

**THE PROBLEM OF RATIONALITY IN SCIENCE
AND ITS PHILOSOPHY**

BOSTON STUDIES IN THE PHILOSOPHY OF SCIENCE

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VOLUME 160

THE PROBLEM OF RATIONALITY IN SCIENCE AND ITS PHILOSOPHY

*On Popper vs. Polanyi
The Polish Conferences 1988–89*

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SPRINGER-SCIENCE+BUSINESS MEDIA, B.V.

Library of Congress Cataloging in Publication Data

The Problem of rationality in science and its philosophy : on Popper vs. Polanyi, the Polish conferences 1988-89 / edited by Józef Misiek.

p. cm. -- (Boston studies in the philosophy of science ; v. 160)

Includes index.

ISBN 978-94-010-4206-2 ISBN 978-94-011-0461-6 (eBook)

DOI 10.1007/978-94-011-0461-6

1. Science--Philosophy--Congresses. 2. Rationalism--Congresses. 3. Popper, Karl Raimund, Sir, 1902- --Congresses. 4. Polanyi, Michael, 1891- --Congresses. I. Misiek, Józef. II. Series.

Q174.B67 vol. 160

501--dc20

94-17897

ISBN 978-94-010-4206-2

Printed on acid-free paper

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Originally published by Kluwer Academic Publishers in 1995

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JÓZEF MISIEK

PREFACE

Rationality of science was the topic of two conferences (held in 1988 and 1989) organized by the Department of Philosophy of Science, Institute of Philosophy, Jagiellonian University. Both conferences included a small group of invited speakers. This book contains a selection of papers presented there. It is intended mainly for specialists in the philosophy of science and scientists interested in philosophy. Students and especially postgraduate students would also benefit from reading it.

The first conference, 'Popper, Polanyi and the Notion of Rationality', was held from 1 to 5 October 1988 in Janowice. The second conference, 'The Aim and Rationality of Science', was held in Cracow at the Jagiellonian University, from 4–10 June 1989.

The topics of both conferences were inspired by our late friend Dr. Tomasz Kocowski, who many years earlier invited me and my colleagues from the Department to participate in research concerning the problem of creativity, and serve him and other psychologists as methodological advisors. Personal contacts with this intelligent and inquisitive man helped us to realize that we could not fulfill our task while adhering to the received view in the philosophy of science. This experience helped us to see science not only as scientific knowledge but also as a process of research. We then turned our attention to Michael Polanyi, who seemed to provide the philosophy we were looking for.

Organizing conferences in a communist country was a special task which would have been impossible to perform without the friendly cooperation of my colleagues from the Department. I want to thank especially Doc. Dr Hab. Zdzisław Piątek and Dr. Janusz Płazowski.

The first conference was supported by the Polish Ministry of Higher Education. The second was sponsored by the Latsis Foundation, due to the kind recommendation of Prof. John Watkins from the London School of Economics. I would like to express my gratitude to him and both institutions.

It is a pleasure to thank the general editor of the *Boston Studies*, Prof. Robert S. Cohen, for his encouragement, for securing anonymous referees of the manuscripts, and for substantial contribution to the editing of manuscripts. I am much in debt to Annie Kuipers of Kluwer Academic Publishers for her

guidance of and patience with the inexperienced editor.

Dr. Marek Suwara provided much needed linguistic help during the editorial process, and Dr. Janusz Płazowski was very helpful in dealing with computer problems.

Last but not least, my special thanks to all participants of both conferences for bringing with them their own original ideas, discussing problems in a friendly but demanding atmosphere, and postponing publication of their contributions until the date of printing of the present volume.

Kraków
November 1993

Józef Misiek

INTRODUCTION

The papers presented here come from two conferences, both concerning the problem of rationality. The choice of this topic reflects the general opinion among specialists that rationality is a crucial problem in the philosophy of science. What is unusual is the fact that the first conference, 'Popper, Polanyi and the Notion of Rationality' was intended as a confrontation between practitioners of the standard approach to philosophy of science, personalized by the name of Karl Popper, and the unorthodox approach inspired by Michael Polanyi.

The second conference gathered many leading philosophers from abroad. It can be seen as a review of leading tendencies concerning the problem of rationality and related problems in the philosophy of science.

Most of the papers in this volume may be divided into two types, named after the philosophies that inspired the views: the Popperian view and the Polanyi-inspired position. One should stress that none of the papers represents a dogmatic attitude, but rather attempts some kind of improvement of the particular position adopted.

Let us start our survey from the Polanyi-inspired papers. Prof. Cattani, attempting a better understanding of Polanyi's philosophy, puts it in the broader context of the rhetorical tradition in philosophy taken in its ancient rational dimension. Analysis of the Polanyi's notion of rationality relates well with remarks concerning the political implication of this philosophy. Prof. Scott uses a strategy similar to Cattani's. He analyzes Polanyi's philosophy in the broader context of combat, against both scientism and totalitarian attitudes in social philosophy. As a result we obtain a very clear picture of Polanyi's philosophy.

Prof. Zyciński attempts to show that the alleged irrationalism of Michael Polanyi's philosophy is a misunderstanding. He even claims that between the Scylla of dogmatic rationalism of positivist provenience, and the Charybdis of relativism, one has to work out a new epistemology stemming from both Popper's and Polanyi's contributions to philosophy.

A similar conclusion follows from the paper 'Personal Rationality' written by the present writer. This paper offers comparisons between Popper and Polanyi and attempts to show that some of Popper's formulations resemble

Polanyi's theses. The second paper by the same author, 'Assessment of Theories', pertains to the Polanyi-oriented analysis of the assessment of special relativity. In view of historical facts, the paper proposes to distinguish notions of egalitarian and elite rationalities.

The last paper to show some influence of Polanyi is by Dr. Werszowiec Płazowski. He adopts a very broad context to discuss the problem of rationality, that of the whole culture. Within such a context Płazowski tries to overcome the Popperian dichotomy of science and metaphysics, and comes to the conclusion that theory without facts is empty and theory without metaphysics is dead.

The more numerous group of papers presents different versions of Popper's inspiration. Prof. Agassi puts the problem of rationality of knowledge *vis-a-vis* rationality of social order. He makes clear that both kinds of rationality are necessary for mankind to survive. His conclusion is that no theory of rationality offers a proper solution to this problem.

Prof. D'Agostino presents an interesting counter-proposal to Prof. Watkins's solution of the problem of rationality.¹ According to him rationality of science should not be connected with the aim of science, as Watkins claims, but rather with commitment to some specific rules of behavior: rationality is not teleological but deontological. It is worth noting that both ideas involve personal aspects of science, which seems to be against the Popperian tradition but perfectly matches the Polanyian one.

Another criticism of Watkins² comes from Prof. Krajewski. Krajewski accepts the essentials of Watkins's proposal but finds it necessary to modify the particular set of claims accepted by his opponent. One such modification follows from the postulate of realism. A similar position is taken by Prof. Boyer who argues that some of Watkins's aims of science should be abandoned unless realism is not postulated by the second philosopher.

There are papers which are influenced by the Popperian school. Dr. Grabińska finds difficulties in the Lakatos-Zahar reconstruction of two research programs pertaining to the problem of the electrodynamics of moving bodies. One of them, Einsteinian, is well known. The second, developed by H.E. Ives, is known only by specialists. The paper makes a direct assault on the Lakatosian notion of rationality. Prof. Piątek's paper has a similar orientation, she focuses on the problem of rationality in Darwin's theory in light of Popper's thesis that it is not a theory but only a metaphysical research program. Piątek finds interesting arguments against Popper's thesis.

Prof. Watkins's contribution attempts to make the notion of theory more precise in order to clarify the concept of scientific progress. The latter concept

has direct bearing on the concept of rationality. Watkins assumes understanding of a theory as axiomatised (even formalized). The problem is solved in terms of Weisberg's requirement.

Dr. Zabierowski analyses Popper's dichotomy subjectivism-objectivism and confronts it with contemporary science. He finds that the dichotomy does not hold and a third element must be introduced: anthropism. There is also a paper criticizing the sociobiological theory of knowledge, written by Prof. Zyciński. The author shows that the sociobiological theory of knowledge in Ruse's version is incompatible with rationality.

Other papers can not be assigned among either the first or the second group. Each of them makes a separate group. Prof. Armstrong's proposal is, in order to make induction rational, to count it as a particular species of abduction pertaining to properties of things that are universal. Prof. Churchland starts from a neurocomputational perspective (a branch of artificial intelligence adopting parallel processing). The paper offers an interesting account of the concept of explanation. But it gives more. It also offers a general concept of rationality quite close to that of Polanyi. Even the concept of tacit knowledge is included. It is modeled by a configuration of synoptic weights in a neural network, a configuration never defined by the research worker but acquired by the network during the process of training. Prof. Przełęcki's paper presents a very able and crystal clear defense of the received view. Going against the main current, he criticizes some objections raised against the received view pertaining to the problem of interpretation of the theory's language. Prof. Musgrave is engaged with the problem of scientific realism. Adopting a metaphysical approach, he offers able arguments against contemporary objections to realism. In particular he criticizes those presented by Nancy Cartwright in her book *How the Laws of Physics Lie*. Prof. Tempczyk applies recent discoveries in the theory of dynamical systems in order to show that classical mechanics is far from deterministic.

It is interesting to notice the substantial overlap of ideas among many papers. Thus, for example, the main concept discussed in Popperian papers is the notion of the aim of science. Such an idea clearly goes beyond the limits of objective knowledge and introduces a personal dimension to the philosophy of science. Thus the Popperian school takes a step toward the Polanyian tradition.

Another interesting feature of many papers is more or less explicit rejection of the sentential conception of knowledge, rejection of logic as the sole legitimate tool of philosophical analysis, emphasis on understanding knowledge not just its syntactic features. The most striking, however, is more or less tacit

acceptance of the concept of tacit knowledge. It can be clearly seen in Popper-oriented papers but is most perspicuous in Churchland's approach.

Another interesting phenomenon exhibited by most papers in the volume is the strong attack, coming from different positions, on the received view. This attack differs from the well-known 'revolutionary' philosophy of Kuhn and Feyerabend in that it offers specific proposals for how to develop philosophy of science, proposals much more concrete than 'anything goes'. It is reassuring to see that the combat with the 'received view' and the neopositivist heritage is not at all nihilistic as it used to be. On the other hand, the received view is still alive as some papers show. The confrontation between these different approaches results in an intellectual ferment which can be considered fruitful for philosophy of science. All philosophers of science who are open-minded will find many stimulating, even if unorthodox ideas, in the present volume. And this is probably its most important feature.

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NOTES

¹ John Watkins, *Science and Scepticism*, Princeton University Press, 1984.

² *Ibid.*