A Bazaar Concept

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Source: BioScience, 59(5) : 444-445

Published By: American Institute of Biological Sciences

URL: https://doi.org/10.1525/bio.2009.59.5.15

and positive indirect effects of competition. Chapter 4 reviews the context for interactions between competition and facilitation and how their relative roles may change along productivity-stress gradients. Although Callaway consistently views the world through the lens of facilitation, the presentation is quite evenly balanced. Competition gets fair mention, experimental deficiencies are acknowledged in many of the case studies, and areas for further research are frequently noted.

Chapter 5 is one of the most important in the book because it details a number of studies that clearly document direct species-specific positive interactions. This and the previous chapter present the core evidence for positive interactions, as well as the environmental contexts in which either positive or negative interactions will most likely predominate. In chapter 6, Callaway integrates the role of positive interactions into several broader conceptual areas, including the diversity-productivity relationship, diversity-stability models, conservation ecology, species invasions, and the individualistic hypothesis. For the most part, this chapter successfully embeds positive interactions into a number of current areas of inquiry.

Conceptual context is particularly relevant for the author's goal of stimulating new thinking about the individualistic hypothesis. Callaway contends that if there is a substantial number of species-specific positive interactions in nature, then plant communities are far more integrated than most ecologists care to admit. To some extent this premise is based on an admittedly extremist view of the individualistic hypothesis, one that views species associations as more the product of chance and environmental sorting than interspecific interactions. In that regard, the historical focus on competition in plant communities is sufficient to dispel the noninteractive maxim of the individualistic hypothesis.

My own viewpoint is that the individualistic hypothesis has always had species interactions at the core, primarily interspecific competition, and therefore this hypothesis is based fundamentally on interspecific interactions. It is likely, however, that the direction and strength of species interactions vary among participants in a community and that distributions are spatially hierarchical. What this volume does is highlight the key role of positive interactions that cause greater integration among species within communities, without taking us back to the untenable holistic community concept.

As Callaway points out, what is needed now is a conceptual model that incorporates positive, neutral, and negative interspecific interactions, and an understanding of how those interactions vary along environmental gradients, to explain pattern and process in plant communities. Indeed, neither the community-unit nor the continuum concept (a product of the individualist distribution of species) effectively describes actual community structure along gradients, and these models fall far short of incorporating the full suite of mechanisms that create gradient structure. Thus, I think that Callaway's desire to stimulate conceptual advances in community ecology is commendable, and I am encouraged by the recent resurgence in thinking about models and mechanisms in plant community ecology.

The book closes with an astonishing 77 pages of references, which, at an average of around 14 citations per page, would be a massive EndNote file of approximately 1070 references. For the most part, *Positive Interactions and Interdependence in Plant Communities* is very readable and interesting, but the volume is riddled with a number of typographical errors, a function of poor copyediting and proofreading. The list price for the hardback version is $249, and at that cost I would expect flawless production. Despite that minor annoyance, the book is a detailed, comprehensive treatise on positive interactions in plant communities that will be of particular interest not only to plant ecologists but also to those ecologists involved with environmental restoration and management. Callaway's book is a fabulous resource and it contains much food for thought and lively discussion.

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A BAZAAR CONCEPT

Biobazaar: The Open Source Revolution and Biotechnology. Janet Hope. Harvard University Press, 2008. 448 pp., illus. $27.95 (ISBN 9780674026353 cloth).

From the early 1980s, the implications of including biotechnological innovations within current intellectual property (IP) systems have attracted increasing attention and concern, especially since the internationalization of these systems under the World Trade Organization in 1995. Flaws in the current system have been recognized, particularly regarding its negative effects on access both to the products of innovation (e.g., essential medicines) and to the scientific information and knowledge on which they are based. We now need to construct viable alternative models of innovation management that are able to coexist with IP law, a point strongly argued in *Toward a New Era of Intellectual Property: From Confrontation to Negotiation* (*www.theinnovationpartnership.org/en/ieg/report/;* see also Beardsley 2008).

Janet Hope, of the Australia National University Center for Governance of Knowledge and Development, presents one possible model in *Biobazaar: The Open Source Revolution and Biotechnology.* Hope, who has worked for several years on open-source biotechnology, covers complex conceptual and theoretical ground, but I urge the nonspecialist not to be put off—the exploration of alternatives to the current system of innovation management is an important topic, and general readers will have a

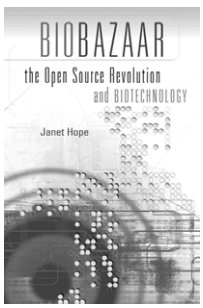
doi:10.1525/bio.2009.59.5.15

good overview of the issues and problems involved in this endeavor when they finish this book.

Biobazaar examines some of the pitfalls of existing intellectual property protection systems for biotechnology innovation and presents its potential alternative—the "biobazaar" open-source model, based loosely on the open-source software concept—alongside assessments of the suitability of such models for the biotechnology area. It provides a thorough outline of concepts and theories on the relationship of intellectual property rights to biotechnological innovations, of the advantages and disadvantages of various management systems, and the (limited) potential for constructing alternatives that are less obstructive to the flow of information.

Logically starting from an assessment of the problematic and troubled relationship between IP protection and (biotechnological) innovation, Hope makes good use of examples from both the pharmaceutical and agricultural sectors of the biotechnology industry, giving justified attention to global dynamics and to the distinct impacts of global innovation systems on developing countries. The analysis supplies clear motivations for examining alternatives to proprietary tools for managing biotechnological innovation. The rest of the book deals with open-source biotechnology—what it is and what its potential is in the biotechnology arena—and introduces the biobazaar model, which is based on the concept of "bazaar production." Bazaar production, as Hope explains on pages 108–111, is a label used to describe the production model that organizes activities in open-source software, a model characterized by nonhierarchical participation, open membership, users as innovators, and "spontaneous, decentralized ordering of transactions" through open information on the model's subject matter (p. 109). The book remains realistic about the limitations and disadvantages of open-source projects.

The concepts and theories covered in the book are often useful, but at times they are too much for a nonspecialist to absorb and were confusing when presented in rapid succession. Persistence is worthwhile, however: the author makes clear, compelling arguments about current problems and potential alternatives, without avoiding the difficult



questions regarding the practical realities of mainstreaming such alternatives. To achieve a more ordered line of argument, I suggest readers work through chapters 1, 2, 3, 5, and 7, followed by 4, 6, and 8; this provides a better flow from the background on biotechnology innovation, through general information on open-source, to more specific information and the biobazaar concept. Given the book's appeal to a wide range of audiences (including scientists, innovators, regulators, and those more broadly interested in the impacts of the governance of innovation), I would suggest that any future editions include a glossary of technical (i.e., scientific and IP) terms.

Biobazaar gives the necessary warnings about the implications of the current system for socially valuable innovations, while being realistic about the possibility of changing the system in the short term. The book does not neglect to recognize the important role IP rights have played in the development of the biotechnology industry, but also notes that they have obstructed certain paths of innovation. Any open-source model will need to take biosecurity controls into account because a major concern of the biosecurity community is the risk of misuse of openly accessible biological information with dual-use potential—gene sequencing information for pathogens, for example (NSABB 2006). That this is not addressed in *Biobazaar* is understandable, given the book's more technical focus on innovation models, but it would need to be addressed if the biobazaar model is put into practice.

There is a brief discussion (in chapter 2) of science having been, for a few centuries at least, a fundamentally open-source endeavor. This discussion could have usefully been expanded: that the open nature of science is threatened by current IP systems is something that demands further attention.

The book gives timely coverage to many of the problems found as the existing systems of innovation management are applied to biotechnology. The demand for improvements to the current patent system and for well-constructed alternative models is reaching a crucial stage. *Biobazaar* not only contains details of its own alternative model but also presents valuable information on open-source models in general and further reflection on the adaptations needed to move from open-source for software to open-source for the biotechnology industry.

I hope to see many others follow Janet Hope's example in presenting potential innovation models that will, in her words, "provide an alternative to the use of proprietary tools—a toolkit for biotechnology innovation that is affordable, accessible, and unencumbered." In this way, biotechnology may come closer to fully meeting its beneficial potential.

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References cited

Beardsley TM. 2008. Preventing Patent Purgatory. BioScience 58: 907.

[NSABB] National Science Advisory Board for Biosecurity. 2006. Addressing Biosecurity Concerns Related to the Synthesis of Select Agents. (13 March 2009; *http://oba.od.nih.gov/biosecurity/pdf/final_NSABB_Report_on_Synthetic_Genomics.pdf*)