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Book Review

Dicks, H. (2022). **The Biomimicry Revolution: Learning from Nature How to Inhabit the Earth.** Columbia University Press.

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In contrast to the philosophy of technology of the late 19th and early 20th centuries, where it was deemed important to move away from a dominant definition of technology as an imitation of nature, attitudes toward this old idea have again become more receptive in recent decades, and not least within the framework of biomimicry. In a narrow sense, biomimicry refers to a type of engineering that strives to replicate natural objects and processes in technological realms, serving as a strategy for technological innovation, often (but not necessarily) with an in-built orientation to sustainability. The foundations for a vision of biomimetic technology were established by Janine Benyus in her book *Biomimicry: Innovation Inspired by Nature* (1998), which laid the groundwork for the subsequent development of this field. Since then, biomimicry has found applications in a range of fields, including architecture, product design, transportation, energy, and materials science. Notable examples include the Eastgate Centre in Zimbabwe, inspired by termite mounds, which utilizes passive cooling techniques to regulate temperature without conventional air conditioning systems, as well as Velcro, the development of which was inspired by the mechanism of burrs sticking to clothing.

Despite its groundbreaking nature, Benyus did not fully explore the implications of her vision for philosophy in a broader sense. In his book *The Biomimicry Revolution: Learning from Nature How to Inhabit the Earth*, philosopher of technology Henry Dicks undertakes this challenge. Approaching the subject with conceptual rigor, his primary objective is to present, analyze, and explore the philosophical foundations and aspects of Benyus' original vision that have remained largely unarticulated. In essence, Dicks argues that Benyus ultimately presented not just an engineering protocol but a new philosophy. He characterizes biomimicry as not only a technological revolution, comparable in scope and scale to the industrial revolution, but as a potentially broader revolution in our thinking and existence. Specifically, Dicks perceives biomimicry as a distinct philosophy in its own right, rather than merely an *object* for philosophical inquiry (as would be implicated by the "philosophy of biomimicry" or some such endeavor).

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In the opening chapter that sets the tone for subsequent conceptual explorations, Dicks re-interprets Kant's third critique of judgment as concerning *Technics*, encompassing both 'natural technics' and 'human technics' (i.e., arts and technology). In particular, Dicks makes a noteworthy contribution to environmental thinking by his differentiation between physis, techne, and science. With skillful clarity, he defines *physis* as self-producing and autopoietic nature, *techne* as products created by humans, and science (and this is his significant contribution) as a means of bringing into relief and delimitation, without being constructed by it (e.g., atoms, organs belonging to a larger organism). This tripartite ontological differentiation – and specifically the elaboration of nature as physis by which he dodges the Scylla of dualism and the Charybdis of monism – then forms the foundation for Dicks' biomimetic philosophy, viewing nature as a model, measure, and mentor.

Nature as Physis: Model, Measure, and Mentor

Dicks proposes that we adopt a biomimetic orientation toward nature as a model, measure, and mentor, which correspond to biomimetic technics, ethics, and epistemology, respectively. In essence, taking nature as a model involves drawing inspiration from natural technics for human technics, while approaching it as a measure entails applying ecological standards derived from Gaia within the ethical domain of human actions. In designating the third aspect of nature as an epistemological mentor, Dicks reiterates the common rationale and creed of biomimicry: we are not relinquishing our autonomy to nature, but merely recognizing that "over the course of 3.8 billion years of evolution, nature has accumulated a wealth of knowledge, experience, and wisdom that we can ill afford to ignore" (p. 253). Central to Dicks' vision is his concept of enlightened naturalism – bound to raise some posthuman eyebrows, as it associates being with nature (thus embracing naturalism), yet incorporates an "enlightened" perspective that attaches the ontological human exceptionalism to our ability to "understand what and that beings 'are'".

The biomimetic perspective acknowledges nature as a model, measure, and mentor; however, it is primarily from living systems, whether physical (atoms, vortices, stars), biological (organisms, societies, species), or ecological (Gaia itself), that any imitable traits can be derived (p. 91). Both the level of traits specific to some natural being and the level of more general and abstract traits can be utilized. Examples of imitable traits, thus, include 1) the natural forms, 2) materials composing natural systems, 3) the generative processes that give rise to them, and 4) the functions they perform. Again, Dicks emphasizes that his objective extends beyond merely increasing the number of biomimetic innovations or products; instead, he seeks a more comprehensive transformation of our artifacts to overcome their inherent dissimilarity from natural entities (p. 139). This also implies that analogy and simile alone are unlikely to play a significant role in the biomimicry revolution, as what is needed is not a mere amplification of existing similarities between natural and artificial entities.

In many instances, Dicks demonstrates a remarkable ability to navigate unexplored conceptual terrains, which have not been thoroughly examined, guided primarily by his biomimetic principles. An illustrative example of his approach can be found in his chapter on ethics, where he neatly categorizes different branches of environmental ethics, demonstrates their interrelationships, and sheds new light on previously undervalued areas. Dicks defines environmental ethics as the field that traditionally concerns itself with the moral *object* of environmental action. Environmental virtue ethics, on the other hand, focuses on the agents

and *subjects* of environmental action. Lastly, environmental action ethics – and this is the heretofore underexplored branch – emphasizes environmental practices, namely preservation, conservation, and restoration. In summary, Dicks argues that biomimetic ethics can be understood as an environmental ethic that governs the human-nature relationship, encompassing the effectiveness, appropriateness, and sustainability of our technological endeavors (p. 159).

New Enlightenment, New Autonomy

> When nature does things for us, we remain *dependent* on nature, but when nature shows us how to do things, we gain a measure of *autonomy* from nature. (p. 254.)

Describing his treatise as the long-overdue expansion and consolidation of Benyus' initial "embryonic collection of principles and insights" (p. 250) into a comprehensive and internally consistent philosophical system, Dicks' book presents an impressive conceptual framework for biomimetic thinking, covering the ontology, technics, ethics, and epistemology of biomimicry. Not only does the book provide detailed and valuable elucidations of the interrelationships between our notions of nature as physis, techne as human production, and science as conceptual or discursive delimitation, Dicks argues that what is ultimately needed is a new enlightenment and a concomitant human autonomy that he envisions could emerge from a biomimetically inspired reevaluation of our relationship with nature. Drawing inspiration from Kant once again, Dicks suggests that the path to autonomy lies in cultivating a willingness to learn from nature while acknowledging our dependence on it (p. 255).

While admiring the expansive (if not lofty) conceptual scope and breadth of his ideas, as a cultural researcher, I find it pertinent to also consider the social and political implications of Dicks' profound treatise on technologized nature. Specifically, I am interested in exploring how our tendency to naturalize cultural categories, technologies, and objects intersects with the discourse of technologized and scientized nature. In this context, science and technology are often simultaneously naturalized, and it becomes the role of the critic to again re-politicize them. Also, what are the political-ecological stakes in privatizing nature as intellectual property or resource for innovation in industrial engineering (Goldstein & Johnson, 2015)? In other words, biomimicry can serve as a powerful discursive tool and social imaginary that can be instrumentally employed to legitimize certain social, technological, and political practices. Consequently, what would be an appropriate form of critique toward biomimicry, one that would remain sensitive to the discursive misuses of nature while still acknowledging its inherent wisdom as physis?

References

Goldstein, Jesse & Johnson, Elizabeth (2015). Biomimicry: New Natures, New Enclosures. *Theory, Culture & Society* 32(1), 61–81.