

Book Reviews

Alternative pathways in science and industry: activism, innovation, and the environment in an era of globalization

David J. Hess

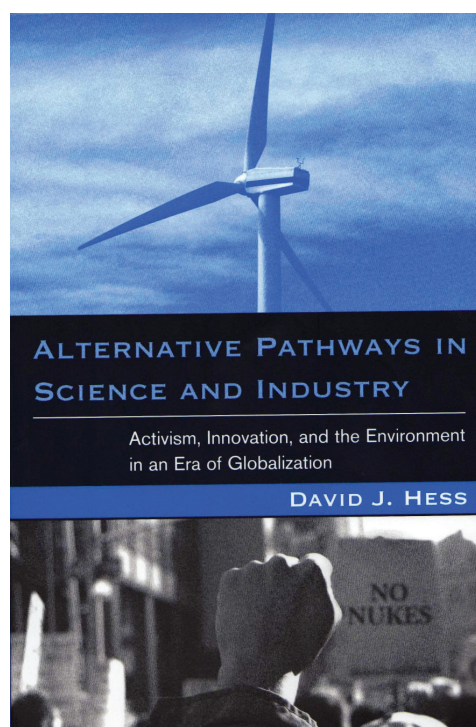
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“This book concerns concessions” (p. 1); thus David J. Hess describes his latest work, *Alternative Pathways in Science and Industry*. The book, resulting from a huge effort of synthesis, deals with social movements that attempt to influence decisions in different areas; including nuclear energy, organic food production, urban design and popular credit. Thanks to the quantity and diversity of the described experiences, this work will be of interest to a wide range of people, specifically those involved in the debate on social movements, environment, science and technology, and communitarian development.

Hess works in the Rensselaer Polytechnic Institute in New York, where he is a professor at the Department of Science and Technology Studies, and the director of the Ecological Economics, Values and Policy Program. He has a Masters Degree and Doctorate in Anthropology as well as a degree in Economics. With his knowledge of anthropology, he utilises an anthropologic perspective in his research in order to evaluate the influence of cultural aspects on scientific and technological development. His lines of research include the relation of science and technology with the fields of health and the environment. In the area of health, he developed ethnographic and historical research regarding alternative and complementary therapies. In the decades of 1980 and 1990, he was in Brazil carrying out research on the relation between Kardecism, the State, the Catholic Church and practicing doctors. Afterwards, he returned his focus to political aspects and scientific movements linked to alternative medicine, principally its relation with food and



*Cambridge, Massachusetts:
The MIT Press, 2007. 334p.*

the local economy. In this way, he was able to unite his health research with his interests in the environmental area where, for some years, he researched social issues regarding local development and social ventures.

Hess uses a descriptive and analytical perspective throughout almost the entire book, and propounds to explain the dynamic complex of information flows and influences between social movements and scientific and technological changes. The author pieces together historical and comparative analyses of experiences that took place in the USA, and looks to identify the differences and similarities between diverse *alternative ways* oriented at the environment and the local development. By *alternative ways*, he means various actions that occur, diluted in day to day society, such as domestic tasks, leisure activities, life style changes, consumption, scientific research and innovation and creation of new businesses. When adopting this term, Hess looks to extend the empirical base of his research beyond the actions developed by NGOs, also looking at individuals, class associations, militant networks, universities and businesses. The author identifies the main transformations by which these *alternative ways* pass, including agreements and concessions on their objectives, as well as their incorporation by the economic system. At the end of the book, he makes some proposals and suggests strategies for current society to become more sustainable and just.

One of the book's strong points is its diversity, not only in the themes covered, but also in their theoretical references. From a conceptual point of view, Hess casts a hand over different disciplines of social sciences including history, ethnography, sociology, social anthropology, political science, ethics and philosophy. As the book covers a wide variety of subjects and utilises knowledge from different areas, it can be recommended as a good first contact for people who want to better understand the dynamics between social changes and scientific and technological innovations.

Another positive feature of this work is the way in which the concepts are presented. The author shows great concern for the reader, writing in a simple and direct way, and explaining well his principal ideas and resultant presuppositions, as well as being an easy and pleasurable read. The original version in English does not demand a profound knowledge of the language in order to be understood.

The book consists of a general introduction and seven chapters, constructed from three main presuppositions and from the arguments resulting from them. The introduction is very direct; in it the author presents a good summary of the book, some definitions, the methodology utilised and, furthermore, some of the limitations of his work. After this first contact, it is already possible for the reader to have a good notion of what to expect from the book.

Hess's principal presupposition is that a change in the way science is done exists. He contends that the scientific community is less closed unto itself, and is opening its research agenda to the influence of businesses, social

movements and financiers. Throughout chapters one, two, and three, he argues that social theories regarding scientific and technological changes must adapt and create theoretical models that incorporate the role of these new agents.

In chapters four, five, and six, Hess follows the same inductive logic, firstly describing concrete cases, later stopping to present his synthesis and, afterwards, elaborating some theories and generalisations. Furthermore, in these chapters, the author always takes care to deal with the same sectors of the economy: (1) food and agriculture, (2) energy, (3) waste and industry, (4) urban infrastructure and (5) finances.

In chapter one, the author argues how changes in the scientific field occur. He criticises established theories based solely on the cognitive process of scientists and considers that new theories must be capable of explaining the influence of financiers on the selection of knowledge. For Hess, the crucial question for the "garden of science" is to understand "who decides which plants should grow" (p.21). In this sense, the author comments about the "problem of non made science" and does not question the myth of scientific autonomy, once he identifies that autonomy in the scientific field is precarious.

In the following chapter, Hess continues the discussion regarding current changes in the form of doing science. This chapter begins with a description of how science has come to adjust to neoliberal ideology; this adaptation is illustrated by the increase in control of the work of scientists by university bureaucrats, the creation of specific offices for technology transfer by universities to businesses, and the substitution of academic departments for research centres. In contraposition to this tendency, the author describes the *epistemic modernisation*, and under this classification he includes a series of initiatives. As examples of this process of modernisation, he cites *science shops* (an experience initiated in the Netherlands in the 1970s, in which universities opened up their laboratories to the requirements of citizens¹), experiences of research-action and participant research (where the researcher looks at the population not as a research object, but as subjects of one knowledge²), and the common epidemiology (that presupposes that laypeople can question data quality, analysis methods and the standards adopted by scientists³).

Throughout chapter three, the author speaks exclusively of science and deepens the debate on technological solutions. At the start of the chapter, he criticises the paradigm of efficiency, which would consider change of technology as an independent mechanism with its own internal dynamic. For Hess, the measure of the efficiency of a technology would be constructed from criteria defined in economic policy and between organisations, inventors, financiers and users.

Furthermore, in this chapter, the author presents the concepts *technological fields* (systems that satisfy social needs) and of *conflict objects* (products or services that would look to occupy niches inside a technological field). For example, Hess understands that inside of the

technological field of urban transport, the various types of public transport (subway, train, bus); non-motorised transport (bicycles and pedestrians walkways); and individual motorised transport (vehicles powered by different fuels) would compete or complement.

These two concepts are used in the following chapters to argue how *alternative ways* come to hinder the undesirable development of environmental technologies (chapter four), to stimulate technological solutions that could positively contribute to the environment (chapter five), and to favour the local economy or socially excluded groups (chapter six). In these last three chapters, the author evaluates the historical evolution of *alternative ways*, emphasising their transformation, co-option and incorporation standards by the economic system.

In order to rationalise chapters four and five, Hess uses his second principal presupposition and affirms that social movements have enlarged the targets of mobilisations and pressures, not only focussing on government, but also looking to directly influence corporations and businesses. This change of objective would also have been followed by modifications in the strategies of the social movements that, instead of limiting the action of opposition, would resort to proposals and cooperative actions. This observation serves as a base for the author to argue that theories of social movements would have, then, to describe which ways adopting values by these movements has influenced consumption, entrepreneurs and technological innovation. In these two chapters, Hess seems to present a re-reading of the theory of Ecological Modernisation. This theory, which emerged in the 80s and 90s, considers that governmental organisations, enterprising innovators, consumers, creditors and insurance companies, among others, would emerge as forces for a socioecological transformation, based, principally on the incorporation of environmental values in production and consumption⁴. Hess comes to make a brief reference to the theory of Ecological Modernisation; however he does not seem to understand how intensely this theory influences his work.

As previously mentioned, chapter four describes the *alternative ways* that look to block technologies considered undesirable from the environmental point of view, or what Hess calls Industrial Opposition Movements (IOM). In this chapter, he describes the historical evolution of a series of initiatives, such as movements that call for an end to the use of pesticides, the moratorium on nuclear energy and campaigns opposing highways and urban sprawl. Although it is a sufficiently inclusive and descriptive chapter, there are moments when it lacks thorough scrutiny of some subjects. For example, the author mentions changes in environmental policies that would leave them based only on command and control actions, using market instruments more frequently; however, he doesn't present any reflection on the motivations behind these changes.

Complementing chapter four, the following chapter deals with the *Technology and Product oriented Movements* (TPM), that is, those groups that try to encourage

the development and use of environmentally adjusted technologies. In this chapter, the author deals with, for example, the movements that look to promote food production, the use of wind energy, and urban planning based on *New Urbanism*. Throughout this chapter, Hess notes the difficulty of consolidating TPMs alone and suggests that when alternative technologies are able to overcome obstacles created by existing technologies, they end up being adapted and incorporated by sectors and businesses already established in the market.

When dividing the *alternative ways* into IOMs and TPMs, Hess opted for a risky strategy, therefore, despite this division being sensible from the theoretical point of view; it is difficult to be verified in reality. As the author himself admits, in practice "IOMs need TPMs to legitimise their demands for moratoriums, in return, TPMs support alternatives that will be able to substitute the technologies they wish to interrupt" (p.88), being thus, the two types of movements "presuppose the existence of the other and are separable only as analytical categories" (p.118). Due to the difficulty of proving the division between IOMs and TPMs in the real world, the theoretical model ends up being weakened.

Based on the discussion regarding *alternative ways* created by environmental motivations, Hess debates the question of local development. Chapter six is based on his last principal presupposition; that the related social changes in globalisation would have created a countermovement; *localisation*. Using this observation as a base, he argues that the new theories would also have to recognise and look to understand the emergence of this movement. In this chapter, the experiences described inside each one of the five sectors (food and agriculture, energy, waste and industry etc.) are organised into two distinct groups. First, he deals with the *localists'* initiatives, developed by representatives of the middle class and by micro entrepreneurs, for example, farmers' markets, decentralised generation of energy (solar panels and small wind generators) and "buy local" campaigns. Complementing these initiatives, he describes the *access strategies*, which look to allow socially excluded groups access to local resources such as community gardens, fuel cooperatives, and second hand charity shops.

In the final chapter, Hess leaves the descriptive perspective and adopts a more propositive position. Although utilising the term sustainability in his closing, he tries to differentiate the majority of authors from rich countries (that had reduced the question of the sustainability to its environmental dimension) and, to strengthen the social dimension, proposing the search for *just sustainability*. Trying to break down his principal results, Hess recognises that IOMs would only obtain partial moratoriums, while the advances gained by TPMs and localisation movements were only marginal. When presenting his final reflections, the author demonstrates an ambiguous position, contemplating that, if, on the one hand, reforms would transform the world into a better place; on the other hand, *alternative ways* would not even have obtained the complete

implementation of the proposed changes. Concluding the work, he proposes some changes in the operation of businesses in order for the United States' society to get closer to *just sustainability*.

People who take the time to read *Alternative Pathways in Science and Industry* will have access to a good description of social movements and changes in the USA with issues related to science and technology, the environment and local development. However, Hess is not proposing to do much more than this. Throughout the book, the reader may feel the lack of some elements, such as an analysis of the USA's relationships with other countries, and a critique of the existing development model.

Readers who, attracted by the sub-heading, buy the book looking for a debate on global issues, will have their expectations frustrated. Hess uses the term "globalisation era" to refer to the most recent period of capitalism, marked by neoliberal paradigms, and rarely looks outside of the USA. In the few instances this occurs, he analyses how actions in other regions can impact *alternative ways* inside the USA, like for example, the impact of low cost industrial production in Asia on selective waste collection and recycling programs in the USA.

A second element that could have been incorporated into the book would be a more critical vision of current society and the effective development model in the USA. At some moments, Hess explicitly puts aside the naivety of those who believe that "many times the economic elites and politicians see their actions as representing the best interests of society" (p.22). Furthermore, his suggestions for reaching *just sustainability* are mainly directed at business and are based on a barely critical technological optimism. He does not question the current development model based on increasing consumption and affirms that

societies only need to consume differently (and not to consume less) to prevent environmental problems.

When starting this book, Hess was handed a difficult task. The final result, although with some problems, helps to give an understanding of the relationships between social movements, the market, and technological innovation. His analytical contribution to the processes of transformation and incorporation of social movements is a warning for all people concerned about the environment and social issues. Although the author managed to identify an optimist perspective within the cases he related, they are rather worrying and deserve debate. The proposals made by Hess in order to reach *just sustainability*, however, still seem insufficient, leaving for readers the challenge to construct new strategies that allow social movements to make the necessary changes for the construction of a society that guarantees social justice and environmental respect.

Notes

1. LEYDESDORFF, L.; WARD, J. Science shops: a kaleidoscope of science–society collaborations in Europe. **Public Understanding of Science**, v.14, p.353-72, 2005.
2. FREIRE, P. Criando métodos de pesquisa alternativa: aprendendo a fazê-la melhor através da ação. In: BRAN-DÃO, C.R. (Org). **Pesquisa participante**. São Paulo: Editora Brasiliense; p.34-41, 1981.
3. BROWN, P. When the public knows better - popular epidemiology challenges the system. **Environment**, v.35, p.16-41, 1993.
4. MOL, A.P.J. **The refinement of production: Ecological Modernization theory and the chemical industry**. Utrecht, the Netherlands: Van Arkel, 1995. 