

THE ROUTLEDGE SERIES INTEGRATING SCIENCE AND CULTURE

SEX/GENDER

BIOLOGY IN A SOCIAL WORLD

ANNE FAUSTO-STERLING

ROUTLEDGE

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Sex/Gender

This book provides a clearly written explanation of the biological and cultural underpinnings of sex/gender. Anne Fausto-Sterling provides an introduction to the biochemistry, neurobiology, and social construction of sex/gender with expertise and humor in a style accessible to a wide variety of readers. In addition to the basics, *Sex/Gender* ponders the moral, ethical, social, and political side to this inescapable subject.

Anne Fausto-Sterling, the Nancy Duke Lewis Professor of Biology and Gender Studies at Brown University, is a leading expert on the development of gender identity as well as the biology of gender. Her latest research analyzes the emergence of behavioral differences between the sexes in early childhood. She is the author of two earlier books: *Myths of Gender: Biological Theories about Women and Men* (Basic, 1993) and *Sexing the Body: Gender Politics and the Construction of Sexuality* (Basic, 2000).

The Routledge Series Integrating Science and Culture

Editor: Lennard J. Davis, University of Illinois at Chicago

The Routledge Series Integrating Science and Culture aims to reunite the major discourses of science and the humanities which parted ways about 150 years ago. Each book picks an important topic that can best be understood by a synthesis of the best science and the best social and cultural analysis. In an age when more and more major political and life decisions involve complex understandings of science, medicine, and technology, we need to have a bioculturally sophisticated citizenry who can weigh in on these important issues. To that end these books aim to reach a wide swathe of people, presenting the information in readable, illustrated, succinct editions that are designed for classroom and scholarly use as well as for public consumption.

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Sex/Gender

Biology in a Social World

Anne Fausto-Sterling



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This book is dedicated to Samuel Philip and
Rebecca Claire Graves and to Carl Luke Vogel. They
are the ones who will reshape the future of gender-in-the-world.

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SERIES FOREWORD

The Routledge Series Integrating Science and Culture aims to restore connections between the sciences and the humanities, connections that were severed over 150 years ago. This mutual exclusion was done in the name of expertise on the part of science and defended in the name of preserving values and morality in the world of humanism. In some sense, each side was seen as the societal enemy of the other. From the humanists' perspective, scientists threatened to make the world a colder, more efficient place lacking in feelings and values. From the scientists' viewpoint, humanists were interfering with progress by injecting bleeding hearts and unreasonable fears into an essentially rational process.

But the reality is that now, in the 21st century it is getting harder and harder for humanists to comment on civic and social matters without knowing something about science, medicine, and technology. Suddenly there is the need to understand stem cells, brain scans, DNA technologies, organ transplants, ecological outcomes, and the like in order to be a knowledgeable citizen, legislator, or scholar. Likewise, scientists routinely include the ethical, social, cultural, and legal in their research protocols and scientific articles. The divide between the "two cultures" described by C. P. Snow in the 1950s is less and less possible in the 21st century. On the ground, humanists and scientists are again in need of each other.

To that end, the books in this series will focus on the cultural side of science and the scientific side of culture. David Morris and I have coined the term “biocultural” to indicate this new realm of study and critique. In that spirit, Anne Fausto-Sterling’s book helps us think about the topics of gender and sexuality in ways that make it impossible to ever consider these subjects as independent from a social-cultural matrix. Yet, Fausto-Sterling also makes it impossible to think of the very same subject as independent from a biological endowment, as well. The genius of this book is that it exploits the author’s expertise as both a biologist and a social-cultural analyst. Given her knowledge of cell biology and gender studies, Fausto-Sterling brings to the series a layered, nuanced, and complex view of something that many people consider simple. But while you may be able to sex a puppy rather easily, the complex role of gender in human culture, biology, and psychology needs more investigation than just a casual glance. This book—to the point, humorous, and wise—provides the best introduction to the field that I can imagine.

Lennard J. Davis

Series Editor

PREFACE

One reason I rarely attend large parties with many strangers is that I hate it when people ask me what I do. As soon as I say I'm a biologist, my interlocutor winces, falls silent, or murmurs something about having done badly in high school biology. I get these responses from highly accomplished academics in the humanities and social sciences. As I said, I hate this. My conversation partner may think all biology is irrelevant to the great philosophical issues of the world—equality, suffering, hunger, etc. Or he or she may feel that biology is an urgent subject, but one he or she feels too inadequate to discuss. I, on the other hand, feel that biology holds one (not the only—by a long shot) approach to understanding critical world issues *and* that anyone interested enough to pay attention can learn to read and interpret biology with a suitably critical eye.

What do I mean by a suitably critical eye? We encounter many misuses of biology—oversimplifications of research findings about the origins of human sexuality or claims that biological difference explains differences in achievement or other large inequalities. This makes it all the more important that students of the humanities and the social sciences learn a form of biology that provides them with tools to analyze these aspects of the world. And so, when Lennard Davis, the general editor of the series in which this book appears, wrote me with a proposal to write a *short* book on sex and gender for *The Routledge Series Integrating Science and Culture* I jumped at the chance.

As I understood my task, I was to write a brief treatment about biology, sex, and gender; the book was to place our current biological knowledge in an historical and cultural framework. The aim was to provide interested readers with a way to understand and think critically about at least some of what they hear in the popular press and in casual conversation about sex and gender. Lennard Davis also asked that I analyze the state of our knowledge. What do we know? What do we think we know? What might we be able to find out in the future? What questions might be impossible to answer? And I confess to having a secret goal—to convey my own enthusiasm for the study of the biological world—the worms and flies as well as the humans.

This book should find a place as a companion text in general science courses, introductory biology and psychology courses, gender studies courses, and a variety of introductory and more specialized courses in psychology, sociology, anthropology, and the humanities. Instructors in such courses face certain types of problems. Issues arise that are outside of the instructor's realm of expertise. Or, the standard texts that address biology and gender are insufficiently critical or fail to integrate information into a broader social and historical context. Or, they talk down to the learners (in this case instructor and student alike), using what feminist scholar Donna Haraway calls the God-Trick—speaking from everywhere and nowhere at the same time. This book might provide concise approaches that would help the instructor and students join together to investigate biological aspects of the question of gender together.

In the case of the “straight” science courses the comprehensive required text is dry, weighs a lot more than the modern laptop, and overwhelms students with its presentation of fact after fact. Usually such facts remain unattached to what students find important in daily life. Perhaps a short, focused book about a topic of great interest to youthful students (sex!!), written with a little humor, and a gloss on certain details might help. The biologists and psychologists will have to be patient with the fact that I sometimes use popular language rather than precise scientific terminology. This is the privilege of the popular science writer. Of course, sociologists will want more sociology in this book, anthropologists more anthropology, and psychologists more psychology. That's what the

Further Reading section at the end of each chapter is for. And, of course, different instructors and lay readers are likely to bring some of their own strengths to the reading experience. They can fill in bits that I left out.

In *Sex/Gender: Biology in a Social World* I try to build a method of analysis that readers can use now and in the future as they consider questions of biology. The most important tenet is “don’t get stuck trying to divide nature from nurture.” Instead, think developmentally. Remember that living bodies are dynamic systems that develop and change in response to their social and historical contexts. This is as true for rodents as it is for humans. And appreciate biological diversity. Just because rats do gender one way, doesn’t mean that prairie voles or Japanese macaques or humans do it the same way. To me, one of the wonders of the natural world is its biological diversity.

I have striven for a lively read. For this reason some of my chapters are very short, making a single interesting point. Others are longer but sometimes with short sections. I emphasize biology, but I tie matters to sociological and cultural processes (although these latter are not the main focus of the book). Finally, the chapter sequence is organized roughly, as a developmental sequence, based on sex/gender as it unfolds from fertilization through early childhood. At the very end, I turn more topical with chapters on human sexuality and on childhood sex differences.

To access color versions of selected figures in this text, readers of the electronic version of this book can make use of hyperlinks embedded in the URLs in the captions, where indicated. Readers of the traditional, print-based version can access the same web pages by referring to the URLs and directions given.

Last, but not least, I want to acknowledge the generous and prompt help from Lennard Davis, series editor, the Routledge editors Steven Rutter and Leah Babb-Rosenfeld, and those who reviewed the book: Judith Howard at the University of Washington, Sally Raskoff at Los Angeles Valley College, and Marianna Litovich at Wesleyan College. Most importantly, my wife Paula A. Vogel enthusiastically read the entire manuscript as I produced it and helped me to feel that I was on the right track. As with most things in life, I couldn’t do these projects without her love and support.

A GENDERLESS FUTURE?

What were they thinking! In March, 2010 the New South Wales (Australia) Registry of Births, Deaths and Marriages sent Scottish-born Norrie May-Welby an immigration certificate listing her as “sex not specified.” The bureaucratic decision to allow May-Welby to immigrate without specifying his/her sex or gender came after an extended legal battle. As it turned out, May-Welby’s official genderlessness was a way station in a struggle that continues as of this writing. Following intense publicity, the Registry backtracked, claiming it did not have legal authority to produce a gender neutral certificate. May-Welby is suing. Moreover, May-Welby is not the only person on earth who wishes to live gender free. Reporters Barbara Kantrowitz and Pat Wingert suggest that a growing number of people consider themselves gender neutral (Kantrowitz & Wingert, 2010).

Confusion about gender categories (Male? Female? Neither? Both?) seems to be perennially newsworthy. Take the case of the South African runner Caster Semenya. During the summer of 2009, she beat the women’s 800-meter running record by several seconds. Although her achievement remained a good 18 seconds off the men’s record, her breakthrough prompted complaints that Ms. Semenya was really a man. An international scandal erupted when the International Association of