny and manipulation, which was the founding assumption of the moral sciences. However, by the same logic applied in reverse, sentimental empiricism also infused empirical experience, and therefore natural science, with sentiment and moral import. One of my principal interests in this study is to know how scientific and moral arguments interacted during a period in which the same people framed both sorts of argument and applied them to projects of political administration and activism. France in the half-century that led to the Revolution was a primary site for the genesis of moral sciences, whose descendants are our social sciences, and therefore also of the modern relations among scientific, moral, and social understanding and political application. I take the mutually transformative intimacy of natural and moral science to have been a defining feature of the Age of Sensibility, and this intimacy is a pivotal theme of the book.

A second reason for scrutinizing the sentimentalism of the empirical sciences during the Enlightenment is to show that these sciences were embedded within the contemporary culture, rather than acting upon it from outside. The “Age of Sensibility” has generally referred to developments in literature and the arts rather than in the sciences, and in particular to a moment in English cultural history defined by sentimental novelists such as Samuel Richardson and Laurence Sterne, who wrote during the period this book examines, from the middle of the eighteenth through the turn of the nineteenth century.¹³ In the study of English letters, the “Age of Sensibility” refers to a literary tradition characterized by a set of features that appeared both together and separately, and whose combination can seem incongruous in retrospect. The first was emotionalism, ranging in tone from pathetic to extravagant. The second was a preoccupation with the bodily mechanisms of experience and emotion.

12. Condorcet, “Eloge de Bucquet” (1780), in *Oeuvres*, 2: 410. See also Baker, *Condorcet* (1975), 197–98. On the eighteenth-century French origins of modern social science, see Baker, *Condorcet* (1975); Olson, *Emergence of the Social Sciences* (1993), chap. 9; and Manicas, *History and Philosophy of the Social Sciences* (1987), chap. 3.

13. On the Age of Sensibility in English literature, see Frye, “Towards Defining an Age of Sensibility” (1956); Bredvold, *Natural History of Sensibility* (1962); Hilles and Bloom, eds., *From Sen-*

And the third was a skeptical irreverence toward theories and institutions, including the same materialist, physiological theories of human nature that provided the backdrop for the first two features. Insofar as sciences such as physiology, medicine, and natural history, and scientific methods such as sensationist empiricism, have come into histories of sensibility, they have generally played the role of a source of technical information about sensibility—about the operation of the senses and their epistemological function—which artists and writers then transformed into their own artistic and literary notions of sensibility. Literary scholars and cultural historians have assumed that whereas sensibility was a florid style in literature and the arts, it was a plain object of research in the sciences.¹⁴ They have also taken for granted that the influence flowed from sober science to fanciful culture.¹⁵

Historians of science have traditionally also studied sensibility as an object of scientific inquiry. Their work has contained only passing hints that sensibility might also have constituted a style of science.¹⁶ Daniel Mornet ob-

sibility to Romanticism (1965); Birkhead, "Sentiment and Sensibility" (1925); Brissenden, *Virtue in Distress* (1974); Sambrook, *Eighteenth Century* (1986); Todd, *Sensibility* (1986); Mullan, *Sentiment and Sociability* (1988); Brown, *Preromanticism* (1991); Jones, *Radical Sensibility* (1993); Van Sant, *Eighteenth-Century Sensibility and the Novel* (1993); and Mullan, "Sentimental Novels," in *Cambridge Companion*, ed. Richetti (1996).

14. Walter Jackson Bate has traced "one of the major sources of the romantic stress on feeling" to "the mechanistic psychology of the seventeenth and eighteenth centuries." Bate, *From Classic to Romantic* (1961), 129–30. G. S. Rousseau has shown how theories of the functioning of the brain and nervous system informed the novels of sensibility and has argued, more generally, that one cannot understand the literary Age of Sensibility without reference to the history of physiology. Rousseau, "Nerves, Spirits, and Fibres" (1976) and "Discourses of the Nerve" (1989). On the origins of literary sensibility in natural philosophy, particularly physiology, see also Bredvold, *Natural History of Sensibility* (1962); Sambrook, *Eighteenth Century* (1986); Rodgers, "Sensibility, Sympathy, Benevolence" (1986); and Stephanson, "Richardson's 'Nerves'" (1988). Paul Ilie has made a parallel argument regarding the importance of physiology to the arts in the Age of Sensibility. Ilie, *Cognitive Discontinuities* (1995), 3. G. J. Barker-Benfield has identified a "gendered view of the nerves" as the "material basis" for the "culture of sensibility" of eighteenth-century Britain. Barker-Benfield, *Culture of Sensibility* (1992), vii. And John Brewer has similarly described English culture in the eighteenth century as having taken its shape by loosening the tight claims of scientific theories: "Sensibility and sentiment were technical terms employed in medicine, philosophy and psychology, but from the mid-eighteenth century they were widely and loosely used to describe the expression of heightened and intense human feelings, of a new sort of refinement." Brewer, *Pleasures of the Imagination* (1997), 113–14. On the scientific roots of literary sensibility, see also Todd, *Sensibility* (1986), 23–31.

15. Anne Vila, in her book on sensibility in medicine and literature, does define sensibility as "a joint literary and scientific tradition," in which literature and the sciences shared a reciprocal interaction. Vila, *Enlightenment and Pathology* (1998), 8. However, in her sections on sensibility in the sciences, she considers it rather as an object than as a style of investigation. Here I am suggesting that the sciences did not just provide technical accounts of sensibility that the arts drew upon to create a cultural style, but themselves participated in the style, and so were influenced by, as much as they influenced, the arts.

16. See, for example, Figlio, "Theories of Perception" (1975); Haigh, "Vitalism, the Soul, and Sensibility" (1976); Canguilhem, *La Formation du concept de réflexe* (1977).

served that “science and sentiment supported and explained one another,”¹⁷ but, as E. C. Spary has pointed out, Mornet separated his studies of science and sentiment into two separate works. Spary is one of a number of historians of eighteenth-century sciences who have begun to discern sentimentalism in their subjects. She argues that “‘science’ and ‘sentiment’ were not distinct” in French natural history and urges historians to recover the “links that existed . . . between taste and reason, connoisseurship and utility, sensibility and scientificity.”¹⁸ Michael Hagner makes a parallel argument regarding German physiology. He describes the way in which physiologists who argued for the epigenetic theory of embryology represented that theory as “an aesthetic view of nature” and emphasized the importance of an “inner feeling” and a “sensibility” on the part of the anatomist and physiologist as “the key to [their] . . . understanding of bodily processes.”¹⁹

But the role of sentiment in Enlightenment empiricism seems to me deeper and more pervasive. Sentimentalism was not confined to physiology, which made animal sensibility one of its objects of inquiry, nor to natural history, whose panoramic view and descriptive methodology gave sentiment easy access. Sensibility operated even in fields that studied the inanimate rather than the animate, and that took an experimental rather than a narrative view of nature.²⁰ Sentimentalism characterized the methods of what are now considered the hardest sciences, physics and chemistry. This book therefore seeks, using these hard cases, to show that sentimentalism was integral to the method of Enlightenment science as a whole. Empirical science then takes its place within the culture of sensibility, not only acting, but acted upon. If scientific theories and results were a crucial ingredient of sensibility, it is reciprocally the case that the ideals of sensibility were constitutive of those very theories and results.

I hope the phrase “Age of Sensibility,” which first calls to mind English sentimental novelists, though unexpected, will thus be persuasive as applied, in place of the more usual “Age of Reason,” to French science. The engagement of Enlightenment French science with sentimental English literature should not be surprising. Natural science and literature were not far apart

17. Mornet, *Le Sentiment de la nature* (1907), 456.

18. Spary, “The ‘Nature’ of Enlightenment” (1999), 299. See also Spary, *Utopia’s Garden* (2000), chap. 5, which discusses the role of sensibility in natural history. Spary writes, “The power to sense, *sensibilité*, was central to the making of natural historical knowledge at the Jardin in the second half of the century” (196). On “the rise of an intensified ‘feeling for nature’” in “later-eighteenth-century France,” see Charlton, *New Images of the Natural* (1984).

19. Hagner, “Enlightened Monsters” (1999), 198–99.

20. Cf. Spary, *Utopia’s Garden* (2000), 6: “While experimentalists of the eighteenth century often portrayed nature as artful, coquettish, modestly covering her innermost secrets, naturalists proudly announced they perceived nature in herself, through a relationship of unmediated sensibility.”

sample content of Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment

- [*Lincoln and the Jews: A History.pdf, azw \(kindle\), epub*](#)
- [**read The Cambridge History of Seventeenth-Century Music \(The Cambridge History of Music.pdf, azw \(kindle\), epub**](#)
- [read Prophecy Of The Female Warrior \(The Nephilim Warrior Series, Book 1\) .pdf, azw \(kindle\), epub](#)
- [read online All About Eva .pdf, azw \(kindle\), epub](#)
- [download online Debt-Proof Your Christmas: Celebrating the Holidays without Breaking the Bank](#)
- [The Prose Edda: Norse Mythology for free](#)

- <http://fortune-touko.com/library/The-Apex-Book-of-World-SF--Volume-1.pdf>
- <http://growingsomeroots.com/ebooks/Mouthwatering-Vegan--Over-130-Irresistible-Recipes-for-Everyone.pdf>
- <http://conexdx.com/library/HCI-Beyond-the-GUI--Design-for-Haptic--Speech--Olfactory--and-Other-Nontraditional-Interfaces--Interactive-Tech>
- <http://jaythebody.com/freebooks/The-Cell--A-Very-Short-Introduction--Very-Short-Introductions-.pdf>
- <http://test.markblaustein.com/library/Debt-Proof-Your-Christmas--Celebrating-the-Holidays-without-Breaking-the-Bank.pdf>
- <http://academialanguagebar.com/?ebooks/The-Emergency-State--America-s-Pursuit-of-Absolute-Security-at-All-Costs.pdf>