ROUTLEDGE

Knowledge as Social Order

Rethinking the Sociology of Barry Barnes

Edited by

Massimo Mazzotti

KNOWLEDGE AS SOCIAL ORDER

This page intentionally left blank

Knowledge as Social Order

Rethinking the Sociology of Barry Barnes

Edited by

MASSIMO MAZZOTTI
University of Exeter, UK

LONDON AND NEW YORK

First published 2008 by Ashgate Publishing

Published 2016 by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN
711 Third Avenue, New York, NY 10017, USA

Routledge is an imprint of the Taylor & Francis Group, an informa business

Copyright © 2008 Massimo Mazzotti

Massimo Mazzotti has asserted his moral right under the Copyright, Designs and Patents Act, 1988, to be identified as the editor of this work.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Notice:
Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data
Knowledge as social order : rethinking the sociology of
Barry Barnes
1. Barnes, Barry 2. Science - Social aspects 3. Relativity
I. Mazzotti, Massimo
306.4'5

Library of Congress Cataloging-in-Publication Data
Knowledge as social order : rethinking the sociology of Barry Barnes / edited by Massimo Mazzotti.
p. cm.
Includes index.
1. Knowledge, Sociology of. 2. Social structure. 3. Barnes, Barry. I. Mazzotti, Massimo.

HM651.K563 2008
306.4'2--dc22
2007034124

ISBN 978-0-7546-4863-5 (hbk)
ISBN 978-1-3155-9114-8 (ebk)

Contents

List of Figures *vii*
Notes on Contributors *ix*
Acknowledgements *xiii*

Introduction
Massimo Mazzotti 1

1 Relativism at 30,000 Feet
David Bloor 13

2 Relativism: Is it Worth the Candle?
Trevor Pinch 35

3 Who is the Industrial Scientist? Commentary from Academic Sociology and from the Shop-Floor in the United States, ca. 1900 – ca. l970
Steven Shapin 49

4 The Meaning of Hoaxes
Harry Collins 77

5 Objectual Practice
Karin Knorr Cetina 83

6 Producing Accounts: Finitism, Technology and Rule-Following
Donald MacKenzie 99

7 Power and Legitimacy
Mark Haugaard 119

8 Barnes on the Freedom of the Will
Martin Kusch 131

9 Agency, Responsibility and Structure: Understanding the Migration of Asylum Seekers to Ireland
Steven Loyal 147

10 Against Maladaptationism: or What's Wrong with Evolutionary Psychology?
John Dupré 165

Index *181*

List of Figures

Figure 6.1	Extensional semantics and finitism	101
Figure 6.2	White to play and mate in a single move	102
Figure 6.3	Examples of codes in the case-study firm’s chart of accounts	104
Figure 8.1	The main philosophical views on freedom of the will	135

This page intentionally left blank

Notes on Contributors

David Bloor is Professor of Sociology and Director of the Science Studies Unit at Edinburgh University. He has written widely on the Kuhn/Popper debate, the cognitive functions of metaphor, and on the sociology of scientific knowledge and Wittgenstein's philosophy. He is author of *Knowledge and Social Imagery* (Routledge 1976; 2nd edition Chicago Univ. Press 1991); *Wittgenstein: A Social Theory of Knowledge* (Macmillan and Columbia 1983); *Wittgenstein: Rules and Institutions* (Routledge 1997); and co-author (with Barry Barnes and John Henry) of *Scientific Knowledge: A Sociological Analysis* (Athlone and Chicago Univ. Press 1996).

Harry Collins is Distinguished Research Professor of Sociology and Director of the Centre for the Study of Knowledge, Expertise and Science (KES) at Cardiff University. His has worked on the nature of artificial intelligence, publishing two book on the topic: *Artificial Experts: Social Knowledge and Intelligent Machines* (MIT Press 1990) and, with M. Kusch, *The Shape of Actions: What Humans and Machines Can Do* (MIT Press 1998). His main topic is the sociology of scientific knowledge publishing *Changing Order: Replication and Induction in Scientific Practice* (Sage Publications 1985; 2nd edition Univ. of Chicago Press 1992) and, with T. Pinch, a popular series about science and technology which so far has three volumes: *The Golem: What you should know about science* (1993; R. K. Merton book prize); *The Golem at Large: What you should know about technology* (1998) – both books are published by Cambridge Univ. Press and reprinted in their Canto paperback series – and *Dr. Golem: How to Think About Medicine* (University of Chicago Press 2005). In 1997 he was the recipient of the Society for Social Studies of Science J.D.Bernal prize.

John Dupré is Professor of Philosophy of Science at the University of Exeter and Director of the ESRC Centre for Genomics in Society. He has previously taught at Stanford University and Birkbeck College. His research focuses on the philosophy of biology and on the cultural and methodological aspects of scientific research. His books include *The Disorder of Things: Metaphysical Foundations of the Disunity of Science* (Harvard University Press 1993); *Human Nature and the Limits of Science* (Oxford University Press 2001); *Humans and Other Animals* (Oxford University Press 2002); and *Darwin's Legacy: What Evolution Means Today* (Oxford University Press 2003).

Mark Haugaard lectures in Social Theory at the National University of Ireland, Galway, and is the author of numerous publications on power and social theory more generally. These include: *The Constitution of Power* (Manchester University

Press 1997); ‘Power: Social and Political Theories of’ in *Encyclopedia of Violence, Peace and Conflict*, Vol. 3 (Academic Press 1999); *Power: A Reader* (Manchester University Press 2002); (co-ed) *Making Sense of Collectivity: Ethnicity, Nationalism and Globalization* (Pluto Press 2002); and (co-ed) *Power in Contemporary Politics* (Sage 2000). During the academic year 2001–2002, Haugaard was Jean Monnet Fellow at the Department of Politics and Sociology at the European University Institute, Florence.

Karin Knorr Cetina is Professor of Sociology at the University of Kostanz and visiting professor at the University of Chicago. She has authored numerous books in German and English among which *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science* (Oxford University Press 1981); *Epistemic Cultures. How the Sciences Make Knowledge* (Harvard University Press 1999) – winner of the L. Fleck Prize for the best book of the year in social studies of science; and, with A. Preda, *The Sociology of Financial Markets* (Oxford University Press 2004). Among her edited books are *Science Observed: New Perspectives on the Social Study of Science* (Sage 1983) with M. Mulkay; and *The Practice Turn in Contemporary Theory* (Routledge 2001) with T. Schatzki and E. von Savigny.

Professor Knorr Cetina’s contribution to this book has also been published in Theodore Schatzki, Karin Knorr Cetina and Eike von Savigny (eds) (2001), *The Practice Turn*, London: Routledge, 175–188.

Martin Kusch is Professor of History and Philosophy of Science at the University of Cambridge. He previously was Reader in the Science Studies Unit (of the University of Edinburgh) where he succeeded Barry Barnes in 1993. His main book publications are *Psychologism* (Cambridge University Press 1995); *Psychological Knowledge* (Cambridge University Press 1999); *Knowledge by Agreement* (Cambridge University Press 2002); *A Sceptical Guide to Meaning and Rules: Defending Kripke’s Wittgenstein* (Acumen 2006) and, with Harry Collins, *The Shape of Actions* (MIT Press 1998).

Steven Loyal is a Lecturer in Sociology at University College, Dublin. In addition to his interest in sociological theory he has research interests in migration, and ethnic and racial studies. His most recent books have been *The Sociology of Anthony Giddens* (Pluto Press 2003) and *The Sociology of Norbert Elias* (Cambridge University Press 2004) edited with Stephen Quilley.

Donald MacKenzie holds a personal chair in Sociology at Edinburgh University, where he has taught since 1975. His books include *Statistics in Britain, 1865–1930: The Social Construction of Scientific Knowledge* (Edinburgh University Press 1981); *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (MIT Press 1990); *Mechanizing Proof: Computing, Risk, and Trust* (MIT Press 2001); and *An Engine, Not a Camera: How Financial Models Shape Markets* (MIT Press 2006).

Trevor Pinch is Professor of Science and Technology Studies and Professor of Sociology at Cornell University. He has written extensively on the sociology of

technology, and his most recent publications include *Analog Days: The Invention and Impact of the Moog Synthesizer* (Harvard University Press 2002) with F. Trocco; *The Golem at Large: What You Should Know About Technology* (Cambridge University Press 1998) with H. Collins; *The Hard Sell: The Language and Lessons of Street-Wise Marketing* (HarperCollins 1995) with C. Clark; *The Golem: What Everyone Should Know About Science* (Cambridge Univ. Press 1993) with H. Collins; *Dr. Golem: How to Think About Medicine* (University of Chicago Press 2005) with H. Collins; and several edited books.

Steven Shapin is Professor of the History of Science at Harvard University. He held previous appointments as Professor of Sociology at the University of California, San Diego, and at the Science Studies Unit, Edinburgh University. His books include *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton University Press 1985) with S. Schaffer; *A Social History of Truth: Civility and Science in Seventeenth-Century England* (University of Chicago Press 1994); *The Scientific Revolution* (University of Chicago Press 1996; now translated into 14 languages), and several edited books. His awards include the J.D. Bernal Prize of the Society for Social Studies of Science, the Ludwik Fleck Prize for the best book of the year in social studies of science, the Robert K. Merton Prize of the American Sociological Association, and the Herbert Dingle Prize of the British Society for the History of Science.

Professor Shapin's chapter for this book was also published in Karl Grandin, Nina Wormbs, and Sven Widmalm (eds) (2004), *The Science-Industry Nexus: History, Policy, Implications*. Canton, MA: Science History Publications, 337–363.

This page intentionally left blank

Acknowledgements

I thank Annalisa McNamara and Massimiliano Pagani for their aid in the preparation of this book. I'm grateful to numerous friends and colleagues in Exeter and Edinburgh for their comments and advice, and to the contributors, for their patience and availability.

This page intentionally left blank

Introduction

Massimo Mazzotti

For a long time, debates over the nature of knowledge have been informed by an influential general model, according to which knowledge and belief are separated by an insuperable epistemological boundary, belief being knowledge *less* something (warrant, for example). From this perspective knowledge is to be understood as the product of the encounter of the individual mind with reality – social and natural. Logic and evidence alone would determine the contents of knowledge, while the social dimension would mainly enter the picture as a distorting element, as when the analyst identifies the effects of 'social pressures', or the 'weight of tradition'. The theoretical and empirical shortcomings of this approach to the study of knowledge have been fully exposed by decades of anthropological and sociological research. Within the sociology of knowledge an alternative view has taken shape, according to which knowledge/belief is to be understood as essentially related to social action and structure. The debate has thus shifted to questions about the nature of the relationship between belief, action and structure, and the analytic use of these notions; and, indeed, the opportunity to retain a knowledge/belief distinction. Clearly, the way in which these questions are answered is of great import not only for the sociology of knowledge but for social theory as well.

The present volume aims to contribute to current debates in this area by honouring and reflecting upon the work of Barry Barnes. The volume intends to mark at once Barnes's retirement from his current position at the University of Exeter and the fortieth anniversary of his affiliation to the Science Studies Unit at the University of Edinburgh. Barnes's highly original and fruitful insights on the knowledge/power/practice relationship are presented here through ten essays written by scholars from various fields who have been using, developing and challenging those insights. The diversity of these uses, which cut across disciplinary fields and concerns, is in itself a sign of the breadth of Barnes's reflection and of its theoretical import. In fact, although Barnes is mainly known as one of the founders of what today is called science and technology studies, he has always conceived of his own research as dealing primarily with fundamental issues in the social sciences. The aim of this introduction is precisely that of rendering the profound sense of unity that pervades Barnes' varied body of work, and illustrating the way his work bears on basic questions about the interplay between cognitive and social order in any given human collective.

The relationship between structure and belief has been a traditional concern of the sociology of knowledge. The analytic tools used to explore this relationship derive primarily from two bodies of work. The first and most influential is the

work of Karl Marx, in which the relationship between social structure and belief is conceptualised in terms of a materialistic theory of interests. It is the relation to the means of production that, according to Marx, defines the interests of social classes. Class interests in turn determine people's beliefs – although the actual link between class interests and individual interests has proven to be quite difficult to analyse. This basic, mono-directional picture (where social structure influences belief) is complicated by the presence of ideology, which according to Marx distorts the true interests of the working classes, shapes their understanding of the world and favours the reproduction of class-relations. The idea that structure and belief are connected by a complex two-way relationship is therefore already present at the origin of the sociology of knowledge.

A similar image emerged even more sharply in another major tradition of research, constructed around the work of Emile Durkheim. According to Durkheim, categories of thought should be understood as contingent products of a collective's social experience. Scholars within this tradition, such as Mary Douglas, have highlighted the remarkable homologies between social structures and systems of beliefs as documented by anthropological research. However, as Durkheim was aware, the arrow of determination does not point simply from structure to belief. Those very beliefs that are produced through collective action are indeed functional to the sustenance of society and to the reproduction of its institutions.

After a period of relative decline the study of the sociology of knowledge flourished anew in the 1960s, in correspondence with a more general process of re-orientation of the field of social sciences, and especially a rethinking of the nature of social structure and of its relation to collective and individual action. In brief, resources from both the Marxist and Durkheimian traditions were mobilised to question mono-causal, deterministic models for the production of knowledge, and particularly those strains of sociological and anthropological research that had reified – illegitimately, it was now believed – the notion of social structure. The work of such authors as Louis Althusser and Mary Douglas is emblematic of the revival and renewal of the two main traditions during the sixties. More generally, this period saw the strengthening of a more interpretive, interactionist theorisation, which emphasised human agency and the theoretical significance of practice, a shift emblematised by the raise and influence of ethnomethodology. Michel Foucault and Pierre Bourdieu, who were not associated directly with previous traditions in the sociology of knowledge, also played an important role in reshaping the theoretical landscape. Foucault's analysis of power/knowledge proved to be especially suggestive, as it re-framed the debate by focusing on the concrete tools of social control and questioned, through the notion of discourse, the very analytic significance of tools such as structure and belief. Bourdieu's notions of habitus and field also allowed for a rethinking of the relationship between structure and action.

Barry Barnes's early work should be situated precisely within the 1960s theoretical and methodological renewal of the sociology of knowledge. Drawing upon the work of Marx and Durkheim, but also on suggestions from Ludwig Wittgenstein, Mary Hesse, Mary Douglas, Thomas Kuhn and Harold Garfinkel, Barnes and his colleagues at the Science Studies Unit at Edinburgh University initiated a new and distinctive research tradition in the sociology of knowledge, which they called

'the Strong Programme in the sociology of scientific knowledge' (SSK). When the publications of the Edinburgh School, as the group was soon labelled, began to appear in the early seventies, it was immediately clear that the scope of their work went far beyond the traditional concerns of the sociology of knowledge, and had implications for the very basis of social theory. In essence, they showed empirically that cognitive and social order cannot be understood in isolation from each other, even when one analyses the contents of the most esoteric forms of scientific and technical knowledge. During the 1970s the study of science and technology as social activities became, in Edinburgh and elsewhere, the *raison d'être* of a new, specialized field of research initially known as 'science studies'. From the eighties onwards the field has been thriving within the Anglo-Saxon academic world, under the label of science and technology studies (STS), and its maturity has been signalled by a wave of specialized journals and undergraduate textbooks. The rise of STS within academia has been a striking success story. It was so successful that it is now difficult to recall the sense of outrage that the claim could provoke around 1970, even within the social sciences, that scientific knowledge should be studied just like any other kind of belief system. It might be useful then to start from there to sketch a map of Barnes's own contributions to the sociology of knowledge and to social theory.

In 1967, Stanley Barry Barnes joined the Science Studies Unit at the University of Edinburgh as a lecturer. He was employed as a sociologist to teach science and engineering students about their own work considered as social activity and about its wider social significance. David Bloor was similarly employed, and soon Steven Shapin and Donald MacKenzie would join the teaching staff of the unit. Needless to say, the necessity of teaching modules along these lines was far from obvious at the time. But then, the Science Studies Unit was a rather unobvious institution. The unit had begun its activities in 1966, having been set up by a group of prominent Edinburgh scientists led by the biologist Conrad Hal Waddington with the explicit aim of contributing to a bridging of the gap between what Charles Percy Snow had famously called the 'two cultures'. The creation of the unit was inspired by the Scottish tradition of providing scientists with a broad education, and its main aim was to open science up to social responsibility, which at the time was understood primarily in terms of the scientist's awareness of the social implications of their work. Waddington's vision of science and its role in society was derived from a lively Marxist tradition that aimed to free western science from the control of capitalist priorities and bring it closer to the people's real needs. A very similar agenda would soon find institutional expression in the British Society for Social Responsibility in Science (1971). It remained unclear, in this as in other traditions of a socialist sociology of science, if and how the political meaning of science should change our understanding of the notion of scientific objectivity (and hence of ideology) and our interpretations of the very contents of scientific knowledge. In any case, in 1966 a committee chaired by Waddington decided that science and engineering students should have the opportunity to take modules that would raise their awareness of the social and political implications of science and technology. David Edge was appointed as first director of the unit; he was a radio astronomer with a keen interest in science communication who had been working for the Science Unit at the BBC since 1959. Apparently Waddington told Edge: 'we'll teach them the science, you'll

teach them the rest' (Bloor 2003). In a few years 'the rest' turned out to be a new and promising field of research: science studies.

In constructing genealogies and myths of origins we tend to emphasise those aspects of the object in question that we deem essential. In my sketchy reconstruction of the origins of the Edinburgh School I have done exactly this. I would like to emphasise two points: first, its roots in the work of Marx and Durkheim, and secondly its prominent connection with the world of practicing scientists, especially biologists and physicists. The first point is relevant as it provides the context in which the long-lasting commitment to the materialist assumptions that characterise the Edinburgh School took shape, and especially Barnes's 'minimal realism'.[1] At the same time these assumptions also have to do with the second point, i.e. the belief that science should be studied primarily through the careful observation of actual every-day scientific practice.

The members of the unit began studying science as it is practiced, rather than as it ought to be. When contrasted with the ethereal worlds of 1960s philosophy of science or the institutional imperatives of Mertonian sociology, the early works of the Edinburgh School appear strikingly different, immersed as they are in the messy reality of experimental life. They certainly looked more like works in ethnography and historical anthropology than in philosophy. It is probably relevant that, unlike most philosophers and sociologists studying science at that time, Barnes and other members of the Edinburgh School were trained in the natural sciences. This might indeed explain their sharp perception of previous theories of scientific knowledge as irredeemably idealistic. Thus Barnes had read chemistry and was familiar with laboratory practice in this field (Barnes and Symons 1966; 1970a), while Bloor had done research in experimental psychology and Shapin, the historian of the group, had been trained in genetics, and collaborated closely with the Edinburgh Medical School while writing his groundbreaking articles on the history of phrenology (Shapin 1975). The enormous influence of this methodological revolution – looking at what scientists do rather than at what they, or philosophers, say – is testified to by the fact that this move would soon become obvious and unproblematic. This basic hands-on attitude shaped the methodological tools deployed in the works of the Edinburgh School. For them, the empirical exploration of scientific practices should itself be shaped by what natural scientists do and the way in which they orient themselves to what they study. Again, today it might be rather difficult to grasp the radical nature of this choice, its radical rupture with existing traditions in the study of scientific knowledge. In opposition to the then dominant rationalistic and idealistic perspectives, Barnes and Bloor defined their attitude as 'naturalistic'.

The conviction that the discipline of sociology would benefit from being informed by the methodology of the natural sciences was still relatively popular in the early 1960s, although on the wane. Interestingly, Barnes's own postgraduate study in sociology had been possible thanks to a programme of the Social Science Research Council specifically designed to attract science-trained students to the social sciences. The limits of this form of scientific sociology, however, were becoming all

1 On Barnes's minimal realism see Barnes 1992a, where this position is presented and contrasted to stronger and more familiar kinds of realism.

too evident. Essentially, the idea that the methods of the natural sciences should also inform the social sciences was combined with misconceived notions of what those methods were. The sociological imagination of the 1960s was still very much permeated by a rationalistic account of science and scientific objectivity, shaped by the works of such philosophers as Karl Popper, who saw scientific knowledge as the product of the encounter of the individual mind with external reality, mediated by the rules of an alleged universal logic. While the rest of the social world was being boldly explored and deconstructed through new interpretive and phenomenological approaches, the world of science appeared thus frozen in an anachronistic, sui generis status that exempted it from any kind of social analysis – as if scientific practices were not social practices themselves. In Barnes's opinion this special status – which paralleled that traditionally ascribed to theology – was the result of an unscientific attitude. In Edinburgh he thus began re-conceptualising the relationship between natural and social sciences in a way that went beyond the traditional, and at that point sterile, dualistic model. Barnes agreed that science should be studied scientifically. However, he also believed that social scientists were using a misleading model of how science actually works. This model needed to be freed from its idealistic and rationalistic components. What social scientists could certainly import from science was a fundamental attitude shared by natural scientists, i.e. naturalism. Rather than trying to offer some necessarily unsatisfactory definition of naturalism, Barnes suggested that the modus operandi of the natural scientists should be observed, alongside the basic assumptions that frame their interaction with the world, and the way in which they orient themselves to the world and to each other when they produce knowledge. Using a Kuhnian image, he suggested that exemplary scientific work incarnated the naturalistic attitude he was advocating. The first step towards a properly scientific sociology of knowledge consisted of importing to this field of inquiry the naturalistic attitude and realist presuppositions of practicing scientists. The adoption of such a perspective made it apparent that science should be analysed sociologically in just the same way as any other social activity. This meant challenging the dominant dualistic perspective on knowledge, and promoting a naturalistic and monistic sociology of knowledge instead. Barnes's naturalistic commitment thus provided the basis for the development of that particular form of relativism that was soon to be become associated with the Edinburgh School (Barnes and Bloor 1982).

After a few articles on the sociology of scientific beliefs and an empirical study of social dynamics of industrial research (Barnes 1969; 1971; Barnes and Dolby 1970), Barnes edited *Sociology of Science* (Barnes 1972), a groundbreaking reader that signalled the thriving status of the field. Barnes's own contribution to this volume marked the start of his interest in the social construction of expert credibility, a line of research that was openly discouraged by policy-makers at the time (Barnes 1972a).[2] The view of science as an essentially social activity was summarised in *Scientific Knowledge and Sociological Theory* (1974), Barnes's first major contribution to social theory. Here Barnes mobilised a variety of theoretical and empirical materials in defence of this monistic position and engaged with dualist approaches of various

2 For Barnes's more recent work on expert credibility, see Barnes 1999, 2002b, and 2005a.