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Microbial Thinking: A Way of Collaboration

Siyu Li
International Graduate Centre for the Study of Culture (Giessen)

Siyu.Li@gcsc.uni-giessen.de

Abstract:
Gut Anthro: An Experiment in Thinking with Microbes provides an opportunity and case study to bridge the gap between anthropology and human microbial ecology. Through fieldwork in laboratories, Bangladeshi hospitals, and the homes of families, the book gives insight into the connection between microbiomes and race as tangible expressions of society, environment, and biology. Amber Benezra examines how the biological-social disruptions cause problems, as well as the frictions of disciplinary collaboration, to rethink the meaning of relationship.

Mikrobielles Denken: Ein Weg der Zusammenarbeit

German Abstract:
Gut Anthro: An Experiment in Thinking with Microbes bietet eine Gelegenheit und eine Fallstudie, um die Kluft zwischen Anthropologie und menschlicher mikrobieller Ökologie zu überbrücken. Durch Feldforschung in Labors, Krankenhäusern in Bangladesch und bei Familien zu Hause gibt das Buch Einblicke in die Verbindung zwischen Mikrobiomen und *Race* als greifbare Ausdrucksformen von Gesellschaft, Umwelt und Biologie. Amber Benezra untersucht wie biologisch-soziale Störungen Probleme verursachen und wie Reibungen in disziplinärer Zusammenarbeit dazu beiträgt, die Bedeutung von Beziehungen neu zu überdenken.

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Microbial Thinking: A Way of Collaboration

Siyu Li
International Graduate Centre for the Study of Culture (Giessen)

Benezra, Amber: Gut Anthro: An Experiment in Thinking with Microbes. Minneapolis: University of Minnesota Press, 2023. 282 pages, 25 USD. ISBN: 978-1-51-790130-1.

The COVID-19 pandemic has brought the health of the body back into the spotlight, with unprecedented intervention and control of the body through epidemic prevention technologies and policies, yet has reduced the body to data, information, and indicators. The body is also the biological source of the social problems that have plagued us for so long, such as gender, class, and race. As a sociocultural anthropologist, Amber Benezra leads us to follow the microorganisms of the body, attempting to break down the boundaries between the inside and outside of the flesh, allowing us to rethink what it means to be human and what the environment is. This book emphasizes the microbial thinking of commensalism: Whether humans are superorganisms or holobionts or composites of human and microbial selves, we all live in a relationship (cf. p. 17). Therefore, Benezra argues that commensal awareness should also exist in scientific disciplines: "Social scientists can't think of science as a monolith any more than we would think of 'culture' in that way"(p. 86).

Benezra's book is an interweaving of ethnographies ranging from experiments conducted at the Gordon Laboratory at Washington University to collaborative fieldwork done with mothers and children in Bangladesh. She serves as an anthropologist in the lab, contributing ethnographic data to the microbial genomic analysis of severe acute malnutrition in Bangladeshi children. Her research primarily involves interviewing mothers, following them as they cook, clean, and live, and collecting blood, urine, and fecal samples from their children. Back in the lab, she continues to observe the process of DNA and RNA extraction, sequencing runs, and data analysis. She aims to conduct another research project about laboratory ethnography to investigate the methods used by the Gordon Lab in studying microbes, including their perspectives on their work and personal connections to the microbes. By traversing between spaces, she explores the shared biology and social dynamics between humans and microbes. However, the friction of disciplinary collaboration, the disjunction of

disciplinary data, and the inherent difficulty of integrating anthropological information into life science design and data, are pervasive in the book.

Benezra begins her book by discussing the struggles she faced as a researcher and mother. She experienced a miscarriage after conducting fieldwork in Bangladesh. This connects her closely to the encounters of her research subjects, Bangladeshi mothers, to reflect on the relationship between the body, microbes, and the environment. After this rather personal introduction to her research, she also provides an in-depth review of the historical literature on microbes, explaining what they are and what microbiology is. In the first chapter, she raises the issue of collaboration that anthropological information cannot really be included in life science design and data, which also reflects the power hierarchy of the disciplines. For instance, in Science and Technology Studies, the laboratory and the researcher are the objects of study. However, collecting ethnographic data on researchers and their studies can be challenging. As Benezra mentioned, some researchers worry about their privacy and confidentiality, fearing that recording conversations could jeopardize their future scientific careers (p. 35). In contrast, within the realm of sociocultural anthropology, openly revealing the suffering and struggles of the 'other' is a common strategy. Investigators readily engage with their research subjects, especially when they are assigned by a governing agency. In Benezra's own studies, she attempts to steer clear of what she calls "white-anthropologist-out-of-place-in-the-Global-South-babies-and-mothers-on-the-verge-of-making-kinship-charts-ethnography" (p. 14).
However, as mandated by Science studies, she still cannot avoid it, because without collaborating with a scientific partner, access, data, and projects are unattainable (p. 51). Due to the discrepancy in disclosure on the part of her research subjects, those phenomena reflect a hierarchy in which Science is considered superior, White researchers are positioned at the top, and their privacy is to be protected, while people from the Global South are portrayed as legitimate objects of study, with their choice being passive due to the power and resource imbalance.

In chapter 2, Benezra articulates the concept of the microbiome in detail, questions the phenomenon that only microscopic organisms are considered microbes, and poses a question to the reader: What are microbes without microbiology (p. 124)? However, the purpose of Benezra's study is not to provide a definition but to show the imperceptible boundary between the long-established binary oppositions between disciplines and between humans and

nonhumans. In chapter three, she further discusses and asserts that microbes are related and have the ability to shape the environment over generations. For this argument, she relies on the concept of microbiokinship, which describes those interspecies relationships that are not only companionships but also fatal entanglements. In chapter 4, Benezra describes the application of microbiome research to malnutrition in Bangladesh and how scientists are using big data to understand the relationship between human health and malnutrition.

In the final chapter, Benezra examines the connection between microbiomes and race as a tangible expression of society, environment, and biology. She argues that the lack of a sociological perspective on existing racial or ethnic differences in disease, or the association of racial groups with certain diseases, exacerbates prejudice and discrimination against the group, and this structural racism can in turn affect the health of the population. For example, Benezra points out that racial discrimination, chronic stress, and other inequalities can affect the vaginal microbiome and lead to preterm birth (p. 191). Thus, Benezra focuses on how human microbiome research relies on the simple definition of race as a biological or social identifier. She coins "ghost variables" to refer to the racialized terms, such as developed or underdeveloped, used in microbiome research that have political, social, and historical contexts without explicitly naming race (p. 181). These variables show how the concept of the direct impact of the environment on the body has historically been used to naturalize racial hierarchy and inequality. She argues that race cannot be an independent explanatory variable: "If humans are made mostly of microbes, which presumably don't have races, then humans' interspeciality or 'becoming-with' these organisms takes precedence over old racial categories" (p. 178). In her opinion, becoming-with, *sensu* Donna Haraway, requires social science interventions that reflect on the distribution of power and resources, and the social determinants of health must fully address "capitalism, industrialization, environmental injustice, systemic racism, heteropatriarchy, imperialism, settler colonialism, and resource exploitation" (p. 181).

One of the major contributions of this book is that it expands the discussion of racism in microbiome research by looking at differences among microbes through the lens of social science, including factors such as poverty, access to resources, and discrimination. This includes also the neglect of racism in microbiome science and the continued use of racial categories as defining variables in research design and analysis. Even though, with the development of medical and technical life sciences, humans are able to manipulate organs, metabolism, and

enhance life with "next-generation bacterial genome sequencing and formidable computing power," Benezra criticizes that "we seem still trapped in Linnaeus's original race scheme, dividing the world's populations into a four-part color wheel"(p. 188–189).

Microbial thinking is an insightful way to penetrate entities that have been constructed in history. We cannot expect to use 20th century systems of thinking to solve 21st century problems. Although Benezra draws on a large amount of microbiology literature, she explains terms that may be intimidating to non-microbiology scholars. The study of microbial knowledge is also the acquisition of microbial thinking. Life needs a new metabolism if we allow our bodies to respond to different environments, and so do disciplines. For social scientists, this is a book that provides the opportunity to reexamine society and human systems from the perspective of microbes. At the same time, it reminds life scientists to continue to explore the boundaries of life rather than to solidify life. This is what it means for anthropologists to approach sentient beings in order to contribute ethnographic data to life.