

PHILOSOPHY OF SCIENCE

*Official Journal of the Philosophy of
Science Association*



VOLUME 58, NUMBER 3

September, 1991

PHILOSOPHY OF SCIENCE

(ISSN 0031-8248)

JOURNAL OF THE PHILOSOPHY OF SCIENCE ASSOCIATION

EDITORIAL BOARD:

MERRILEE H. SALMON, *Editor-in-Chief*

PETER MACHAMER AND JOHN D. NORTON, *Associate Editors*

PETER ACHINSTEIN
FRANK ARNTZENIUS
PETER ASQUITH
JOHN BEATTY
JEFFREY BUB
RICHARD BURIAN
ROBERT BUTTS
NANCY CARTWRIGHT
LINDLEY DARDEN
JOHN EARMAN
ARTHUR FINE
JERRY FODOR
MICHAEL FRIEDMAN
STEVE FULLER

RONALD GIERE
CLARK GLYMOUR
GARY GUTTING
IAN HACKING
WILLIAM HARPER
GEOFFREY HELLMAN
DAVID HULL
PAUL HUMPHIREYS
PHILIP KITCHER
HENRY KYBURG, JR.
JAMES G. LENNOX
DAVID MALAMENT
TIM MAUDLIN
DEBORAH MAYO

THOMAS NICKLES
ILKKA NIINILUOTO
ALEXANDER ROSENBERG
MICHAEL RUSE
KENNETH SCHAFFNER
DUDLEY SHAPERE
LAWRENCE SKLAR
BRIAN SKYRMS
FREDERICK SUPPE
PATRICK SUPPES
BAS VAN FRAASSEN
LINDA WESSELS
JAMES WOODWARD

ASSISTANT EDITOR:

Judith Meiksin

EDITORIAL ASSISTANT:

Robert T. Pennock

GOVERNING BOARD OF THE ASSOCIATION:

Thomas S. Kuhn, President (1990)

Bas C. van Fraassen, President-elect (1990)

Arthur Fine, Past President (1990)

John Earman (1991)

Michael Friedman (1990)

Daniel Garber (1991)

William Harper (1991)

Philip Kitcher (1990)

Brian Skyrms (1990)

Paul Teller (1990)

William Wimsatt (1991)

EXECUTIVE SECRETARY:

Peter D. Asquith

MADE AND PRINTED IN THE USA BY
EDWARDS BROTHERS, INC., ANN ARBOR, MI

PHILOSOPHY OF SCIENCE is published quarterly by the Philosophy of Science Association, 18 Morrill Hall, Department of Philosophy, Michigan State University, East Lansing, Michigan 48824. 1991 Subscription price \$50.00 U.S.A. (\$55.00 non-U.S.A.) per Volume. Single numbers \$15.00. 1991 Membership dues, which include subscription, are graduated based on income: income below \$40,000—\$40.00; \$40,000—\$49,999—\$50.00; \$50,000 or above—\$60.00. Subscription inquiries should be directed to the Executive Secretary. Second-class postage paid at East Lansing, Michigan and at additional mailing offices. © 1991 by the Philosophy of Science Association.

CONTENTS*

QUANTUM THEORY AND EXPLANATORY DISCOURSE: END-GAME FOR UNDERSTANDING?, JAMES T. CUSHING	337
LÜDERS'S RULE AS A DESCRIPTION OF INDIVIDUAL STATE TRANSFORMATIONS, SERGIO MARTINEZ	359
EINSTEIN AND EPR, ROBERT DELTETE AND REED GUY	377
TEMPORALLY ASYMMETRIC INFERENCE IN A MARKOV PROCESS, ELLIOTT SOBER	398
THE NEW THEORY OF REFERENCE ENTAILS ABSOLUTE TIME AND SPACE, QUENTIN SMITH	411
THE UNITS OF SELECTION AND THE BASES OF SELECTION, DAVID WALTON	417
ON THE NOTION OF EVOLUTIONARY PROGRESS, KAI HAHLWEG	436
A CASE OF "QUALITATIVE CONFIRMATION" FOR THE SOCIAL AND BEHAVIORAL SCIENCE, STEVEN I. MILLER AND MARCEL FREDERICKS	452
REALISM, EMPIRICISM AND SCIENTIFIC REVOLUTIONS, PATRICK ENFIELD	468
CRITERIA OF RATIONALITY AND THE PROBLEM OF LOGICAL SLOTH, ANDRE KUKLA	486
DISCUSSION: GOLDSTICK AND O'NEILL ON "TRUER THAN", ILKKA NIINILUOTO	491
DISCUSSION: THE NEUROBIOLOGY OF OBSERVATION, DANIEL GILMAN	496

*The contents of PHILOSOPHY OF SCIENCE are utilized in compiling the following bibliographic sources: *Arts and Humanities Citation Index*; *Biological Abstracts*; *Bulletin Signalétique 519*; *Current Contents/Arts and Humanities*; *Current Contents/Social and Behavioral Sciences*; *Current Index to Statistics*; *Humanities Index*; *Index to Book Reviews in the Humanities*; *Isis Critical Bibliography*; *Language & Language Behavior Abstracts*; *Mathematical Reviews*; *Philosopher's Index*; *Philosophie*; *Psychological Abstracts*; *Repertoire Bibliographique de la Philosophie*; *Social Sciences Citation Index*; *Sociological Abstracts*.

BOOK REVIEWS	503
<i>Incompleteness, Nonlocality and Realism</i> , Michael Redhead—Richard A. Healey; <i>James Clerk Maxwell and the Theory of the Electromagnetic Field</i> , John Hendry—Margaret Morrison; <i>Beamtimes and Lifetimes: The World of High Energy Physics</i> , Sharon Traweeek—Sal Restivo; <i>Philosophy of Biology Today</i> , Michael Ruse—Marga Vicedo.	
BOOKS RECEIVED	510