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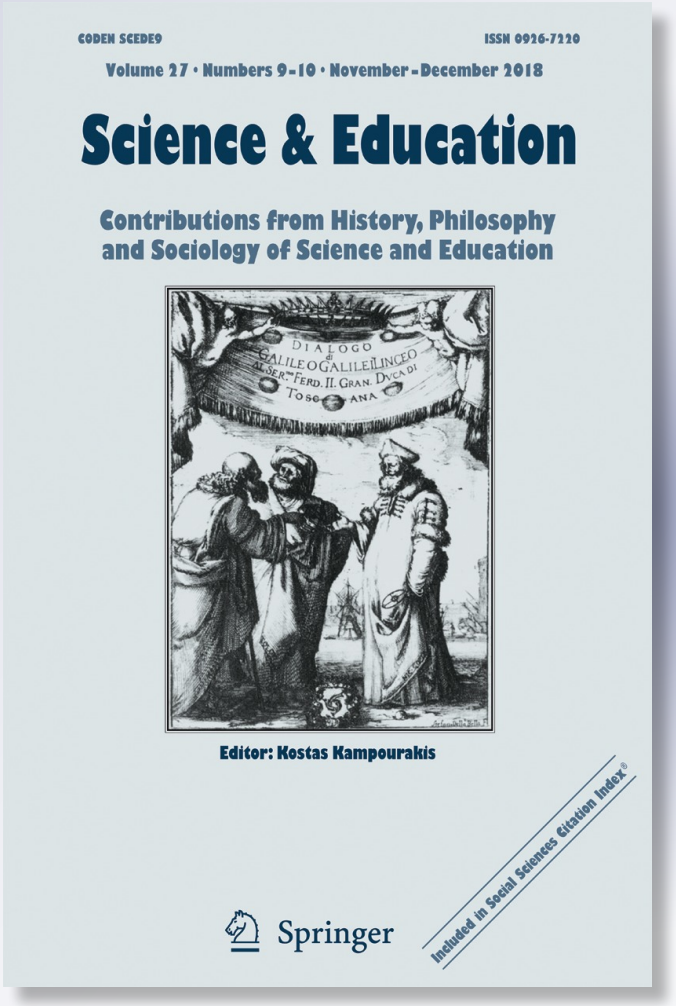
Science & Education
Contributions from History, Philosophy and Sociology of Science and Mathematics

ISSN 0926-7220
Volume 27
Combined 9-10

Sci & Educ (2018) 27:1029-1032
DOI 10.1007/s11191-018-0013-9



Springer

Science & Education (2018) 27:1029–1032
https://doi.org/10.1007/s11191-018-0013-9

BOOK REVIEW

Rhetorical, Narrative, Cognitive, and Epistemological Perspectives on Science and Culture

Kris Rutten, Stefaan Blancke, Ronald Soetaert, Eds. (2018) Perspectives on Science and Culture. Purdue University Press, West Lafayette/IN. ISBN: 978-1-55753-797-3, 308 Pages, Price: $45.00 (Paperback)

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Published online: 28 November 2018

1 Introduction

The diverse and interdisciplinary approaches gathered in Kris Rutten, Stefaan Blancke, and Ronald Soetaert's edited volume *Perspectives on Science and Culture* calmly and measuredly investigate the continuities and discontinuities between scientific understanding and cultural representation. The book thus constitutes a welcome addition to an academic terrain that has been occupied by positions as diverse as—in the disparaging characterization by the respective detractors—"crypto-positivism" or "scientism" (ranging over empiricism, naturalism, scientific realism, and rationalism), and the "politically correct" "academic left" (comprising postmodernism, poststructuralism, constructionism, radical sociology, and the like), a terrain that has, unsurprisingly, been marked by vociferous disputation and substantial acrimony. The book provides fresh insights into the so-called "science wars," exploring the tensions between what C.P. Snow has referred to as the "two cultures," i.e., the sciences and the humanities, and also engaging with Jerome Bruner's account of logical-scientific versus narrative modes of thinking. In what follows, I examine the different perspectives—rhetorical, narrative, cognitive, and epistemological—especially in relation to the educational dimensions and implications, the socially/culturally aware teaching, and learning of science.

2 Rhetorical and Narrative Perspectives

The chapters collected in this section demonstrate how science develops and how science education takes place on the basis of rhetorical (or persuasive) and narrative devices. Scientists

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and science teachers work within a discursive community. They communicate their knowledge, publicize their findings, articulate their doubts and concerns, argue with one another, and seek to convince others of the correctness of their beliefs. Of course, those dabbling in pseudoscience also operate in discursive spaces. They too seek to publicize their beliefs and persuade others to accept them. The crucial difference, however, is that in doing so, they generally tend to present content in a way that violates the criteria for inquiry, for example, by suppressing critical evaluation of reasons and evidence; use a pedagogical method that is inconsistent with the requirements of the general nature of enquiry and moral principles; and want the recipients (e.g., learners) to form certain unshakeable beliefs, even in the face of contrary evidence. The function of discourse in science and science education, however, is arguably different. Guided by evidence and by both truthfulness and a quest for truth, rhetorical and narrative devices play an important part in *rational* persuasion, and this underlines their educational and pedagogical value.

Among the chapters collected in Part 1 of the book is David Tietge's account of the anthropocentric representation of nature on cable television, which generally aims for "edutainment," i.e., education through or by means of entertainment. A related aspect, the educational function of popular science and the kind of rhetoric at work here, is discussed in Alan Gross' chapter. Richard van Oort tackles the traditional "conflict" between the sciences and the humanities by focusing on an aspect central to both the question of human origin (this is also the subject of Peter Kjærgaard's contribution) and specifically, the origin of human language. Ronald Soetaert and Kris Rutten deal with the debate between and about the "two cultures" by way of an analysis of how fiction may be used to problematize and thematize the confrontation between science and art.

3 Cognitive Perspectives

Part 2 essentially deals with how the cognitive sciences yield findings and insights that contribute to our understanding and appreciation of science. Contrary to what some philosophers (notably John Locke) have thought, the human mind is not a *tabula rasa* but is, rather, equipped with "intuitive expectations" concerning significant parts and aspects of our *Umwelt*. These intuitions are educationally relevant for two reasons. They often constitute cognitive obstacles that science, scientists, and science teachers need to overcome. After all, scientific concepts and theories are often highly counterintuitive. The challenge, therefore, is to devise tools and methods for achieving this. However, if these intuitions are addressed appropriately (and this is arguably where some of the rhetorical and narrative devices at work in education, as discussed in part 1, come into play), they can be put to use as scaffolding for learners' scientific grasp of the world. The chapters collected in this section all deal with the various roles played by intuition in the development, transmission, and understanding of science and scientific knowledge.

Elisa Järnefelt confronts persistent intuitions that have also characterized, for worse rather than better, the attitudes and positions of a veritable slew of U.S. presidents and other influential politicians—namely about evolutionary theory and anthropogenic climate change. Especially useful for science educators are Järnefelt's recommendations for dealing with these and similar prejudices in a classroom context. On the subject of intuitions about evolution, Margaret Evans's chapter, too, offers suggestions for employing core intuitions not as hindrances to biological reasoning but as promoting or, to use Evans's term, "jump-starting" science learning. A third contribution dealing with competing ideas about evolution is

Dominique Guillo's analysis of different representations of the origin of species in secular (French) and religious (Moroccan) contexts. He argues that there are no sharp boundaries between adherence to evolution, on the one hand, and creationism on the other. He takes the "fuzziness" of people's beliefs as providing grounds for problematizing the distinction between "theory" and "intuition," arguing that working creatively and constructively with the uncertainty that marks people's interactions may be "crucial to ensure an effective dissemination of evolutionary theory, especially in education."

4 Epistemological Perspectives

The generation and sustenance of knowledge, including scientific knowledge, is a central preoccupation of classical epistemology. Not only are we individual human beings biologically limited, in terms of our lifespan and our reasoning and experiential abilities, but we are also circumscribed in terms of our historical and geographical location. It follows that we would do well, not least for epistemic reasons, to rely on other people's expertise and testimony, competence, and truthfulness, and of course on constructive criticisms by peers. It is in this sense that social epistemology, understood here as being concerned with the interpersonal and social practices and norms that influence and guide the quest for knowledge and truth, has gained significance and widespread acceptance in recent years.

Christophe Heintz examines the argument that the evolution of science constitutes a specific case of cultural evolution. In doing so, he is critical of the assumption that the evolution of science proceeds through blind variation and selective retention. This assumption, he contends, is at odds with a substantial amount of what is known about both the history of science and scientific cognition. Instead of blind variation and selective retention, Heintz argues that it is "cultural attraction" that enables the stabilization of cultural phenomena: "To understand cultural attraction, one needs to discover the constructive processes that generate new ideas and their interpretations by the scientific community." In their contribution, Stefaan Blancke, Koen Tanghe, and Johan Braeckman revisit the dual role of intuition in science and in the ways that science is communicated, taught, and learnt. On the one hand, science has an intuitive, cognitive foundation. On the other hand, it frequently yields counterintuitive results. This tension, the authors argue, constitutes both a challenge and an opportunity for everyone involved in the dissemination and facilitation of scientific knowledge and concepts. Science educators, for example, are tasked with appealing to people's intuitive understanding through the development of educational tools, practices, and strategies, like engaging imagery, metaphors, and narratives. However, these educational, communicational, and rhetorical tools, methods, and strategies can also prove counterproductive, especially if and when the pertinent scientific concepts, theories, and results are counterintuitive. The authors conclude with some general, illustrative remarks about how teachers should proceed, and what "educational tools and strategies they can deploy to develop a scientific understanding of the world in their students or audience" and, at the same time, "avoid the pitfalls of intuitive reasoning." In the final chapter of the book, Maarten Boudry and Massimo Pigliucci dismiss any suggestion of a stark opposition between the social and the rational. They contend that science, contrary to the classical view, is an inescapably social enterprise, practiced by real persons in real social and cultural contexts. This does not mean, however, that reason and rationality must take a backseat. Reference to both social and rational factors that underlie the development of beliefs about the world is required to account for the epistemic credentials of science.

5 Concluding Comments

A widespread, popular view is that ethnic or cultural groups have their own distinctive epistemologies that epistemologies are also gendered and that these have been largely ignored by the dominant social group. A corollary of this view states that scientific research is pursued within a framework that represents particular assumptions about knowledge and knowledge production that reflect the interests and historical traditions of this dominant group. More often than not, however, in such arguments for different, diverse, alternative, decolonized, or demasculinized epistemologies, some relevant philosophical issues remain unresolved, if not unaddressed altogether. What exactly do claims about epistemological diversity mean? Do these ways of establishing knowledge, including scientific knowledge, stand up to critical interrogation? Moreover, how do they relate to classical epistemological distinctions, e.g., between knowledge and belief and between descriptive and normative inquiry, and to epistemologically essential components like justification and truth?

Given the bad press that science, scientific knowledge, and scientific truth have had in recent decades, following not only the concerted attacks of some postmodernists, poststructuralists, constructivists, and certain feminist theorists but also the gung-ho advocacy by academic conservatives, this book constitutes a fresh approach, a much-needed balanced appraisal of both the significance of culture and the translatability of science. The essays collected in this timely volume eschew both the epistemological and cultural relativism and the all-out universalism associated with their respective warring fronts.

What is arguably missing in this otherwise comprehensive and balanced collection of essays is a discussion of the "intuitive ontologies" underlying ethnoscience and indigenous knowledge (systems), the intuitions governing invocation of, for example, ethnobotany, indigenous medical and veterinary knowledge, African metallurgy, Dogon and Palikur astronomy, Native American archeology, and Aboriginal navigation techniques. Whatever one's take on these notions and phenomena (and mine tends to be a fairly critical one), they deserve to be acknowledged and taken seriously. The editors do refer to folk physics, folk biology, and folk psychology in their introduction, but these references remain scant and, in the body of the volume, somewhat insubstantial.

Having said this, it must be noted that this is really a fairly minor quibble. Rutten, Blancke, and Soetaert have produced an eminently readable and engaging book, a timely collection of essays that will be of great interest and benefit not only to theorists of science, science education, and comparative cultural studies, but also to graduate students, and to science educators working in multicultural and intercultural environments.

Compliance with Ethical Standards

Conflict of Interest The author declares no conflict of interest.