

**Stefan Helmreich: Alien Ocean: Anthropological Voyages in Microbial Seas
University of California Press: Berkeley, 2012. 464 pages.**

Stefan Helmreich is interested in oceans. He is also interested in the relation between "life forms" and "forms of life". In this book he traces and describes networks of culture, economy and society which orient themselves around biological life. However, having found himself within a field of scientific research where what counts as biological life is changing, that tracing turns out to be complex. The stories of this book emerge from the effort to produce an anthropological account able to do justice to these shifts as they appear in the practice of marine microbiology, but also to recognise the many forms of collective life in which marine microbes are active participants.

In the second chapter of this text, entitled "dissolving the tree of life", Helmreich offers a general account of a shift in what counts as biological life. Once the scientific study of the oceans was concerned with species such as marine mammals, fish, and seaweed, and their ecologies. These individual species could be isolated and counted, and they could be individually studied and located at a branching evolutionary moment on the tree of life. This genealogical system outlined by Darwin in *On the Origin of Species*, was borrowed from Victorian practices of family recordkeeping and property inheritance, and it had the benefit of revealing continuous lines of descent which were traceable to common ancestors. Darwin read these lines of kinship as the organising structure of the organic world, and this tree image became at once naturalised and universalised (p.77).

Today in the research practices of marine microbiology these same oceans exist (in

addition) as profusions of microbes and extremophiles. Scientists now struggle to classify these microbial organisms. The coherence of the old story is disrupted by the genetic material that these microbes present. This material does not appear as a generation-to-generation form of inheritance; rather these microbes exhibit evidence of lateral gene transfer, and the shuffling of genes back and forth with their contemporaries, as they mix up their own and others' genealogies (p.82). On land this shift in working imaginary occurred several decades ago in the life sciences. It gained impetus with the mapping of the human genome, and was traced as the opening up of new hybrid lives and imploded spatial relations by Donna Haraway (1997). Now in the study of oceans, genetic information is similarly no longer code for the biological specificity of organisms. Rather biological organisms are taken as revealing patterns of contingent digital arrangement, and as this situation becomes re-naturalised as what has always existed, new patterns of inquiry, utility, ownership, trade and engineering also begin to infuse and support these new oceans and emerging natures.

Emerging patterns of practice, capital flow and cultural signification, which ramify around this shift, are what Helmreich describes in rich detail through the pages of his book. In doing so he draws upon the many hours spent with marine microbiologists both on and under the sea, as well as in laboratories and at meetings and conferences. He is able to follow lines of interest and significance through

research projects ranging from the tracking of gene transfer across bacteria living near hydrothermal vents, to the mapping of the ocean's genome, and the prediction of microbial life on Mars. The result is a vast and synthetic account of marine microbiology, which also seeks to show the complexity of its heterogeneous relations, and the lateral transitions and translations that are currently supporting the technoscientific orders of these oceans.

The description of scientific research as heterogeneous, social and technical practices has been a driving theme of much work in STS in recent decades. For his purposes here, Helmreich draws on this work, and uses it, not in the continuation of a task of revealing the scientific as social, but rather to supplement and enrich his anthropological descriptions of a variety of socio-natural imbroglios in which science is an performative participant. This descriptive task presents a unique and troubling challenge for the theorist who would like to do justice to such complex and emerging array of practices. This is a challenge which Helmreich shares with theorists such as Thom Van Dooren and Anna Tsing who are grappling with ways to write entwined webs of being and becoming as multispecies ethnographies. Here, in crafting the figure of the 'alien ocean' as a study subject which he is both working to propose and describe, this book presents a dense narrative pastiche, crowding together the information and experiences of any number of semiotic scales - from the microbial to the science fictive - to call up and present some of the resonances through which materiality, capital, political influence and cultural signification are arising out of and working to enhance the new nature of these oceans.

The story of an hour-long decent to the ocean floor as part of a three-person crew on the research submarine *Alvin*, describes the cramped feeling of the journey as well

as rare vision of hydrothermal vents as they appear through the cameras of the sub. Here, Helmreich ponders on the mediated and also entirely immersed and encompassing quality of the anthropologist's experiences within a medium that is simultaneously their surroundings and their study. He begins to explore transduction as a logic and practice of knowledge making. The blurring of insides and outsides, artifice and environment enabled by the cyborg complex of humans and submarine, is crucial to marine and microbial research. Listening for sounds and feeling for temperatures, the submarine is able to detect information for research and navigation from the waters outside, as well as able to translate them to sounds and readings audible in air and adjusted for by internal atmospheric controls. On this expedition not only are the fluxes of water temperatures and flows being navigated and noted by the sub, but boundaries of national territories and international law are being noted and navigated. Many study sites exist in legally ambiguous areas, in deep ocean areas where natural jurisdictions do not apply. However, as research by bio-prospecting around deep sea vents begins to become more prevalent, these marine resources are beginning to produce and rework relations of property equity and the commons, and to invite questions of UN negotiations around distribution and protection of vent ecologies (p. 245).

Many rich and detailed stories of the mingling hybrid relations of these oceans, and the boundaries which they sometimes disturb, appear in this book. By crafting the notion of 'alien oceans' as a tool and a working metaphor through which the dazzling and also dangerous networks of these oceans may be made visible, Helmreich offers a way to read their performance, and to continue it on in scholarly work. This tool offers a means for the reader to be able to be shocked anew by the wonder of the oceans,

only this time the shock is not in relation to their hidden depths, but the profusion of “forms of life” which they are coming to express. However, while this tool works well to open up an effusive complexity, it doesn’t seem to allow for suggestions of how these processes may be appreciated, and perhaps intervened in, as a politics. We as readers become open anew to envisioning wonder, but then we are left with the possibilities of a politics inherited from a time firmly located in assumptions of biological individualism. While emergence from one working imaginary to another seems to be possible in the practices of scientific research, it has not yet been accomplished the social science texts which re-tell those practices.

As an evocative and exploratory narration of the social, political and economic life

of a nature that no longer complies with the spatial and temporal assumptions of evolutionary biology, this book grapples with how we might think through and tell stories about a new and emerging nature. In doing so it is of interest to scholars in anthropology of science and STS, as well as other disciplines where research involves the challenges of engaging different and emergent natures. It brings to life the challenge to craft new, and adapt existing, methodological tools and sensibilities to assist with such complex and embodied research.

Michaela Spencer
History and Philosophy of Science
University of Melbourne
mlsp@unimelb.edu.au