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Review: *Alternative Pathways in Science and Industry. Activism, innovation, and the environment in an era of globalization*

By David J. Hess

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David J. Hess, *Alternative Pathways in Science and Industry. Activism, innovation, and the environment in an era of globalization*, The MIT Press 2007, IX+334 pp., US\$ 25, ISBN-13: 978-0-262-58272-8 (Paperback), Alkaline paper

David J. Hess is a professor in Rensselaer's Department of Science and Technology Studies (Troy, NY) and director of the program in Ecological Economics, Values, and Policy. He is a longtime leader in his field; his previous books, like "Science and Technology in a Multicultural World" (1995), and "Science Studies: An Advanced Introduction" (1997), provide a thorough assessment of the impact of science and technology in various social settings. His most recent title, "Alternative Pathways in Science and Industry", examines how social movements and other forms of activism can affect innovation in science, technology, and industry, rather than merely opposing them.

Hess identifies three major traditions in social theory: the universalism of standards and values (along with the increasing pervasiveness of normative systems); the increase in social differentiation and the challenge of societal integration; and the Marxist tradition, i.e. the expansion of scale politics and economies based on accumulation processes and colonization of smaller-scale societies. In conventional analyses, the mainstream pathways are the networks that control major research departments, run academic societies, and support those technologies and products put on the market by the leading corporations. The alternative pathways, by contrast, are often connected with movements struggling to resist the endangerments of the market on a global scale and challenging governments and corporations to attain a more equitable distribution of economic and political rights and resources. While traditional social theories and conventional analyses regularly clarify the limits of the existing trends, they lack the means to overcome in practice the current crisis of the environment and globalization. Alternative pathways, on the other hand, frequently originate just as solving-problem agencies. They embody disagreements over mainstream methods and conceptual frameworks (such as the antinuclear energy movement), and express differences over which agendas best match the broad public interest. But they do not include only opposition and social-change goals; in some cases they mix social-change ambition with profitability goals, being more product-oriented, as the renewable energy movement (Ch. IV, "Technology and Product-Oriented Movements"). Alternatives in either case emerge when the dominant societal directions lose credibility and new dimensions have to be integrated. "The alternative pathways" - Hess explains - "have emerged in the interstices of a world in which people see their communities, democratic institutions, jobs, material culture, and personal relationships being uprooted by distant economic and political institutions that seem unresponsive to their needs" (p. 15). Their repertoires of action typically include the use of extra-institutional strategies, although they sometimes get government funding: in science, for example, while their research budgets are comparatively small, they work with institutions in such fields as natural medicine, organic food and agriculture, green chemistry, and solar energy. Although industry may at first ignore or discourage

these grassroots innovations, at some point they tend to take up their challenges, possibly reworking them. Hess' theoretical argument (Ch. I, "Retheorizing Scientific Change") and the empirical evidence he presents (Ch. II, "Science in an Era of Globalization") demonstrate the plexus of incorporation and transformation that characterizes the relationship between industry and activism. Dangers exist, like the "passive revolutions" that take place when alternative technologies carve out new markets and are then absorbed into the dominant stream, with no cultural change and little popular participation. But Hess proposes a plethora of scientific and technological opportunities to merge the roles of industry and grassroots consumers in setting new research agendas. Major reforms can be undertaken, e.g. in agriculture (food cooperatives), energy (alternative-energy producers), waste and manufacturing (community-based recyclers), infrastructure, and finance (Ch. VI, "The Localization of Activism and Innovation"), in order to identify more just and sustainable pathways of "opposition and compromise". His main suggestion is that the creation of new technologies and products can be one platform for activist politics.

The book is written in very accessible language; although the focus is almost exclusively on the United States, it will be useful to all those activists and professionals concerned with the co-evolution of science, technology, society and the environment.

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