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REVIEW ESSAY

Natural Sciences and Social Sciences
Where Do the Twain Meet?

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Klintman, Mikael. 2017. *Human Sciences and Human Interests: Integrating the Social, Economic, and Evolutionary Sciences*. London: Routledge.

Jetzkowitz, Jens. 2019. *Co-evolution of Nature and Society: Foundations for Interdisciplinary Sustainability Studies*. London: Palgrave Macmillan.

Over the past two centuries, there has been a widening gap between the natural and social sciences. Natural sciences have seen a dramatic expansion of subdisciplines, volume of research, and societal impact, and, at the same time, a unification of research approaches within a dominant physicochemical paradigm. Social sciences, on the other hand, have searched for theories and methods that would allow them a place as independent and relevant scientific disciplines next to their powerful neighbors. For some of the social disciplines, such efforts moved them closer to the natural sciences. Economics has focused on the development of predictive models based on mathematical descriptions of economic transactions. Evolutionary psychology and neurosciences apply evolution theory and neurophysiology to explain human behavior. In major social science disciplines such as sociology, anthropology, and political sciences, however, specific social science concepts and methods prevailed, and were further developed into widely diverging directions, varying from empirical research into attitudes and institutions to structuralist, constructivist, and social practice approaches.

For plausible reasons, calls to bridge the gap between natural and social sciences have become louder in recent years. Natural science research is encroaching on domains that once were thought to be at the heart of social sciences, and social sciences are increasingly concerned with human bodies and with other issues that clearly have biophysical

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dimensions, such as environmental problems (Van Koppen 2017). This review discusses two recent books that take up the challenge. Mikael Klintman's (2017) *Human Sciences and Human Interests: Integrating the Social, Economic, and Evolutionary Sciences* and Jens Jetzkowitz's (2019) *Co-evolution of Nature and Society: Foundations for Interdisciplinary Sustainability Studies*. Both advocate the integration of natural science and social science insights, both address issues of environmental protection, and both employ a pragmatist epistemology, linking science to practical insights of everyday life. Beyond these common elements, however, they differ vastly in approach.

Human Interests

Klintman's book has three, interrelated aims. Two of them are in the book's title: Klintman sets out to investigate human interests as a key category for understanding human action, and he aims to break down the walls of mutual ignorance between the social, economic, and evolutionary sciences. To better understand human interests, he claims, we need to combine and integrate insights of all these "human sciences." The third and final aim is to explicate a theory of "social rationality" that helps understanding human interests where they go beyond essential physical needs. His book presents a clear and well-structured argument, with many practical illustrations—mostly from the domains of environmental protection and health care—to substantiate these aims. The first part of the book explains the basic concepts of the argument. Klintman's central distinction is that between manifest and latent interests. Manifest interests are interests that are apparent and well recognized. Examples are improved health, reduced environmental harm, and increased material welfare and comfort. Latent interests refer to underlying motives that drive human action in implicit and unconscious ways. Examples are social bonding and exclusion, hidden self-interests, and striving for social esteem.

To further characterize human interests, Klintman brings in the distinction between Apollonian and Dionysian interests. Apollonian refers, largely, to traits that are typical for enlightenment thinking: being conscious, explicit, and self-constrained, and making balanced, well-considered decisions. Dionysian, by contrast, stands for Romanticist ideals: being passionate and impulsive, and spontaneously engaging in emotional relations and activities. The distinction was put forward by Nietzsche, who thought himself in the Dionysian camp. In Klintman's

analysis, latent interests are mostly, though not exclusively, Dionysian of nature, while manifest interests mostly relate to the Apollonian dimension. His critique on current social science interpretations of human interests, for example, in analyzing the attitude-behavior gap in issues of health or environmental protection, is that they neglect the latent, Dionysian interests. The social rationality that guides human action "involves an interplay of the Dionysian and Apollonian dimensions." This line of thinking is systematically elaborated by reviewing findings from economics, evolutionary science, and social science for a range of key issues in social science debates. As Klintman demonstrates, mainstream social science often focuses on manifest, Apollonian interests but can also reveal the importance of latent interests such as social bonding and esteem. Evolutionary sciences such as evolutionary psychology and neuroscience help us understand latent interests. With its paradigm of rational choice, traditional economics sides with the Apollonian interests, but the new branch of behavioral economics has turned to latent interests as well.

Nature and Nurture, Continuity and Change

A major part of the book is dedicated to the debates on universal versus culturally specific interests and, related to that, on nature versus nurture. Klintman holds that social science scholars tend to avoid or downplay universal interests out of fear for biologism. Evolutionary scientists, on the other hand, often posit culturally specific patterns, such as liberal democracy, as a manifestation of natural and universal interests. Between these extremes, Klintman steers a middle course. Yes, there are human universals and elements of the human condition shared by all human beings. And yes, many of these common elements have genetic components—as also individual variations may have genetic components. But most of what makes up individuals and societies is strongly influenced by culture, that is, by the capacities and habits that are acquired by humans as members of society. And culture is instrumental not only in shaping context-specific human interests, but also in shaping universal interests.

In exploring the foundations of human interests, Klintman takes up the work of the social psychologist Jonathan Haidt, who argues humans are genetically equipped with receptors—"taste buds" so to speak—for morality. Haidt posits six moral categories founded in such receptors: care vs. harm, fairness vs. cheating, sanctity vs. degradation, liberty vs.

oppression, authority vs. subversion, and loyalty vs. betrayal. Klintman adds a seventh category that Haidt tentatively mentions: waste vs. efficiency. Like Haidt, he contends these moral foundations can be "traced to our genes" and exist in all human societies; therefore, they can be helpful in human sciences investigations. In environmental social science, they can shed light on efforts to advance environmental policy and management. Authority vs. subversion, for example, is a moral issue in the constitution and acceptance of environmental expertise.

The most important point emerging from the integrated analysis of human interests is the key role of social esteem. This latent interest is universal among human beings and often takes priority over manifest interests such as improved knowledge, material wealth, or environmental protection. To understand why humans diverge from economic and ecological rationality, we need to realize social rationality is strongly influenced by other motives, and most prominently by our inborn interest in social esteem and social acceptance. Seemingly, the argument thus far leads to a view of society that emphasizes continuity rather than change, and social conservatism rather than social progress. However, Klintman's analysis of different views on this matter among the human sciences makes clear that this is not necessarily so. Evolutionary science does not preclude societal change in directions that we consider morally preferable. Human beings at the top of the social hierarchy will tend to cling to their position, but at the same time, several of the moral foundations of humanity work toward reducing inequality. As Klintman aims to show, even the principles of evolutionary selection point to interest in change under certain social and economic conditions.

Critical Notes

Klintman convincingly argues that in contemporary research, we should engage in cross-disciplinary knowledge exchange and try to overcome the "binary" dichotomy of nature and nurture. In a clear and understandable way, he reviews a wide range of actual debates and provides examples of how to do this. He also gives a plausible account of social rationality as a basis for an integrated framework about human interests. Notwithstanding these strong merits, I have two critical notes. One is on the way evolutionary science is integrated in social analysis. In popular science, evolution and brain functioning are frequently called upon to explain social phenomena. Too often, however, this is done on shaky scientific ground. Often, a state of affairs that is known from common

sense or social science research is "explained" by a post hoc narrative of how this state provided evolutionary advantage in human species development—a narrative that, on closer sight, can be neither proved nor falsified because the specific data on human evolution are lacking. Or, neuroscience findings, typically presented in vividly colored brain models, are extrapolated to explain human behavior that in fact is much more complex and diverse.

Klintman is well aware of the perils of simplified evolutionary and neuroscience explanations, but in my view, he steers not always clear from them. Just to be clear, my critique is not about the general assumption that there are close relationships between human genetics, brain functioning, and human agency; I concur with Klintman that such relationships are most certainly there. The critique is that as long as we have no concrete natural science evidence of a causal relationship that specifically accounts for the human behavior to be explained, reference to evolution or the brain provides at best a sensitizing hypothesis, but not a sound explanation. At several places in the book where Klintman invokes natural human sciences to underpin his views, this criticism can be raised, for example, when he explains certain habits and routines by referring to the evolutionary advantage of a brain economizing on energy, or when he associates latent interests with the primitive, pre-human parts of the brain.

Another critical note concerns the limited attention to institutions. Of course, a book cannot cover everything, and this book's focus is mostly on individual humans and their interests. But if we consider social rationality as a key driver of human action and observe, with Klintman, that this driver may have good and bad consequences for society, then the question rises what can be done to promote a better society. Klintman puts his hope in an integrated science that helps us better understand social rationality. But it is hard to see how such a science could do without a better understanding of the role of institutions in molding social rationality. If we accept Haidt's and Klintman's ideas that human beings have a set of universal moral foundations, then it is clear that on these foundations widely different societies can be built, some cursed with poverty and violence and others flourishing with resource development and mutual care. The crucial difference, then, is in social structures, that is, in a society's institutions. There is an interesting link here with recent work in evolutionary psychology on the "dual inheritance theory," which aims to bring together evolutionary processes and cumulative processes of social norms, technological change, and institutions (Muthukrishna and Henrich 2019).

Sustainability Discourse

Structures and institutions receive ample attention in Jetzkowitz's book. His focus is the sustainability discourse, and the aim of the book is to investigate the methodological foundations of a science of coevolution that can support this discourse. In his approach, the sustainability discourse and coevolutionary science are intrinsically related. Discourse—interpreted in a pragmatist and post-structuralist sense—includes action. And coevolutionary science is part of that discourse-in-action. Scientific knowledge is a coevolving factor in the human-environment coevolution. In outlining his approach to coevolutionary science, Jetzkowitz is inspired by concepts from ecosystem research, system theory, and sustainability science, developed by authors such as Richard Norgaard, Marina Fischer-Kowalski, Elinor Ostrom, Hans Joachim Schellnhuber, Helga Nowotny, and others. Rather than specifying the concepts and methods of coevolutionary science, however, he explores the epistemological and methodological barriers that have obstructed its successful development so far. In doing so, he engages in debates on sustainable development as well as philosophical debates on knowledge, science, and society.

To illustrate the central problem that he aims to overcome, Jetzkowitz makes an interesting comparison between deep ecology and ecological modernization as contrasting views on sustainability. Both entail theories of social change and describe ways institutions need to be changed for a sustainable future. But, as Jetzkowitz argues, both rely on strong assumptions about the structures of society that remain unquestioned. In deep ecology, there is a blind spot for the ways a holistic approach to nature can be socially organized. Ecological modernization takes the growth-oriented economy as a given and thereby excludes opportunities for other pathways of societal development. The science we need, then, is one that continuously investigates the dynamics of society and nature, as well as the assumptions that we use in investigating. In Jetzkowitz's concept of science, this does not preclude reliable knowledge. We live in a world structured by natural laws and behavioral rules, which we can make subject of empirical research. But the reliability of our knowledge does not reside in claims to objectivity, or in canonization of disciplinary approaches. It resides in constant cross-examination of knowledge in transdisciplinary debates. Clearly, this view on science progress invokes a multiplicity of perspectives and views, and this is something Jetzkowitz embraces rather than deplores.

Critical Theory

Jetzkowitz's position brings him close to critical theory, as elaborated by Max Horkheimer and Theodor Adorno, and most comprehensively by Jürgen Habermas. However, as Jetzkowitz demonstrates, Habermas sets an a priori restriction on the relations between humans and nature. The emancipatory freedom that, in principle, characterizes human relationships is positioned against the fixed and morally indifferent relationships in nature. In a way that resembles Klintman's argument, Jetzkowitz posits such a divide between social and natural sciences is no longer tenable. Social sciences need a conceptual framework focusing on social and cultural factors as well as on human relationships with biophysical systems. This goes, par excellence, for the concepts and methods of coevolutionary science.

In a similar way as with critical theory, the book explores other philosophical and sociological debates that bear on knowledge and science. He discusses the epistemological arguments of Hume and Kant, the philosophies of science of Hans Reichenbach and Thomas Kuhn, the pragmatist theories of Charles S. Peirce and George Herbert Mead, the work of Bruno Latour, the conceptualization of transdisciplinarity by Basarab Nicolescu and others, and many other authors. In debating these different theories, he carves out the conditions for coevolutionary science in more detail. It is beyond this review to elaborate these debates, but it is possible to mention some key components that Jetzkowitz distills from them. Some of them I have already mentioned: scientific progress by a continuous cross-examination of findings and assumptions, and integration of natural and social sciences, particularly of biophysical human relationships into social sciences. Other components are an open exchange between scientific knowledge and everyday knowledge, and an emphasis on experimental learning in science and society. Not mentioned in the book, but worth noting here, is the similarity with some of John Dewey's (1916) ideas on democracy and education.

What Is Coevolutionary Science?

Jetzkowitz's journey along these different theories and views is impressive and illuminating. Still, at the end of the book, it remains difficult to discern what coevolutionary science is in more concrete terms, and how it can contribute to sustainable development. There are two

reasons for that. One is that the theories Jetzkowitz posits as the most promising basis for a fruitful approach are not easy to understand. Jetzkowitz attributes a key role to Peirce's theory of signs that, I must admit, I find very hard to grasp in a context of sustainability science. He also advocates the reintroduction of final causes as a crucial element of the concept of reality in coevolutionary science, which seems to me at odds with the dominant physicochemistry-based paradigm of contemporary natural science (see also Van Koppen 2017).

The other reason for the unresolved ending is that Jetzkowitz, intentionally, leaves further development of an adequate conceptual framework open to scientific discourse. Apart from the direction he envisages himself, he also sees possibilities for integration with other theories such as actor-network theory or Klintman's approach of human interests. Given his view on coevolutionary science as a research program rather than a distinct branch of science, this is a plausible stance. But as a reader, I would still have appreciated some more concrete cases of what the author himself sees as good examples of coevolutionary research. I hope he will provide them in coming publications.

Conclusion

For those who are interested in bringing natural and social sciences closer together in studying human-environment relationships, both of the books reviewed offer a rich set of valuable insights, from different, mostly complementary perspectives. One has a practical and concrete orientation and focuses on explaining the dynamics of latent and manifest interests as drivers of human action; the other is mostly epistemology-oriented and focuses on the methodological foundations of an integrated science that helps us understand and transform societal structures toward a sustainable world. If there is one joint message to be distilled from the books together, it is that they hopefully will stimulate concrete research projects that integrate natural and social science interpretations of social behavior on sound scientific ground, and in doing so shed new light on the pressing problems of sustainable development. As exemplary model—paradigm in the original sense of the word—such projects would help us further navigate this fascinating but tricky terrain.

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