

OPENING
PANDORA'S BOX

A sociological analysis of scientists'
discourse

G. NIGEL GILBERT AND MICHAEL MULKAY

The physicist Leo Szilard once announced to his friend Hans Bethe that he was thinking of keeping a diary: 'I don't intend to publish it; I am merely going to record the facts for the information of God.' 'Don't you think God knows the facts?' Bethe asked. 'Yes', said Szilard. 'He knows the facts, but he does not know *this version of the facts*.'

Freeman Dyson, *Disturbing the Universe* (Preface)

OPENING PANDORA'S BOX

A Sociological analysis of scientists' discourse

G.NIGEL GILBERT

Lecturer in Sociology, University of Surrey and

MICHAEL MULKAY

Professor of Sociology, University of York

Originally published by

CAMBRIDGE UNIVERSITY PRESS

Cambridge

London New York New Rochelle

Melbourne Sydney

<<iv>>

Published by the Press Syndicate of the University of Cambridge
The Pitt Building, Trumpington Street, Cambridge CB2 1RP
32 East 57th Street, New York, NY 10022, USA
296 Beaconsfield Parade, Middle Park, Melbourne 3206, Australia

© Cambridge University Press 1984
© Nigel Gilbert and Michael Mulkey 2003

First published 1984
Published on the web 2003

Originally Printed in Great Britain at the University Press, Cambridge

Library of Congress catalogue card number: 83-5338

British Library Cataloguing in Publication Data

Gilbert, G. Nigel
Opening Pandora's Box.
1. Science-Social aspects
I. Title II. Mulkey, Michael
306'.45 Q175.5

ISBN 0 521 25418 3 hard covers
ISBN 0 521 27430 3 paperback

<<v>>

Note: the original pagination of the printed book is shown in angle brackets, thus: <<23>>

Contents

<i>Acknowledgements</i>	<i>page</i> vi
Preface	vii
1 Scientists' discourse as a topic	1
2 A possible history of the field	18
3 Contexts of scientific discourse	39
4 Accounting for error	63
5 The truth will out	90
6 Constructing and deconstructing consensus	112
7 Working conceptual hallucinations	141
8 Joking apart	172
9 Pandora's bequest	188
<i>Notes</i>	192
<i>Index</i>	200

<<vi>>

Acknowledgements

Thanks are due to authors and publishers for permission to reproduce illustrations: from J. B. Finean, R. Coleman and R. H. Michell, *Membranes and Their Cellular Functions*, Blackwell Scientific Publications, Oxford (pictures I and IX); from A. L. Lehninger, E. Carafoli and C. S. Rossi, 'Energy-linked ion movements in mitochondrial systems', *Advances in Enzymology* 29 (1967), Wiley Interscience, New York (picture II); from S. J. Edelman, *Introductory Biochemistry*, Holden-Day, Calif. (picture III); from P. Mitchell, *Biological Reviews* 41 (1965), Cambridge University Press (picture IV); from M. D. Brand, 'The stoichiometric relationships between electron transport, proton translocation and adenosine triphosphate synthesis and hydrolysis in mitochondria', *Biochemical Society Transactions* 5 (1977), the Biochemical Society (picture V); from M. J. Selwyn and A. P. Dawson, 'Model membranes and transport systems', *Biochemical Society Transactions* 5 (1977), the Biochemical Society (picture VI); from P. Hinkle and R. McCarty, 'How cells make ATP', *Scientific American*, March 1978, 238, no.3 (pictures VII and VIII).

Preface

The research reported in this book was conceived when a scientist friend showed us a copy of a letter written by a biochemist which seemed to indicate by its tone that there was a raging and, so we thought, sociologically interesting controversy going on in an area of biochemistry called 'oxidative phosphorylation'. Like other sociologists of science, and like our scientist friend, we assumed that part of the job of the sociologist was to strip away the formal side of science, and show what was *really* going on; an area of lively debate would, we thought, be an excellent site for such investigations.

The Social Science Research Council agreed with us, and funded a three-year research programme (HR5923) which took us around Britain and across the United States to visit and talk with the scientists who were working on oxidative phosphorylation and related topics. As we travelled, in train compartments and airport departure lounges, and especially in Howard Johnson motel rooms, we discussed together what we were hearing, and realised that although we were being given quite different accounts of what 'really was happening' by different interviewees, they *all* seemed to be plausible and, indeed, convincing. It gradually became clear that we needed to employ rather different methodological assumptions and forms of analysis from those that we had been used to in order to make any sociological sense of these data. We had to learn how to deal with variability in our accounts, in a way that recognised that the variability was not just a methodological nuisance, but was an intrinsic feature which we needed to exploit in our analyses. 'Pandora's Box' is our metaphor for the conflicting voices that spoke to us. We shall show that, nevertheless, we have been able to find order in their diversity.

Many people have helped us in our research, not least the scientists who remain anonymous in the book, but to whom we are grateful for their hospitality and kindness in talking to us. Robert Reid and Barry Gould helped us to learn the rudiments of biochemistry. Sarah Domanski did invaluable work gathering the research literature of the field. Henry Small, and the Institute for Scientific Information, provided citation data as well as entertaining us royally in Philadelphia. We must also thank Stella

<<viii>>

Edison, Hilary Minor, Sue Plummer and Sarah Rollason for typing this manuscript and for helping with the difficult task of transcribing interview tapes of scientists talking in strange accents about their research. Jonathan Potter and Steven Yearley helped us to refine our ideas and to do justice to the intricacies of the data. Finally, we should like to thank the international community of sociologists of science, without whose arguments and objections this research would have been easier, but much less fun.