

## Book Reviews

**Peder Anker:**

**Imperial Ecology: Environmental Order in the British Empire, 1895-1945.**  
Harvard University Press. Cambridge, Mass., 2001. xxx pages.

Peder Anker's *Imperial Ecology: Environmental Order in the British Empire, 1895-1945* interweaves the history and philosophy of science, environmental history, and the history of the British Empire into a narrative guided by the desire to understand how and why ecology became a powerful tool for engaging the epistemological, social, and environmental crises of the early twentieth century. By tracing professional ecologists centred in England and South Africa, their research and methods, and their interrelations up to 1945, Anker argues that the science of ecology expanded and was oriented in this period according to imperial prerogatives. Moreover, he dissects the formative debate between mechanistic and holistic views of nature, to expose the roots of each side in their respective social and political contexts, as well as the implications of this debate for including humans in ecological research.

The opening chapters trace the early generations of ecologists in England and South Africa. In the late 1910s the morphological tradition of ecology championed by Isaac Bayley Balfour in Edinburgh was challenged by a younger, socially radical research approach that focused on plant geography, and was ar-

ticulated through the work of Arthur George Tansley. Anker suggests that later, as the morphological conservatives in Edinburgh lost ground within the British scientific community, they continued to patronise research in South Africa. South Africa was not just a distant appendage to the British debates, but featured its own evolving ecological tradition largely under the influence of Jan Christian Smuts, a politician and general. Smuts' social, political, and scientific goals intersected in his theory of holism.

A second generation of ecologists emerged in the 1920s and 1930s in Britain, South Africa, and the United States. In Britain, the Oxford school of imperial ecology initiated Arctic expeditions, that became a rite of passage for young ecologists, and were part of a series of initiatives from within forestry, zoology, and sociology that expanded the scope of ecology. The application of aerial photography and the mapping of ecological relationships are described by Anker as key methodological innovations. Aerial photography in particular was suited to the goal of the Oxford school for "this aerial view on nature, social, and knowledge – *the master perspective from above* – was at the very core of British ecologi-

cal reasoning.” (116)

John Phillips, formerly one of Balfour's students and by 1931 a professor of botany at the University of Witwatersrand integrated Frederic Clements' renowned climax communities with Smuts' holism. This approach drew considerable criticism from Tansley, and Anker identifies the ensuing controversy as the point of origin for Tansley's ecosystem concept. Anker focuses on collaboration and correspondence between ecologists in these distant countries, as well as the conferences, especially the Fifth International Botanical Congress, that brought them together and exposed the contested character of ecological science.

The final chapters of *Imperial Ecology* reveal how the application of ecology to human communities turned ecological science into a “path for planning a better society” (196) Anker ends his study in 1945 when Smuts incorporated holism into his draft on human rights for the Preamble to the United Nation Charter. Anker denounces Smuts' holism as a means of inscribing racist policies into the social and economic planning guided by ecology. Human ecology is also criticised by Anker where he demonstrates that “ecological explanations of the human condition implied a degradation of human moral and political life that encouraged scientific paternalism and the management of human faculties.” (196) H.G. Wells' *The Shape of Things to Come* serves as one example of the planned utopia that ecologists such as Wells, Julian Huxley, and Edgar Worthington hoped to realise through human ecology.

*Imperial Ecology* narrates the conceptual evolution of ecology from plants, to animals and humans alongside the ad-

dition of new sites and methods of research to the discipline. Anker's style is straightforward and his organisation effectively ties together the far-flung regions and diverse personalities relevant to his analysis. This work raises several important points and complicates current interpretations of the evolution of ecological thought. Nevertheless, it is “an in-depth study of... a handful of highly influential scientists and politicians” (2) and accordingly some of the larger conclusions this work attempts, regarding the north/south axis of research and the imperial implications of ecology, fall short of convincing.

As suggested by the title Anker defines ecology as an order of knowledge of humans, society, and nature. From the distinction between these categories it is obvious that he himself disdains the holist view of nature, as well as the role of “environmental agency” (4) in history. Part of this disdain is rooted in the unsettling alliance of Jan Smuts' holism and racist politics: Anker is intent on demonstrating how holism and other ecological theories that embed humans in nature, distinguish between human “biotic” communities and in turn insist that these communities conform to their place on the evolutionary scale (132). This in turn facilitates the exploitation of certain groups by others higher on the defined scale. Yet Anker fails to distinguish that the relationship between holism and racism is not inevitable but lies in the historical evolution, the social and political context, that shaped Smuts' approach.

Anker sympathises with mechanistic views of nature, but more important to his analysis are his attempts to dissolve the sharp distinction between “bad’

mechanistic management to conserve natural resources and 'good' Arcadian approaches to preserve unspoiled nature" (197). Anker insists that there was no simple development of either Arcadian reasoning or management thought among ecologists in the British Empire. In this respect *Imperial Ecology* makes an important contribution to environmental historiography by complicating an interpretation of the history of ecological thought that was previously too narrowly conceived. Anker reveals considerable overlap between imperial and romantic views of nature, mechanism and Arcadianism but he fails to replace the flawed dual vision with an alternate organising principle. Anker suggests that these ecologists were unified by a "shared critique of urban life and culture" (4) but provides no sustained analysis of this shared critique.

Britain and South Africa are the northern and southern poles for early-twentieth-century imperial ecology. Anker observes that the northern arctic environments of Spitsbergen, and the southern grasslands of South Africa influenced ecological theories and mechanisms. For example, "ecological explorers were used to laying out zones in the sparsely vegetated arctic, and they continued to use this method in the tropics." (110) But on the whole landscapes remain peripheral to *Imperial Ecology* which is much more a history of ecology than an ecological or environmental history. Furthermore, along this north/south axis there were particular power relations: Britain in the north, remained the heart of the Empire and the imperial scientific community. The shape of power along this axis, and how it would have influenced ecological de-

bates is left unexplored. The significance of the north/south axis is avoided and this concept serves mostly to signify the relative location of different groups of ecologists and their research areas.

The imperial setting of the scientific drama is also obscured. Early on, Anker states his interest in exploring the relationship between ecology and economy (2). He concludes that ecological research was designed to further the economic and political ends of imperial elites. Pointedly he remarks how "ecological management of destructive activities was important to protect human resources and economic prosperity" (167). The colonial project and organisation of human relations were thus tied to ecological knowledge. But conquering and ordering the land in such a way as to best exploit it and sustain those in power was hardly an imperative new to the twentieth-century British Empire. Anker's evaluation of the relationship between ecology and economy in the imperial context likewise lacks originality. To effectively consider these goals within the British imperial context requires closer attention to the networks and channels of communication, authority, and partnership within imperial politics and economics.

In *Imperial Ecology* Anker traces the evolution of ecological ideas through the readings and writing of individual scientists, and their communications with one another. Through this analysis, Anker is able to demonstrate that Tansley's idea of ecosystems drew deeply from his research and experience in Freudian psychology. "His ecosystem theory of 1935 was a comprehensive theory of energy flows and response mechanisms among the nervous system of the mind, the so-

cial systems, and systems of energy in nature.” (239) Contrary to previous readings, Anker demonstrates that physics and chemistry were relatively insignificant to ecologists’ understanding of the natural world as compared to psychology, literature, or economics. Indeed, Anker’s “anthropocentric” (4) analysis, his emphasis on the social context of ecology; its social and political ramifications both on an international scale (with Smuts and the UN Charter) and on a local scale (as Charles Elton and John Phillips each sought to apply ecology to the organisation of academia); and the relationship between social theories and evolving ideas about the natural world are the main contributions of this work.

On the whole *Imperial Ecology* offers a dark assessment of the early-twentieth century history of ecology. Peder Anker insists that within the context of the British Empire, ecology was as much a tool to further social and political ends as it was as means to bring humans closer to nature, and he uses Smuts’ South Africa and Aldous Huxley’s *Brave New World* to present two frightening consequences of imperial ecology applied to human communities.

Elizabeth Piper  
York University,  
Toronto, Canada  
piper@yorku.ca

**Reijo Miettinen:  
National Innovation System – Scientific Concept or Political Rhetoric  
Edita Prima Ltd. Helsinki, 2002. 168 pages.**

As a book which seeks to develop a clear understanding of the development, application and transformation of the term national innovation system (NIS) in Finnish science and technology policy, Reijo Miettinen sets forth a detailed, rich and impressive work. The adoption of NIS as a foundational term into Finnish science and technology policy at the beginning of the 1990s serves as the starting point for a thorough analysis of what Miettinen calls an imprecise boundary metaphor, not rooted so much in expe-

rience and knowledge, but rather serving more as a visionary term and an important organizing concept.

Miettinen begins by examining how the NIS was adopted into Finnish science and technology policy from an international ‘factory’ for policy-making language. Beginning with the OECD and the EU, various projects were set out to develop new tools for policy-making that could be distributed and used internationally. As a new policy tool developed by researchers from science and tech-

nology policy units, universities and business schools, NIS quickly became a powerful rhetorical tool in national policy making. According to Miettinen, a major problem with this approach was that the evidence on which policy documents were written lacked empirical grounding.

One of the central arguments of the book is that in developing more effective policy measures one needs to study innovation processes and the related networks in more detail. It comes as no surprise that of the two general theoretical sources for the NIS concept, Miettinen argues that theories of interactive learning, as opposed to explaining differences in economic growth rates provides a more fruitful basis for further enquiry. The role of knowledge and the processes involved in its creation and learning, therefore, become a central component in understanding economic development. This, according to Miettinen, has served as an important reorientation of theoretical work into innovation studies.

Chapter 4 looks at NIS in Finnish science and technology policy and the way its role has changed over the years from an organizing concept to become a normative and political concept where national policy is made natural and inevitable. At the same time, Miettinen argues, there seemed to be an absence of critical discussion and analysis of the term and its use. The author goes on to use an analysis of regional dimensions to illustrate some of the limits of systemic factors of innovation policy. Instead of looking at systemic explanations, the author argues that historical factors play an important role where novel combinations of 'international and regional collaborations are neces-

sary for the creation of products intended for international markets.'

Here perhaps, if anywhere, lies an area that in my opinion requires further elaboration and work. In emphasizing product or task-specific projects based on case studies to develop a more concise understanding of the dynamics involved in national science and technology policy, Miettinen is able to provide a rich source of material used for insightful analysis of the theoretical basis of NIS and its related problems. At the same time, however, he seems to overlook some broader issues as to the relationship between the concept of NIS, policy making and its relationship to knowledge production. The use of technology specific cases to support arguments seems to exclude the more general question as to how certain policy dilemmas need to be addressed when there is a lack of experience or evidence in solving such matters. The NIS framework has implications in basic research as well and its role in the production of innovations. Ethical and moral dimensions, for example, have become a major problem that policy makers are facing in new research areas such as genetics. Certainly we cannot wait for somebody to develop a start-up to commercialise results from population genetics, wait to see what happens and then analyse the problem afterwards. How does one define or identify 'users' in the context of basic science? Could it be that the limits of the term national innovation system also derive from its over-emphasis on the productive component of social interaction, whether in terms of learning or focusing on systemic components?

If national competitive advantage is based on certain unique factors in spe-

cific contexts, then what should be the role of the state in facilitating the use of such factors? How should conflicts between state aspirations in promoting science and technology as a source for national wealth and competitiveness and certain moral and ethical issues be resolved in policy initiatives? What, if any, should the limits of state activity be in the context of an international race for scientific advancement and market positioning? Knowledge production and innovation systems cannot, in my opinion, be reduced only to an analysis of dynamic learning networks between producers and users, but necessarily involve a much broader spectrum of stakeholders and issues both nationally and internationally. For policy making this is a major challenge.

Being that the term national innovation system has come to play such an important role in the formation of both science and technology policy, it would be important to analyse the relationship between scientific systems of knowledge creation in basic science, their relationship to the development of innovations and the role of the state in promoting such networks through the deployment of the national innovation system concept. After all, national innovation system seems to have embraced more than merely the technology producing components of the innovation system.

The use of the NIS concept as a vehicle of national consensus, where critical discussion of the use and application of the term was eliminated by rendering it 'natural and inevitable' and thus creating a 'homogenous rhetoric' is, however, an important point that Miettinen makes. The consequences of this strategy in terms of a teleological conception of

modernisation are considerable. The development of an official 'world view' undoubtedly raises serious questions concerning the role of the state and democracy.

Miettinen points out poignantly in his conclusion that the term 'national innovation system is only a starting point for further research' and that more concrete knowledge is needed on the subject. Miettinen's book is an important contribution to this field of research and certainly opens up a multitude of possible investigative possibilities for further inquiry. I would recommend *National Innovation System – Scientific Concept or Political Rhetoric* to both those who are not acquainted with the field and would like to get a thorough and critical introduction to the term and its use, as well as to those who have been involved in its study for a long time and are looking for new ways to approach the research area. Miettinen's style of writing is precise, critical and insightful and will serve, I am sure, as a starting point for many future studies in the field.

Aaro Tupasela  
Department of Sociology,  
University of Helsinki, Finland  
aaro.tupasela@helsinki.fi