

litically oriented social epistemologist, Joseph Rouse. Remedios's discussion on their differences and how Rouse ends up discarding the legitimization project and normative philosophy of science, while Fuller turns to the governance of science and political philosophy of science, is especially illuminating. For Fuller, the role of philosophy, in contrast to empirical research, is to make hypothetical prescriptions for the governance of science. Science as such, on a global level, is legitimized through knowledge policy. Furthermore, scientific knowledge is a commodity, produced and consumed, requiring resources, and therefore a subject to inequalities, which further calls for normative approach to science. In what follows, Remedios elaborates Fuller's views on science policy and norms in science, as well as the role of instrumental rationality and success, which is an unavoidable issue for Fuller's instrumentalism: he has to explicate a notion of scientific success in a way not

related to the questions about realism.

Remedios succeeds in systematising Fuller's social epistemology and putting it into its contexts. He also collects the main criticism and Fuller's responses to it, as well as develops both criticism and defence. The book goes beyond a mere introduction to Fuller's philosophy. Collecting these arguments into one book, Remedios has written a helpful starting point for further evaluation and discussion of Fuller's social epistemology. On the other hand, the book is written in a very compact style and not much further background is given for the debates that Remedios is discussing. This is likely to make the book a laborious introduction to these debates themselves for a reader without any previous knowledge.

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**Sven Hemlin, Carl Martin Allwood & Ben R. Martin (eds.):  
Creative Knowledge Environments. The Influences on Creativity in Research  
and Innovation.  
Cheltenham & Northampton: Edward Elgar Publishing Ltd., 2004. 225 pages.**

This book focuses on creative knowledge environments (CKEs). Authors dealing with the phenomenon define CKEs as those environments which exert a positive influence on scientists (and other creative workers) in producing new

knowledge. As reflected in the subtitle, the contributions are oriented to an analysis of the different components that build a creative environment. The book's authors come from different disciplinary backgrounds. Despite the

breadth of their professional backgrounds, here they mostly concentrate on a study of the social aspects of CKEs. In this sense, the volume presents a prevalent sociological perspective on the complex phenomenon of scientific creativity. Sociological approaches remain underrepresented in recent literature on scientific creativity. In the work under review, creativity in science is not dealt with as the property of particular gifted individuals as seen in the usual approach of classical 'sacred spark' theories of creativity. It is emphasised that the most creative achievements in science are outcomes of an interaction and/or collaboration with other people.

The book's three editors, Sven Hemlin, Carl Martin Allwood and Ben R. Martin, bring together seven contributions that concern the micro-, meso- and macro-levels of CKEs. These contributions constitute the work's core chapters. They are divided into two parts. The papers by Magnus Gulbrandsen and Mika Nieminen focus on the micro level of CKEs. Gulbrandsen elaborates on the organisational factors of creativity in research work. Nieminen attempts to assess the impacts that changes in Finnish R&D policy in the 1990s have had on the creativity and innovativeness of research groups. The second part of the book deals with the meso- and macro-level aspects of CKEs. This part comprises five contributions that shed light on the environmental factors at the meso- and macro-levels that provide the stimulus for creativity and innovation. Two Swedish studies, namely those by Lars Bengtsson and Jan-Inge Lind about the Ideon science park in Lund and by Lillemor Wallgren and Sture Hägglund about industrial doctor students, deal with how

regional environments and the education system contribute to the development of creative knowledge. The next two chapters consider the influence of national environments in France, Germany and the UK on the development of innovations in electronics, telecommunications and biotechnology. The authors are Geoff Mason, Jean-Paul Beltramo, Jean-Jacques Paul (Chapter 6) and Robert Kaiser (Chapter 7). Chapter 8 is written by Isabel Bortagary and examines the creative knowledge environments of South American nations at a number of levels. All of these contributions are mostly based on empirical analysis. Especially interesting reading is provided by the book's introductory and final chapters that were written by the editors. While in the starting chapter the editors introduce readers to the basic approaches and concepts of CKEs, in the final chapter they provide a systematic summary of the main ideas and findings about CKEs that have previously emerged from similar studies of creativity.

It is a pity the book does not pay more attention to the question of the role played by the social environment concerning different sorts of creativity. Namely, to put the complex phenomenon of CKEs into the broader context of the discussion about human creativity; at least in the book's introduction it would have been useful to briefly present the main differences between the various forms of intellectual creativity: creativity in science, creativity in the arts, creativity in technics etc. Readers would certainly have been interested to find some basic arguments in the book regarding whether different types of human creativity require different social environments.

For all contributors to this work the construction of a well-formulated taxonomy of CKEs is a key research task. The book is distinguished by its coherence because the contributions do not analyse the different levels of CKEs separately, but take the interdependence between them into regard. Another advantage that the book has is that the discussions do not remain at the conceptual and abstract level. The general concepts and conclusions are confirmed by a detailed empirical analysis. It could thus be said that the volume offers a good example of the interconnection between theoretical and empirical reasoning.

It is impossible in this short review to draw attention to all the conclusions made in this book. I shall, however, mention one that I selected due to its topicality in recent debates on the emergence of the new knowledge society. Namely, in the STS literature we encounter an abundance of discussions concerning the relevant factors leading to the new knowledge society. Following these discussions, the critical reader cannot avoid the impression that factors regarding the micro-social context of intellectual creativity are still marginalised. For example, the scientific and political discourses on Europe's strategic goal to become the most competitive and dynamic knowledge-based society in the world are still mainly supported by a socio-economic analysis oriented to global indicators. A creative knowledge environment at the micro-level is not often a subject of these discussions. In this regard, the book under review takes an important step forward. It identifies and analyses various factors beneficial for creativity in the micro social context, such as within research teams and sci-

entific laboratories. It is only within this micro context that it becomes possible to observe and evaluate the importance of (informal) factors, such as a good intellectual climate for research work, the feeling of having autonomy and freedom of research, to be part of a team, and to have active professional discussions. Or, to use the words of the authors, it is especially in the micro context that the so-called chemistry between people plays the crucial role.

The thesis emerging from previous studies that autonomy is a fundamental precondition for creative scientific work is confirmed. Namely, autonomy and freedom in research are tied to an organisational culture which prefers openness, tolerance, and co-operation. Yet the antithetical character of CKEs (at all levels, not only the micro level) is not neglected here. In this sense, the 'balance' between independence and interaction, between intellectual harmony and conflict, between a 'light' management style and the imposing of bureaucracy – to mention just some of the tensions – can decisively contribute to increased scientific creativity. Alternatively, as it is said in the book, '...maintaining organizational tensions implies sustaining forces that play both a stabilizing and a destabilizing role. On the one hand, tensions destabilize interactions, sweep away social capital and open up new pathways of development. Yet tensions also have a stabilizing side as they slow down the decision process and make for a slower, yet more creative and holistic, development process' (p. 54).

To conclude, the book presents a very detailed comprehensive theoretical and empirical study of the different dimensions of a creative knowledge environ-

ment. It is recommended for reading not only by students and experts in STS, but also by all practitioners involved in policy decision-making processes.

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**Toward a Philosophy of Science Policy: Approaches and Issues.  
(Ed. Robert Frodeman and Carl Mitcham).  
*Philosophy Today*, Supplement 2004, Vol. 48, No. 5. (April 2005, 124 pp.)**

*Philosophy Today*, a major North American forum for continental philosophy, recently published a supplementary issue on the theme of philosophy of science policy. There are two reasons for reviewing this volume rather than a book on the same topic. First, the theme is pertinent as it addresses a considerable lacuna in the academic literature, and second, hardly any books exist on the topic. The central concern of all the 24 authors of the volume is that, in addition to various, already existing, academic fields that study science (and technology), a special philosophy of science policy is needed.

The articles in the issue address a host of intriguing topics. They include, for instance, G.W. Bush's council on bioethics and its stance on stem cell research (Eric Cohen), social benefits of applying Linux-based Linex in the Spanish Extremadura region (Andoni Alonso *et al.*), scientific citizenship (Kristin Shrader-Frechette), autonomy of science (Philip Kitcher), humanities policy (Frodeman *et al.*), nationalistic ethos in science education policy (Juan Lucena),

a wider view on the social context of science policy (Daniel Sarewitz *et al.*), and a political philosophy of science (Ambrosio Velasco Gómez). The authors represent seven countries and more than dozen disciplinary backgrounds. More than half of the articles are co-authored. They consist of both empirical case studies and theoretical approaches. This is no accident, claim editors Carl Mitcham and Robert Frodeman, but reflects the inter-disciplinary, collaborative, and global character of the field they attempt to advance.

Mitcham and Frodeman point out that the need for such a branch of philosophy becomes evident when one notices certain absences in the already existing "neighboring" fields. These include the philosophy of science, science and technology studies, policy studies, political philosophy, applied ethics, and philosophy of technology. Mitcham and Frodeman note that philosophy of science is somewhat blind to the societal and political embeddedness of science. Science and technology studies that do pay attention to these conditions are in