

## **Lively Capital: Biotechnologies, Ethics, and Governance in Global Markets**

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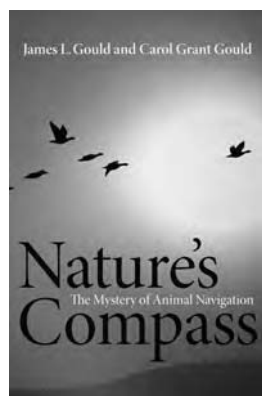
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orientation strategies, such as maintaining constant bearings relative to a cue, vector navigating, piloting, and inertial navigation—all of which require some sort of precise timing ability—in order to migrate. The remaining chapters then reveal how animals employ similar but often very different means from humans' nautical approach to establishing their positions and discuss the wide range of available backup strategies, should any cue fail.



Appropriately, much attention is given to how honeybees and homing pigeons have solved navigation problems in different ways. Although the two species are the familiar “lab rats” of navigation research, I found the book’s material to be fresh, up to date, and more interesting than previous popular treatments. In *Nature’s Compass*, we go well beyond the “waggle dance” and discover how bees must keep track of and compensate for crosswinds and a moving sun and how pigeons possess the equivalent of an internal global positioning system. Examples from a large array of taxa are used to introduce key concepts, including how magnetic maps, polarized light, and even olfactory cues facilitate navigation. The book is well illustrated with numerous figures and diagrams that are essential to understanding the often-complex material.

Interestingly, the book concludes with a discussion of how stressors, such as global climate change and

anthropogenic habitat loss and deterioration, can influence migratory species and ultimately disrupt their movements. Migratory species have evolved to be less phenotypically specialized than residents, and there is evidence for greater adaptation to changing climates by migrants through changes in migratory and breeding phenology. The Goulds argue that a more serious threat to migratory species is the loss of habitat they are experiencing throughout their annual cycles. Because of this, a species that may enjoy a protected breeding habitat may be nonetheless threatened by the destruction of its wintering or stopover habitat. Although the link between habitat loss and the general topic of animal navigation may seem tenuous, this last chapter nicely bridges the concepts of the speed of evolution of new migratory behaviors and the adaptation (or lack thereof) to new cues. Understanding how animals migrate may also help our efforts to conserve them.

I found few faults with *Nature’s Compass* but would have preferred direct citations or footnotes within each chapter to reference key points. Instead, the authors opted for a general bibliography, by chapter, at the end of the book. This undoubtedly makes for a smoother presentation but may irritate the more serious student. I also found it curious that the authors mostly limited their book to imperial units of measure, with just an occasional smattering of metric. Adherence to metric units would have been more internationally and scientifically appealing. However, these are minor quibbles and do not detract from the Goulds’ impressive encapsulation of the many facets of animal navigation.

I anticipate that this book will become an essential part of the collection of anyone seriously interested in animal navigation, and I imagine that it could readily serve as an important supplementary text in an undergraduate-level course on the topic. The reader will be left humbled by the complex and sophisticated ways

in which other animals establish their location in relation to their destination—a stark contrast to our own poor innate abilities.

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### AN INTERDISCIPLINARY APPROACH TO UNDERSTANDING MARKET-DRIVEN SCIENCE

**Lively Capital: Biotechnologies, Ethics, and Governance in Global Markets.** Kaushik Sunder Rajan, ed. Duke University Press, 2012. 528 pp., illus. \$29.95 (ISBN 9780822348313 paper).

The edited volume *Lively Capital: Biotechnologies, Ethics, and Governance in Global Markets* is the primary output of a process that began in 2004 with a workshop of the same name, held at the University of California, Irvine. Amassing an interdisciplinary group of scholars (i.e., African studies, anthropology, comparative literature, history of consciousness, public policy, rhetoric, science and technology studies, and sociology), the workshop examined how new legal, social, cultural, and institutional mechanisms were emerging to regulate nascent biotechnologies. It is these broad areas of inquiry that constitute the relationship between conceptions of biotechnology and the market, and it is this relationship that is the focus of the book.

*Lively Capital* begins with a brief summary of the historical and sociological processes by which the life sciences—and biotechnology, in particular—have become increasingly commercialized, most notably in university settings. Universities in the United States have set a historic precedent for commercializing the process of biotechnology

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research, which has made the actual scientific discovery process more responsive to the pull and influence of market forces. However, differences in approach among these institutions reveal a certain level of plasticity in how emerging biotechnologies are integrated into systems that generate social value, such as intellectual property regimes.

The book raises questions about the nature of these processes and about the effects that scientific and market systems have on each other. On one level, *Lively Capital* focuses on the developing global response to the emergence of biotechnologies—a discussion involving rational questions about monetary value and risk, as well as more emotionally charged questions about science and technology, which “impinge on experiences of embodiment, kinship, identity, disability, citizenship, accumulation, or dispossession” (p. 16). On another level, the book reflects on the philosophical questions of how to make sense of this science–market relationship. In this respect, the work focuses on discovering trends and on how scholars have attempted to study the ways in which this relationship is negotiated and experienced.

Editor Kaushik Sunder Rajan argues that the “theoretical question at the heart of this volume is not to come up with the *theory* of life or capital or governance or globalization or markets or neoliberalism, but it is rather to come up with *forms of inquiry* that are adequate to studying a contemporary conjuncture of the life sciences and capital” (p. 23). He also expresses a desire to facilitate continued exchanges among these forms of inquiry—a collaboration that is often thwarted by disciplinary divides. To Rajan’s credit, a convincing argument is made that the issues surrounding the science–market relationship can be satisfactorily addressed by interdisciplinary research, which reaches beyond the standard epistemological and methodological boundaries of established forms of inquiry.

To this end, the book showcases diverse approaches from the social sciences and humanities and includes topics such as environmental politics, the ethics of biomedical technologies, intellectual property law, and experimental epistemology of life science research. The methodological approach adopted by each contributor is qualitative in nature and relies heavily on detailed descriptions of case studies as diverse as the historical commodification of dogs and the promise of new biomedical interventions for autism. The terminology, tone, and style of each essay is quite distinct. As a result, the book does not lend itself well to a cover-to-cover reading. However, each piece of research provides a stimulating account of intellectual inquiry.



Viewed as a whole, the volume has been thoughtfully edited to balance the need for conceptual structure with a sensitivity to the diverse approaches of the contributing authors. Rajan’s contributions give the reader a solid conceptual grounding—no mean feat, considering the compounding effects of epistemological and methodological pluralism. The editor’s commentary enables the contributors, many of whom are world renowned in their fields, to engage in analysis in a way that is not overly formulaic or confined to surface-level examination.

The editorial presentation of *Lively Capital* will not appeal to those who seek clear-cut solutions to the philosophical and political problems raised by the commercialization of the life sciences. Equally obtuse are the conclusions about the nature and trajectories of the

relationship between the practice of life science research and market-driven values. Despite this, Rajan nevertheless manages to provide a concise analysis of the book’s contributions in its closing section. He breaks them down into three interrelated forms of inquiry: (1) Empirical: In what ways are these new conjunctures of science and capital forcing us to recalibrate our “vocabulary of social theory that we have inherited”? (2) Methodological: How do we make sense of what we see and convey our understanding to others? And (3) political: What larger ramifications will “these empirical and conceptual interventions” have? (pp. 437–438). This work, then, is as much about the *study* of the commodification of biotechnology as it is about the actual commodification of biotechnology.

In many ways, *Lively Capital* reflects both the challenges and the benefits of adopting an interdisciplinary approach to researching an issue. As a result, the book provides a thought-provoking read for those with an interest in the processes of commodification and in the politics of emerging bioeconomies.

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## NEW TITLES

**Bankrupting Nature: Denying Our Planetary Boundaries.** Anders Wijkman and Johan Rockström. Taylor and Francis (Routledge), 2012. 224 pp., illus. \$44.95 (ISBN 9780415539692 cloth).

**Chasing Doctor Dolittle: Learning the Language of Animals.** Con Slobodchikoff. Macmillan (St. Martin’s),

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