Lynn Hankinson Nelson
Biology and Feminism: A Philosophical Introduction
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Reviewed by Lynda Birke, 2019

Lynda Birke is a visiting professor in Biological Sciences, University of Chester, UK. Originally trained in biology, she has focused on cross-disciplinary research, and published extensively in feminist science studies, and more recently in human-animal studies. Her current research includes studies of human-animal relationships.

Quote: "Quibbles aside, Nelson addresses one pivotal question: has feminist engagement actually changed the science?"

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The life sciences, concerned with how living organisms survive, reproduce, and manage their lives, have much to say about sex and gender--whether that be how gender differences evolved, or what physical form(s) they take within a species--questions clearly of interest to feminism. Feminist science scholarship has focused on analyzing, and sometimes challenging, claims about gender made in the biological sciences: Are these claims justified? Do they take into account other ways in which gender is created? How good is the science? In this sense, the point is not only to understand and/or challenge the claims, but also to identify the social/scientific contexts in which those claims are produced. Both feminist analysis of gender claims, and the biological theories themselves, in turn pose philosophical questions about the nature of knowledge and its production.

Lynn Hankinson Nelson's book, *Biology and Feminism: A Philosophical Introduction*, offers an important outline of key philosophical issues threading through biology's concerns with gender, as well as feminist critiques. Much in the history of biological thought has drawn feminist attention, from claims that men are superior to women, to unacknowledged biases (using only males in sample populations, for example), to the use of gendered metaphors (such as seeing the ovum as "passive" and sperm as "active"), to questions of equity (Who gets to do science? Who gets the final say?). Inevitably, a substantial part of feminist engagement has been critical; but many, including some feminist biologists themselves, have argued that to take seriously feminist critiques is to move toward a better science--one that is more whole, more representative of all of us. These may be feminist questions, but they simultaneously raise significant philosophical questions.

Nelson is herself a philosopher who has long specialized in philosophical issues in science. She is thus uniquely placed to raise some of the complex issues generated in these debates. To this end, she interweaves analysis of feminist critiques and comments with abstract philosophical questions. She considers, for example, what the consequences are of the scientific insistence on objectivity, how observations are not just "made," but are theory-laden, what constitutes evidence (and evidence-based reasoning) in science, and how the wider context influences the claims that scientists make ("contextualism"). She also considers in detail feminist critiques of biological determinism, and the use of gendered language and metaphor in biological texts, as well as asking what the impacts are, if any, of feminist engagements.

Nelson considers several areas of biology, beginning with Darwin and evolution--particularly his idea of sexual selection--before turning to more recent debates about evolution, especially in the areas of human sociobiology and evolutionary psychology. She also considers primatology: it is among the other primates that we find those most like us, and in whom we sometimes see reflections of human behavior. In this sense, primatology throws up many instances of how observers see and interpret gender differences. Other areas of biology discussed are developmental biology (especially how sex/gender differences develop embryologically), medicine (including sexist assumptions about women's bodies, and the predominance of males in clinical research samples), and neurobiology (for example, claims about gender difference in brain function).

Each chapter introduces its theme and uses historical examples to document how ideas change. So, the chapter on primatology outlines the way the field developed in its early years and the social influences on primatological thought (with a shift in emphasis away from "dominant males" as drivers of primate social organization), and the chapter on medicine outlines the dichotomous constructions of sexual anatomy prevalent in earlier centuries. Such historical examples enable us to see how biological ideas have in the past drawn on gendered stereotypes, while setting the scene for more detailed questioning of assumptions in modern science, as well as in feminist readings of that science. This is not to say, Nelson points out, that historical ideas were "bad science"; on the contrary, they were often good science in terms of what was known at the time. This is an important point, for it is all too easy to offer critiques of science, past or present, that focus on flaws in reasoning without acknowledging the context in which scientists operated.

This interweaving of biological theory, feminist critiques, and philosophical questions is one of the major strengths of this book. Nelson examines in detail the role of background assumptions in scientific reasoning and analyzes both the history of relevant ideas and how feminist critics have engaged with them. Importantly, she reminds us that historically, philosophy has focused on individual sensory experiences in knowledge-production, but that is now shifting toward greater emphasis on knowledge as social. This includes arguments made by feminist philosophers who join calls to develop "accounts of the epistemology of science that study the social factors that are part of scientific reasoning and practice" (7). As Nelson points out, this shift toward a more social epistemology challenges traditional views of scientific objectivity as something individually achievable.

Nelson is particularly interested in evolutionary theory. Undoubtedly, this has had considerable influence in how biologists think about sex/gender, especially through Darwinian ideas of sexual selection. Evolution is, moreover, central to biological thought: every course I ever took as a student in life sciences framed teaching and concepts around how this or that feature of a species might have evolved--whether that be molecules or behavior of the whole organism. In this sense, Nelson's focus on evolutionary ideas in this book is warranted: not only does evolution pose questions that have challenged feminists, but it also poses questions of great philosophical importance.

Yet that focus on evolution (which takes up a great deal of the book) means that some areas of biology get short shrift. To be sure, space is short, and it is impossible for one book to cover everything. But even so, I was surprised to see little or no coverage of modern genetics and genomics (both of considerable interest to feminist science scholars, and subjects of several recent

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research studies). Recent scientific work in (say) genetic modification raises many philosophical or ethical questions--above all, feminist questions of bioethics.

I was also surprised to see no mention of sexuality--a topic fairly central to feminist interests, and a recurring theme in gender or queer studies literatures. There is no reference at all to homosexuality; this is strange, since there have been many attempts in scientific accounts to "explain" homosexuality--through evolution, through genetics, through hormonal explanations--and critiques of these have appeared regularly in feminist science studies. There is a brief reference to heterosexual evolution, but that is all. Nor is there reference to the heteronormativity of much brain research--also the subject of recent critique from feminist and queer theorists.

To take a broad sweep of a multilayered literature is difficult. Inevitably, the writer must resort to talking about generalizations, such as "feminists." Indeed, I am doing precisely that in writing this review, and I can never escape the problem whenever I write about "women," "feminism," or "animals." But I did sometimes find myself becoming irked, as I often did not understand what or who the generalized "feminists" were in this volume. It is obviously not possible to cite every feminist author, but it did seem as though there were big gaps: much of the feminist work referenced seems to be quite old, and predominantly from North America. Where are the citations to recent work in feminist science scholarship? Or to scholars from elsewhere?

Although it is almost impossible to avoid referring to the generic "feminists," doing so presents problems: not only the risk of homogenization just noted, but also that it challenges one of the feminist insights that is discussed in the book--namely, the situatedness of the knower/producer of knowledge. I wanted to know who the feminists were who challenged this or that biological idea. Given the emphasis in the book on the importance of contextualism, it inevitably feels odd to read about "feminist" arguments as a generalization. Perhaps more citations early on of specific feminist writers to give examples and a flavor of such critiques would have helped to set the scene.

Quibbles aside, Nelson addresses one pivotal question: has feminist engagement actually changed the science? She notes that in some areas, such as primatology and developmental biology, there is now greater gender parity and more awareness of the impact of gendered assumptions on scientific reasoning. Whatever role feminism has played, it has undoubtedly been part of the context.

Still, those challenges have been contested: Nelson recounts how some developmental biologists, for instance, have resisted any connection of their science to feminism. There are many reasons for this resistance, such as the supposition that to speak of "feminist" science is to imply that it is "soft," "feminine," somehow less scientific. But the important point is that there have indeed been changes in some areas of biological science that are consistent with feminist critiques. These changes are not occurring solely in response to feminism, she points out, but because researchers increasingly recognize that it would be better science to include (say) the perspective of female primates.

Many disputes are disputes about evidence: scientists make claims that they are merely describing nature, and are saying nothing about what is morally right or wrong. But those claims carry social and political implications. As Nelson argues, if claims do have such implications, then it matters a great deal that high standards of evidence are used. She urges: "[t]he feminist arguments we have considered reflect a simple, and upon reflection surely obvious, concern, that hypotheses about

sex, or sex/gender, and the assumptions underlying and informing them, be empirically warranted" (226-27). There are profound consequences when hypotheses are put forward about, say, hormonal differences in fetal development leading to gender differences in mathematical abilities, and convincing evidence is required. Nelson notes parallels between feminist critiques and arguments raised by critics of recombinant DNA technology: "both emphasize the fallibility of science and the social implications of areas of scientific research" (233). But they also differ, she suggests, in that feminists seldom argue that research on sex differences should never be done, rather that it should be done very "carefully and responsibly."

In teasing apart many of the claims and counterclaims made about gender by scientists and feminists alike, Nelson points out logical inconsistencies; throughout the book, she also draws out some of the social and political consequences of the arguments she analyzes, and brings these together in the concluding chapter, which provides an overview of ethics and socially responsible science. One assumption that pervades many discussions of ethics in science is that "bringing about socially responsible science is solely the responsibility of scientists" (236). On the contrary, she urges, it is the responsibility of many, many stakeholders: from policymakers, to philosophers, to the wider public. There is, Nelson believes, greater interest now in debating such responsibilities, in making both science and philosophy socially relevant, and in disavowing any opposition between "facts" and "values." Feminist concerns with science not only focus on critiques of determinist claims, or the dearth of female subjects, or on gender bias; indeed, one significant goal of feminist critics has been to promote ethically responsible science: a science that is always subject to questioning, and that is accountable to everyone. This is an important goal; our voices have long been--and should continue to be--part of a wider interrogation of scientific stories.

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