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978-0-521-00886-0 - The Ethical Dimensions of the Biological and Health Sciences, Second Edition

Ruth Ellen Bulger, Elizabeth Heitman and Stanley Joel Reiser

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The Ethical Dimensions of the Biological and Health Sciences, 2nd ed.

This is the second edition of an acclaimed textbook on the responsible conduct of biomedical and health sciences research. It is designed for students and faculty in health sciences and biomedical research programs, and is ideal for use in graduate programs funded by National Institutes of Health training grants. Life sciences faculty and administrators in general universities, academic health centers, and graduate schools in the health professions will also find this book a highly useful resource.

The book opens with a comprehensive history of the ethics movement in biological and health sciences, which provides context for the issues to come. The ten subsequent sections address the core ethical issues in research integrity, including the origins of ethics in scientific research, the responsible conduct of research, authorship and publication, research with persons, populations, and animals, data management, and the relationships between science and academia, science and industry, and science and society. Each one begins with an in-depth introductory essay, followed by important primary documents and classic articles from well-known scientists and ethicists, and concludes with questions for discussion and recommendations for supplemental reading. As a new feature in the second edition, the book also includes a series of cases addressing each of the ten key areas and guidelines for conducting case discussion.

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Praise for the first edition:

“... an outstanding book.” *Canadian Philosophical Reviews*

“... the editors have selected high-quality essays, and the discussion questions that follow are uniformly insightful and provocative.” *Isis*

“... a useful introduction to some of the ethical dilemmas facing research scientists ... a stimulating resource for anyone involved in biological research.” *The Lancet*

“This book will be of great value to all who are responsible for the education of biomedical scientists in the changing world, where the perception of science and scientists has changed.” *The Pharos*

“This book is a model of organization and content of a graduate course of ethics in the biological sciences. It is highly recommended not only for the personal library of a scientist or scientist-in-training but also for use in graduate ethics courses for the biological scientist.” *Doodv's Health Sciences Book Review Annual*

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Second Edition

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PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Cambridge CB2 2RU, UK

40 West 20th Street, New York, NY 10011-4211, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

Ruiz de Alarcón 13, 28014 Madrid, Spain

Dock House, The Waterfront, Cape Town 8001, South Africa

<http://www.cambridge.org>

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the written permission of Cambridge University Press.

First published 2002

Printed in the United States of America

Typeface Times 10/12 pt. *System* L^AT_EX 2_ε [TB]*A catalog record for this book is available from the British Library.**Library of Congress Cataloging in Publication data*

The ethical dimensions of the biological and health sciences / Ruth Ellen
Bulger, Elizabeth Heitman, Stanley Joel Reiser. – 2nd ed.

p. cm.

Includes bibliographical references and index.

ISBN 0-521-81053-1 (hbk.) – ISBN 0-521-00886-7 (pbk.)

1. Bioethics. I. Bulger, Ruth Ellen. II. Heitman, Elizabeth. III. Reiser, Stanley Joel.

QH332 .E73 2002

174'.957 – dc21

2001043382

ISBN 0 521 81053 1 hardback

ISBN 0 521 00886 7 paperback

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We dedicate this book to

Roger J. Bulger, M.D.

R.W. Butcher, Ph.D.,

and

to the memory of the late

Thomas F. Burks, Ph.D.

Their help was vital to
initiating and sustaining
our work in scientific ethics
and creating an ethos of
ethical concern as university
administrators and scholars.

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Preface

Biological and health research have become a public enterprise. While discoveries in this area continue to be a product of private and group work in laboratory and research centers, the social and economic effects of these discoveries have drawn the attention of powerful public constituencies – government, industry, legislatures, and the population at large – whose support is crucial to maintaining the scientific endeavor.

This new position of biomedical science was epitomized by a 1991 issue of *Time* magazine, which portrayed science as “under a microscope” and “under siege.” The review outlined a “crisis” brought on by “a budget squeeze and bureaucratic demands, internal squabbling, harassment by activists, embarrassing cases of fraud and failure, and the growing alienation of Congress and the public.”¹ That the topic could generate sufficient public interest to warrant an eight-page feature in an international magazine is itself a large part of the story.

As the discoveries of bioscience foster profound changes in our view of ourselves and our ability to overcome threats to human health and create enormous investment opportunities for entrepreneurs, bioscience is increasingly perceived as an essential social enterprise that requires both the support and decision-making involvement of those outside of the scientific community. For students and professional researchers to live in this new environment successfully, they need the knowledge necessary to understand it.

Researchers’ difficulties over the past two decades in sorting out the ethical questions involved in their work make a strong case for explicit teaching about these problems in the course of professional training. The scientific community’s experience in dealing with misconduct in research has demonstrated that faculty and students need a forum in which to discuss the ethical issues that may arise in a scientist’s career. Ethics enters into basic questions that scientists face continuously – from their responsibilities to the human and animal subjects of their research to the social consequences of their discoveries.

Until recently, many scientists have seemed content to leave such education in ethics to the role-model format: older scientists transmitting standards to younger ones by their demeanor and through random conversations and actions. But as has been well demonstrated in clinical medicine, role models, though important, are not sufficient to educate students in the complex ethical problems of modern science.

A crucial feature of disciplines that call themselves professions is systematic reflection about the ethical traditions that govern them and their relationship with society. Such reflection is critical to fostering the public trust that sustains the professions’ right of self-regulation and claims of authenticity. The consideration of the ethical dimensions of science as part of the curriculum of scientific learning and research can be tangible evidence that the scientific community warrants public trust and can serve as a major underpinning for ethical behavior in science.

Although the scientific community is developing ways to respond to unprofessional behavior, too little attention has been given to the place of education in preventing it. The time has arrived, as public and scientific concern about misconduct has demonstrated, for scientists to consider formally, through scholarship and classroom teaching, the ethical context of their work.

In 1985, prompted by an ethical conflict involving a student, and encouraged by R. W. Butcher, the dean of our graduate school of biomedical sciences, we developed a course to provide such instruction; the course has since been required of all entering graduate students in the biomedical sciences. We believed then, and believe more strongly now, that the lack of systematic teaching about the nature of scientific discovery and the scientist's life in the context of ethics leads to ambiguity about the moral aspects of gathering, interpreting, and reporting evidence; the social responsibilities of science; and the personal obligations of scientists to their colleagues, their discipline, and themselves.

The course that we designed does not enumerate standards that students must adopt or commit to memory; rather, it attempts to stimulate students' interest and to provoke them to further reading and consideration of the issues and their implications. Although honesty, integrity, truth, and professional responsibility are all key elements of the course, they are complemented by considerations of creativity, the process of discovery, and the implications of Pasteur's dictum that "in the field of experimentation, chance favors only the prepared mind."² The very existence of the course, and the requirement that entering graduate students in biomedical sciences attend it, demonstrates to students the commitment of the institution to examining ethical values within the scientific process.

A similar educational requirement was accepted in 1989 as part of the administrative guidelines for the National Research Service Award institutional training grant applications submitted to the Alcohol, Drug Abuse, and Mental Health Administration and the National Institutes of Health (NIH). As stated in the NIH Guide for Grants and Contracts, a program concerned with understanding the concepts of scientific integrity must be a part of any proposed research training effort.³

In 2000 the U.S. Public Health Service proposed a more comprehensive learning requirement for education in the responsible conduct of research, which involves a far larger range of scientific personnel that includes not only investigators but members of their research staff.⁴ To share the benefits of our experience with such a program, we developed this volume. This second edition covers all the instructional areas recommended in this new policy and incorporates the latest thinking about ethical issues in the biological and health sciences.

The book is divided into twelve parts, each of which begins with an extensive essay by one of the book's authors. Each overview essay is followed by seminal readings and documents on the subject, questions to stimulate discussion, and further references. The final section provides cases on each of the book's main subjects and a discussion of how to approach case analysis.

The book attempts to do two things. First, it presents in one place a variety of readings organized according to several fundamental topics of ethics in science. Second, the introductory essays and discussion questions in each section provide a focus on aspects that we believe warrant particular consideration.

The book introduces students to the norms of ethical conduct in science as established by the profession and by legislative bodies; scientific honesty and its relationship to objectivity and self-deception; professional policies of coauthorship and plagiarism; the use of human

beings and animals in research; the relationship between science, scientists, industry, and society; the ethics and process of data management, collaboration, and peer review; and the ethics of teaching and learning. The readings also provide an opportunity to discuss other issues basic to research but often not formally considered in graduate science education such as methods of scientific investigation (and scientists' difficulty thinking outside the paradigm upon which their own work is based), the creative process, and the problem of describing reality.

Many of the previously published articles reprinted here are considered classics. Some that are less well known are nonetheless personal favorites, either for their clarity, insight, or ability to spark discussion. We have reproduced these articles in as close to their original form as possible, resulting in a wide variety of reference styles and occasional editorial discrepancies across the volume. (Unfortunately, we were unable to include the figures in two articles; however, in each case the authors' respective descriptions of their data make clear what the figures were intended to illustrate.) We are thankful to the many authors and publishers who gave us permission to reprint their copyrighted works.

The three authors collectively have education and work experience in laboratory science, clinical medicine, health policy, history, and ethics and currently teach courses in the ethics of the biological and health sciences. We have used several formats in teaching this material. For some subjects we used predominantly a lecture approach, whereas other sessions were led in a Socratic style; however, time has always been reserved for group discussion, and the readings provide many issues for debate. In class we have also supplemented these readings with material from our own academic environment. For example, to consider using animals in research, the students have served as an Animal Care and Use Committee, reviewing a fictitious application on the forms used by our institution. Because many of our students have worked in a laboratory, their experiences have also been a focus for discussion. We recommend that the general material in this book be tailored similarly to the specific needs and situations of the students and institutions that will use it.

For their work on this second edition we are grateful to Janice Glover, Sheryl Hamilton, and Michael C. Rossa. Our thanks also go to Kristin Heitman and Lida Anestidou for their critical commentary on several of the essays.

As regards the contributions of Ruth Bulger to this book, her opinions and assertions are private ones and are not to be construed as official comments of, or to reflect the views of, the U.S. Department of Defense or the Uniformed Services University of the Health Sciences.

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