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**Review of 'Gender in Science and Technology  
Interdisciplinary Approaches'  
edited by Waltraud Ernst & Ilona Horwath**

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**REVIEW**

Waltraud Ernst and Ilona Horwath's edited book *Gender in Science and Technology: Interdisciplinary Approaches* is a highly welcome, thoughtful and exciting contribution to the still growing body of literature on feminist science and technology studies (FSTS). Its overall aim is 'to show how reflecting upon gender in manifold critical ways can help overcome gender hierarchies, exclusion practices, stereotypes, and other epistemic, ethical, and political problems' (Ernst & Horwath, 2014, p.7). The book is aimed at academics and students with some background in gender/feminist theory and research, who are interested in how science and technology is a site for gender construction, as well as for academics and students in science and technology studies (STS) interested in learning or developing a gendered approach to researching science and technology. However, some of the essays might be slightly challenging for some readers as they presuppose quite a high analytic understanding of gender theory. Just like FSTS, this book is – as the title indicates – interdisciplinary, in terms of the backgrounds of the authors and the methodologies that are discussed. But the open and honest overall commitment to social and political change, of scholars' responsibility for the impact of their work, is worthy of praise as well as bringing a fresh breath of air into the field of STS.

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The book is divided into three parts, each covering an integral aspect or broad theme in the study of gender in science and technology, consisting of three to four independent essay contributions by a range of authors. Some chapters are more like review essays, whilst others discuss methodologies in more depth or offer original research. Part A, 'Gender in the Design Processes of New Technologies', has contributions from Anne Balsamo, Els Rommes, Corinna Bath, and Cecile K.M. Crutzen. The focus is on the role that designers play in gendering technological artefacts and their potentially emancipatory role in re-thinking how design might move away from a binary-approach to a spectrum-approach of gender. Designers play a crucial part in the (re)production of gender, and they have often resorted to and heavily relied upon stereotypes when designing a new technology. For instance, Rommes' chapter, which analyses commonly used design methodologies and their often problematic effects, is especially strong and informative, as is Balsamo's account of 'how digital technologies could be used in the service of feminist political activism' (p.31). Part B, 'Gender in Epistemological Foundations of Science and Technology', has contributions from Rebecca Jordan-Young, Barbara Orland, Waltraud Ernst, and Lena Trojer. It offers in depth analysis of how ideas and practices of gender are configured, including the disputed and problematic science of trying to determine the source of 'femaleness' and 'maleness'. The emphasis here is put on dissecting different gendered assumptions (such as sex and sexuality necessarily having to be dichotomous) and problematizing the ways in which these assumptions inform and limit science in general, and endocrinology (Jordan-Young) and biology (Ernst) in particular. Part C is about 'Reflecting Un/equal Conditions for Participation', with contributions by Wendy Faulkner; Ilona Horwath, Nicole Kronberger & Markus Appel; Andrea Blunck, Anina Mischau and Sabine Mehlmann. They comprehensively reflect on the un/equal situation for women in STEM (Science, Technology, Engineering, Mathematics). As a last section, the book ends on a high: every chapter is well-crafted, slightly easier to follow and read than previous sections, and they cover a range of gendered differences in experiences and ideas of engineering. Faulkner's introductory essay should especially be given honorary mention in regards to her excellent analysis of women engineers' struggle with (in) authenticity as scientists. It is likely to become a must-read for any student or academic interested in the theme.

Overall, this book successfully provides ways to re-think or study gender as a system, doing or apparatus. Whilst covering a wide range of topics, the book is of course not an all-inclusive guide to how gender plays out in science and technology. As Balsamo notes, as feminist scholars in STS '[w]e need maps and tools, not simply to theorize with, but also to guide us to act and transform the worlds within which we live' (p.36). The book asks many fascinating questions, and answers some, whilst leaving others open for the reader to explore on their own. Often you catch yourself with a new-found inspiration to research gender in science and technology. Another remarkable aspect of the book as a whole is the attempt to move away from dualistic conceptions of gender, or the dichotomous reinforcement that can occur in gender studies as well as in FSTS. It does so by providing theoretical alternatives as well as some practical suggestions as to how to go about conducting research through a gendered lens (or rather, apparatus) without reinforcing gender binaries. The practical suggestions include involvement in design and math teaching. In doing so, the book actively challenges the status quo of gender theory and research, and addresses and dissects still persuasive gender stereotypes related to STEM and the field of STS. The result is a book about how to practice gender sensitivity as a researcher, whilst also acknowledging that there is not one way of doing FSTS. Rather they acknowledge and suggest that there always 'is the possibility to take gender into account in a theoretically reflected and methodologically systematic way in order to counteract

problematic gendering' (p.10). Furthermore, it also encourages us to self-reflection as designers, scientists, engineers and social researchers: a self-reflexivity that requires a move away from detached scholarship towards a scholarship of accountability for the knowledge-claims one makes.

What is particularly interesting in this volume is its challenge of the 'naturalness' of binaries, gender and other, in science: the assumption that everything in the natural as well as social world is male or female, 'man' or 'woman', and the fact that this is a problem that is difficult to avoid in gender studies as well. The book raises wider issues about how to go about studying gender, about how and whether to study women or men as categories whilst allowing for heterogeneity (see intersectionality). It addresses a very important but tricky aspect of the field: gender as fluid but with real lived experiences and consequences. However, for the most part none of the essays really deal with the intersections of gender, which could have been improved by either introducing examples of how other categories of difference interplay with gender (such as race, class and sexuality) creating different experiences of and outcomes of STEM. Another minor critique is the relative focus on individuals – especially in Part A – and their gendered choices. This emphasis neglects the fact that designers, for example, are embedded in large social, cultural and economic systems that inform and fundamentally construct their choices and behaviours. These systems are largely unexplored and there is a danger in making something like design primarily about the individual's decisions (even if it can be easier to deal with gendered biases on an individual level). Finally, the book as a whole deals primarily with constructions of woman, womanhood and femininities in science and technology – tacitly, perhaps, making it seem as if gender is only about women. A way to avoid this would have been to include research and theorising on the constructions of man, manhood and masculinities as well as queer theory. These inclusions would have contributed to the crucial need to make "the male" and non-binary visible in processes of gender.

Notwithstanding these criticisms, *Gender in Science and Technology Interdisciplinary Approaches* is a highly informative, thought-provoking and well-structured contribution to the field of Feminist Science and Technology Studies and an inspiration for any student, academic or researcher interested in ways of challenging inequalities of and in science and technology.