



BOOK REVIEW

With microbes

Edited by Charlotte Brives, Matthäus Rest & Salla Sariola, 2021

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With Microbes offers an analysis of the multiple, complex and dynamic relationships between humans and microbes and their entanglement in everyday life. Microbes have gained much attention from scientists, in popular culture, and by various actors looking to economize and regulate microbes, discussing questions such as the relationship between gut microbes and brain activity, the best ways to nurture kombuchas and sourdough starters, or use and understanding of microbes as medicine. I was intrigued to read the book both due to my own interest in nurturing a good microbiome and wanting to review how one can approach the subject through an innovative science and technology studies (STS) approach.

The book is a rich contribution to this growing field of microbe research and to STS. Published as part of the book series from Mattering Press which focuses on empirically grounded analysis of research on science, technology and society, the book uses STS lenses and theories from related fields such as anthropology and philosophy to probe how human-microbe relationships are enacted as various hybrid forms in multiple social worlds. Reflecting the cutting-edge approach, the book is also written in an experimental way by offering QR codes readers can use to listen to recordings of yeast (Chapter 1), to presenting findings as a theatrical dialogue piece which gives voice to E.coli (Chapter 9). This makes the book an enjoyable read that starts with an intriguing introduction.

In the introductory chapter, the authors object to essentialist views on microbes and the objective role of scientists as their 'knowers'. Instead, they take their understanding of human entanglement with microbes seriously. They enact this by taking an innovative approach to the writing of the introduction, not as a composition of singular authors, but as a collective called *The Kilpisjärvi Collective*. This collective approach to developing and framing the book is also reflected in its methodological foundation.

The methodology rests on the principle that the relationship between microbes and humans is everchanging and mutually constitutive. The authors are approaching microbes not as neutral scientists, or in Latour's (1993) words, as 'modest witnesses', but rather 'witnessing' microbes. To be 'with' refers to the ever entangled and mutually constitutive relationship between microbes and humans, knowers and the known. They therefore do not give greater legitimacy and power to either microbes or

humans but draw on Haraway's (2016) view of the relationship as an "assemblage of symbionts" (p.21). Rather, the chapters in the book present fluid, partial and situated accounts of human-microbe relations.

The book is an anthology and includes 12 chapters divided into three well-structured sections – sensing, regulating and identifying – each focusing on one aspect relating to microbes. First, *Sensing* focuses on how microbes are made known and made sense of. Each chapter illustrates how different groups are enacting microbes through sensing. From winemakers in France who listen to the sound of yeast (Chapter 1), to bokashi composters who use smelling and touching to develop fermented kitchen waste (Chapter 2), cheesemakers in the Alps who use touch and smell to assess cheese quality (Chapter 3), and finally, vaccine-refusing parents who are nurturing their children's immune system through interspecies health practices (Chapter 4). All chapters highlight how the sensory practices and relationships with microbes often depart from standardized practices such as traditional winemaking protocols or relationships to waste. They show different ways of knowing and understanding microbes, often challenging established politics.

The second section of the book, titled *Regulating*, focuses on the governance and management of microbes and how they are used and understood. In Chapter 5, Huttunen, Oinas and Sariola study participants in a vaccine study, finding that their experiences of microbes are contextualized and thus diverse. Fortané, Legrand and Meulemans's describes how new purposes for the River Seine in France change the framings of microbes and their regulation (Chapter 6). Most pronounced is the controversy between those trying to minimize pollution of the river to make it bath-able, and those living by the river and releasing faeces into the water as a productive means of composting. The last two chapters of the section both focus on antimicrobial resistance and how they are enacted differently, either because it is difficult to translate simplified global policy norms to the medical practices at the local level in West Africa (Chapter 7) or due to the development of different surveillance programmes for animal health which defined microbes differently depending on regulation purpose (Chapter 8). Together, the chapters illustrate the limits to governing microbes because there is no stable understanding of them to make them easily standardized and regulated. New



regulations of microbes also interact with pre-existing processes of microbe interpretation, sometimes leading to controversies regarding the best regulating practices.

The third section of the book, *Identifying*, focuses on the various ways microbes are classified and categorized as part of broader institutional knowledge production. In Chapter 9, Erickson and Will show how the classification of E.coli varies depending on scientific fields and time, from the original B.coli to E. coli K-12 RLG221. In chapter 10, Davidson (geographer) and Ransom-Jones (microbiologist) discuss how they understand kombucha, finding that multiple perceptions, regulations and practices of kombucha means that it remains without stable meanings and politics. Brieves focuses on the relationship between parasites and hosts, showing how phage therapy is used as an alternative to antibiotics in treating bacterial infections (Chapter 11). Lastly, Butcher attempts to re-evaluate the conceptualization of human-microbial relationships in earlier readings and her own fieldwork. She ends with a discussion of the possibility to 'bacterialise old

ethnography' (p.283) which has not given much importance to the multiple roles of microbes and thereby giving previous theory and findings new purpose. Collectively, these chapters highlight the multiple and changing ways researchers and practitioners are understanding microbes, and in turn, how this influences the way humans relate to microbes.

The rich empirical material in most of the book's chapters is the most significant contribution of *With Microbes*. The authors provide thick descriptions which illustrate very well to the reader how microbes remain fluid objects mediated by devices, knowledges and technologies. While the book's topic and experimental character could have made the book interesting for a more general audience, the theoretical underpinnings of the book still make it most accessible to academics. I would recommend it to STS scholars in general interested in the theories and methods concerning multiple and fluid ontologies, scholars working with microbes, and possibly also policy-makers and managers trying to regulate and device new strategies for being with microbes.

References

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