Book Reviews

Sergio Sismondo:
An Introduction to Science and Technology Studies
Blackwell Publishing. Malden and Oxford, 2004. 202 pages.

In this book Sergio Sismondo provides a concise overview of science and technology studies (S&TS) that is primarily directed at upper division undergraduates. While the book presupposes no background in S&TS, it draws from philosophy in ways that may be challenging for undergraduates unfamiliar with thinkers like Hume, Kant, and Wittgenstein, as well as concepts like induction, incommensurability, and positivism. With an overall structure that I describe below, the book may be especially useful as a reference, providing brief introductions on focused topics, to complement S&TS syllabi for undergraduate or even graduate courses built around case studies. Sismondo's book will also be a helpful reference for doctoral students preparing for qualifying exams in science studies.

Sismondo presents this overview in sixteen chapters, each of approximately ten pages in length. Each chapter addresses a theoretical tradition (like actor-network theory) or a methodological approach (like controversies) or a thematic issue (like standardization and objectivity). Thirty text boxes of approximately one page each are distributed throughout the book, providing greater detail on specific concepts (like underdetermination), theoretical debates (like realism and empiricism), research topics (like genetically modified organisms), and case studies (like Wynne on sheep farming). Because each chapter has minimal dependencies on the others, chapters could be read selectively and in any order. Recurring issues are addressed in the text boxes that are cross-referenced across chapters.

Given this overall structure, I found a few organizational aspects that could have made for an even stronger work. With focused chapters that fall into implicit categories, it would have been helpful to group the chapters into parts on theoretical orientations, methodological approaches, thematic issues, and possibly research topics. By beginning chapters and sections with simple views of science and technology, Sismondo seeks to appeal to students' common sense understanding and then complicate that understanding with the more nuanced perspective of S&TS. I found this narrative strategy, however, to frame S&TS in reactionary terms: it assumes that readers have naive views and then sets out to correct them. From an organizational perspective, this strategy is a bit confusing because chapters and sections are introduced with explanations

of what the following paragraphs debunk.

Any introduction to science and technology studies is necessarily an origin story about the field. Explaining the discipline requires decisions about what is and is not S&TS, as well as how to motivate the field's central concerns. Given the disciplinary, theoretical, and topical heterogeneity of S&TS – and the role of this diversity in the field's creative energy – writing such an introduction is a delicate venture. Sismondo takes a straightforward approach to the field when he writes, "The emphases of the book could have been different, but they could not have been very different while still being an introduction to central topics in S&TS" (vi). In Sismondo's introduction, the origins of S&TS lie in the philosophy of science, the institutional sociology of science, and the sociology of scientific knowledge. This orientation establishes the trajectory of the book: the chapters emphasize science over technology and facts over artefacts. They similarly emphasize the context of production for science and technology over the context of their use or application. The cumulative outcome of these emphases is extensive discussion on the production of scientific knowledge and modest discussion on technology and material culture in social and political life. For example, the literatures on large technical systems and the social construction of technology – arguably obligatory passage points in S&TS – receive limited attention.

While not to deny the significance of actor-network theory, controversy studies, and the like, an introduction to science and technology studies might also address technology assessment, science and technology policy, ethnographic studies outside of the laboratory, anti-racist studies, participatory design, social movements, and philosophy of technology. Similarly, an introduction might take a topical approach to such contemporary research areas as information technology, biotechnology, globalization, health, the environment, and democracy. In such approaches, it would be comparatively difficult to emphasize the production of scientific knowledge at the expense of these other research areas. For example, Sismondo explains, "In S&TS, most studies of technology focus on the relatively `upstream' worlds of engineers, perhaps in interaction with scientists and/or entrepreneurs. There are relatively few detailed studies of the `downstream' worlds of users" (137). This upstream/downstream dualism reproduces the importance of production contexts over use contexts. It points to a body of research that studies technoscience by examining the actor groups involved in its creation. These S&TS scholars have complicated linear narratives by focusing on controversies that highlight the social, political, and cultural dimensions of technoscientific change. In contrast to the social shaping of the technical, S&TS has also studied the technical shaping of the social – what Sismondo calls the "downstream" studies. These studies examine science and technology to understand how social problems are shaped by scientific knowledge, technical decision-making, and material forms. In Sismondo's introduction, how science and technology shape people's lives appears to be an underdeveloped area of S&TS scholarship.

Along with which literatures constitute S&TS, my major criticism of Sismondo's book is that it does not provide a system-

atic treatment of the symmetry principle in light of normative S&TS. Sismondo describes the central role of symmetry to the success of the strong programme in providing a sociological account of scientific knowledge. His explanation provides an implicit contrast with normative elements of other approaches: theory evaluation in the philosophy of science and the descriptive versus prescriptive possibilities for Mertonian norms. In particular, Sismondo does not address the challenge to symmetry posed by feminist S&TS. For an introduction to the field, an explicit discussion of symmetrical and normative approaches would address an important and timely debate. It also would provide insights for undergraduates on how to think critically about science and technology. Arguably, this area is one of the best ways for S&TS to be relevant to an undergraduate education. I imagine that insightful students will question this tension between the symmetry principle and feminist S&TS, generating provocative discussions in the classroom.

Because science and technology are socially constructed, one might ask how science and technology could be reconstructed along more equitable, sustainable, or democratic lines. While normativity is a controversial topic in S&TS, I understand it as a central debate to the contemporary state of the field. As a descriptive project, S&TS is exemplified by the sociology of scientific knowledge and the social construction of technology: both explain the success and failure of facts and artifacts in social terms that do not invoke the truth of science or the efficacy of technology. With these research traditions as a reference point, contemporary work in S&TS is examining the construction of science and technology as part of the construction of social, political, and cultural life. Such approaches may identify particular metrics that provide positions from which to evaluate science and technology. For example, feminist S&TS uses gender inequality (and social inequality more generally) as a metric for taking normative positions on how technoscience should be conducted differently. This normative dimension of S&TS is recognizable in research on technology assessment, science and technology policy, anti-racist studies, participatory design, and health and environmental social movements.

To be fair, it's too easy of a criticism that an introduction to S&TS would be better if it covered more ground. This point is especially true for Sismondo's book: his concise treatments of expansive literatures are a significant accomplishment. A number of chapters, however, might have been replaced with some of this other material. For example, Chapter 1, "The Prehistory of Science and Technology Studies," begins with a naive realist view of science and sets out to challenge it with major movements in the philosophy of science since the Vienna Circle. Chapter 2 follows this trajectory with an extended analysis of Thomas Kuhn. While this intellectual history is important to scholars, I question its value to undergraduate education outside of philosophy courses. In contrast, Chapter 6 on social constructivism provides an effective introduction, explaining the theoretical commonality that underlies S&TS as a heterogeneous field. Additionally, the chapters on "Standardization and Objectivity," "Creating Order, Following Rules," and "The Unnaturalness of Science and Technology" provide

greater and possibly unnecessary detail on the debates between constructivism and realism. Especially in the context of undergraduate education, I believe such space could be better used addressing how science and technology shape social, cultural, and political life. For example, anti-racist and postcolonial studies are addressed in a section at the end of the chapter on "Feminist S&TS and its Extensions." Other areas like technology assessment, science and technology policy, social construction of technology, and large technical systems receive little discussion.

In this review, I have alluded to contemporary debates over the core and boundaries of S&TS for examining Sismondo's *An Introduction to Science and Technology Studies*. Those who recognize the sociology of scientific knowledge, actor-network theory, laboratory studies, and controversy studies as the core of S&TS will appreciate this focus. For those interested in technology studies, policy issues, and critical S&TS, readers may find an introduction that gives undo emphasis to the philosophy and sociology of science. To address this heterogeneity, this introduction could be presented in terms of the disciplinary, methodological, and theoretical diversity of S&TS, conveying for students a sense of the field's dynamism. How to introduce science and technology studies is a provocative question because the difficulties of defining the field suggest its most generative characteristics.

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Christopher Hitchcock (ed.):
Contemporary Debates in Philosophy of Science.
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This book is the first in a new series of philosophy textbooks by Routledge. The concept of the *Contemporary Debates* series is interesting. The idea is to introduce students to contemporary debates via real philosophical debate. Rather than collecting classic articles, the editor organizes a series of real philosophical encounters. All the contributions are written specifically for the volume and the authors have agreed on the specific question they disagree on. The objective is to avoid a situation where the supposedly opposing views end up talking past each other. This idea is fresh and promising. Everything depends, however, on the editor. Both the issues to be debated and the authors have to be chosen carefully. Furthermore, the authors require more supervision than in an ordinary