

CREATIVE TENSION

MICHAEL HELLER

CREATIVE
TENSION

ESSAYS ON SCIENCE AND RELIGION

TEMPLETON FOUNDATION PRESS
PHILADELPHIA AND LONDON

Templeton Foundation Press
Five Radnor Corporate Center, Suite 120
100 Matsonford Road
Radnor, Pennsylvania 19087
www.templetonpress.org

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Designed and typeset by Kachergis Book Design
Printed in the United States by Versa Press

Library of Congress Cataloging-in-Publication Data

Heller, Michael.

Creative tension : essays on science and religion / Michael Heller.
p. cm.

Includes bibliographical references and index.

ISBN 1-932031-34-0 (pbk. : alk. paper)

1. Religion and science. I. Title.

BL240.3 .H45 2003

261.5'5—dc21

2003012637

03 04 05 06 07 10 9 8 7 6 5 4 3 2 1

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FOREWORD

Among those scholars who foster interdisciplinary dialogue between religion and science, two basically different styles of research have been practiced by scientists and by philosophers. The members of the first group feel at home with the mathematical formalism of new scientific theories but when they try to determine the philosophical significance of these theories their comments very often become naive and arbitrary. The representatives of the second group frequently focus their attention on methodological principles and logical distinctions but they know the essence of scientific procedures mainly from popular reports on new discoveries in physics or biology.

There are a few contemporary authors who are skillful enough to use the sophisticated language of modern mathematics and to assess competently the differences between, for instance, Augustine and Aquinas in their understanding of evil. According to historians, Leibniz was the last intellectual authority who comprehended the entire knowledge of his epoch. It was he who dreamt of a *mathesis universalis*—a universal mathematized language in which all philosophical problems could be formulated and solved. Professor Michael Heller does not share old Leibnizian dreams because he knows well the consequences of Kurt Gödel's incompleteness theorem that rules out finding a nontrivial logical system in which all questions could be answered. Nonetheless Heller's original contributions are appreciated both in physics and in ontology. His papers can be found not only in such scientific periodicals as the *Journal of Mathematical Physics* or *General Relativity and Gravitation* but also in philosophical *Festschriften* dedicated to Wittgenstein or Teilhard de Chardin.

In his contributions to physics, the author of *Creative Tension* organized in Cracow a group of talented and young collaborators who originated their joint research by discussing the problem of initial singularity in cosmological models.¹ This very problem inspired long-lasting philosophical debates about whether the initial cosmological

1. In long-distance cooperation this group was transformed into the Cracow Group of Cosmology.

singularity could be regarded as the absolute zero of time. In continuing this research, Professor Heller tries to use the so-called noncommutative geometries as a new language in which one could describe both quantum and cosmological phenomena providing a new paradigm for unity in physics. In philosophy, he develops novel ideas to present a new version of Plato's ontology; the rational structure of reality that could be described in the language of mathematics seems for him much more important than the physical substratum. Consequently, in his ontological version of the so-called formal field theory, he argues that the world of observable physical parameters belongs to the domain of Platonic shadows, while the essence of reality is constituted of abstract relations and formal structures that can be described only in the language of sophisticated mathematics.

Michael Heller's fascination with religion originated in Siberia where, as a child, he was in exile with his family during World War II. Immediately before the war, his family lived in the eastern part of Poland, which was occupied in September 1939 not by the Nazis, but by the Soviet Army. Born in 1936, he returned to his native Poland after the end of the war, when he was nine years old. The struggle for survival in the severe conditions of Siberian life, as well as his personal experience of the important role of religion in such conditions, directed the attention of the young boy to religious issues. He knew that many people survived the extreme Siberian situation because they found in prayer both their spiritual force and their will to survive. His main dream after coming back to Poland was to become a priest and to help people in finding solutions to the most basic problems of life.

Science turned out to be his second intellectual fascination. When after his priestly ordination he undertook philosophical studies at the Catholic University of Lublin, he subsequently developed his own style of doing philosophy in interdisciplinary dialogue with modern science. His attention focused upon such issues as the very beginning of the universe, cosmic evolution, the nature of time, the existence of mathematical objects, and the preconditions of using mathematics in the description of physical processes. His close cooperation with prominent scientists, as well as his own creative efforts, resulted in his quickly becoming well known as one of the best European cosmologists and an outstanding philosopher who consistently tries to develop philosophy in the context of new scientific discoveries.

Heller's attempt to foster dialogue between science and religion grew up in the specific situation of the totalitarian system in which Marxism was officially recognized as the only "scientific philosophy." Ideological protection for philosophical systems very often results in skeptical distrust toward the protégé; scientists in Poland also displayed total distrust toward Marxism. When genetics

and cybernetics were criticized by the Communist Party functionaries as pseudoscience and Niels Bohr's interpretation of quantum mechanics was rejected by Soviet academics as reactionary, there was among the Polish scientists a natural openness to the philosophical implications of scientific theories that could be defined without ideological bias. At that time the Church created a sphere of freedom where alternatives to the Marxist interpretations of scientific discoveries were freely discussed.

Already in the 1960s the then Archbishop of Cracow, Karol Wojtyła, expressed his support for this kind of research. From time to time, he used to invite to his episcopal residence scientists, philosophers, and theologians to discuss with them such topics as the ethical issues generated by new scientific technologies or the role of physical theories in reinterpreting the classical Thomistic arguments for the existence of God. In October 1978, when Cardinal Wojtyła was elected the Pope and had to remain in Rome, Michael Heller took care of this interdisciplinary group and continued its meetings, organizing them systematically once a month. When social transformations, inspired by the rise of "Solidarity," facilitated international contacts, many prominent scholars from the West were invited to take part in the Cracow interdisciplinary seminars. Among those who at that time visited Copernicus's city to discuss the philosophical and theological importance of modern science were Arthur Peacocke (Oxford), John Polkinghorne (Cambridge), Charles Misner (Maryland), Ernan McMullin (Notre Dame, Indiana), William Wallace (Washington, D.C.), Jean Ladrière (Louvain) and Carl Friedrich von Weizsäcker (Germany).

In records kept by those who systematically attended the interdisciplinary meetings that were still held in the residence of the Archbishop of Cracow, the most interesting stories deal with the period of martial law (1981–82). There was a day when special militia troops, similar to the antiterrorist groups in the West, attacked the Solidarity demonstration in Cracow's Old City. Tear gas was used and military vans blocked the entrance to the Main Square—the area where the residence of Cracow's bishops is situated. Despite this warlike landscape, many people decided to pass through the military checkpoint to enter the forbidden area, where on that day the philosophical consequences of Bell inequalities in quantum mechanics were discussed. The historic transformations of 1989 show that creative independent thought cannot be silenced, even by antiterrorist troops. The power of logic demonstrated its superiority in relation to the political power that used terror and violence.

Regardless of the exotic social context of the growth of Heller's ideas, in his philosophy one finds the most important classical issues discussed in the context of new scientific debates. In this philosophical fraternity one finds new

forms of the old ideas that were developed by Plato and Leibniz, Popper, Penrose, and many contemporary searchers for unity in physics. Heller's ontological views seem close to the ideas shared by J. D. Barrow when he claims: "The ultimate laws of Nature may be akin to software running upon the hardware provided by elementary particles and energy. The laws of physics might then be derived from some more basic principles governing computation and logic."² This rational constituent of nature, expressed in the unreasonable effectiveness of the universal language of mathematics in describing physical phenomena, inspired many authors to ask philosophical questions. Their echo can be found in Albert Einstein's comments on the universal laws of physics and in the neo-Platonic concept of cosmic Logos. Both these traditions are combined in Heller's *Creative Tension* resulting in an intellectual adventure where science, philosophy, and theology are united in an attempt to answer the basic questions of our existence.

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2. J. D. Barrow, "Theories of Everything," in *Nature's Imagination: The Frontiers of Scientific Vision*, ed. J. Cornwell, Oxford: Oxford University Press, 1995, 62.

PREFACE

There are two human activities that require no more and no less than the total life commitment if one wants to pursue them adequately, namely, religion and science. This is so not because each of these activities leaves no time for doing something else, but because neither of them tolerates any rivals. To be truly religious and faithfully scientific requires total commitment.

Nevertheless, it happens, from time to time, that both of these activities meet in a single person. In such a case, the question imposes itself: Is it possible to be a religious person and, at the same time, a good scientist? How does one totally dedicate a single life to two such different and such demanding activities? It seems that there is only one solution to this apparently unsolvable situation—to attempt a synthesis so that these two activities coalesce into one coherent way of life.

The scientific cognition and the religious cognition (in every religious faith there are cognitive elements) are radically different from the methodological point of view. They speak different languages and think with the help of different conceptual tools—so different that they are hardly reducible to each other. If one tries to “synthesize” them too hastily, they usually form a logically explosive mixture. Any authentic and methodologically valuable synthesis must not ignore these differences but rather build on them, and any such synthesis should be done in the personality of the religious scientist rather than in the form of ordering propositions and classifying standpoints concerning religion and science. It is obvious, however, that such a synthesis must be prepared and constantly accompanied by logically organized reflection, thorough analyses, and even systematic studies.

The fact that this synthesis is never accomplished but is always becoming implies that sometimes it is more like a symbiosis than like a synthesis. As in the process of life itself, creative tensions are unavoidable.

The book I am now committing to the reader can be regarded as a collection of “notes” documenting some stages of the road traveled by the author toward this kind of synthesis—a collection of notes rather than systematic reports, because the chapters of this book were written on different occasions as a response to current needs and demands. In spite of this fact, the book forms a consistent whole displaying a sequence of steps that are to be followed if one seriously wants to reach the state of the peaceful coexistence of science and religion.

The book is divided into four parts:

Part One deals with methodological topics. It shows abuses, in this respect, of both science and theology, discusses theological interpretation of scientific theories, and proposes a program for a “theology of science.”

Part Two looks at the science-religion interactions from the historical perspective. Among other topics, the evolution of ideas connected with the “place of man in the Universe” and the evolution of the matter concept are discussed.

Part Three concentrates on the problem of “creation and science.” In this context, the questions of the initial singularity (Big Bang), quantum cosmology, and the role of probability and chance in science are subjected to a thorough analysis.

Part Four looks for vestiges of Transcendence in some key issues of contemporary science and methods it employs in investigating the word.

CREATIVE TENSION

PART ONE

FROM THE METHODOLOGICAL PERSPECTIVE

It is not true that all conflicts between science and religion can be resolved by obeying methodological rules and distinctions, but it is almost true that in all such conflicts some methodological anarchy is always involved. Moreover, both sides of the dispute are guilty of heavy trespasses in this respect. Religious people are often too quick to fill in lacunae in our understanding of the world with the idea of God's finger moving or correcting the world's machinery. This leads to the deplorable "God-of-the-gaps" theology. In the beginning of the modern science epoch, this was considered to be a "natural theology," but even now it operates implicitly in subcontexts of some interpretations of scientific theories. Antireligious people, on the other hand, who do not see such gaps or who believe that sooner or later they will be filled in with sound scientific constructions, claim that the scientific method has eliminated the idea of God from the modern image of the world. In this way, a methodological rule changes into an ontological presupposition and produces "no gaps, no God" antitheology.

These methodological intricacies are best visible in what is the biggest (in the literal sense) challenge to the human quest for understanding—the Universe itself. Is the Universe a contingent instant of existence or a self-explaining entity? Are recent cosmological models and theories able to throw some light on this question? The debate around this issue supplies a handful of examples illustrating the above-mentioned methodological pitfalls. We consider them in Chapter 1.

Facing such a complex situation, we should make an effort to straighten it out. This is the goal of Chapter 2. We try in it to distill from the current practice some indications of what does it mean to interpret cosmological theories theologically or philosophically.

First, we focus on a rather complex notion of physical theory, and then we analyze various ways of their interpretations. Finally, we apply the results of this analysis to the creation interpretations in cosmology. A zealous believer could be disappointed with our conclusions of rather minimalistic character. The point is, however, that we should by no means put God into the loopholes of our theories or, even worse, create such loopholes in order to justify God and God's action in the world.

How should the theologian react with respect to the above analyses? Should he or she abandon any contact with the sciences? Seemingly, this happens very often; in fact, however, it is impossible to do so. The scientific world image (whatever this means) is present in the cultural climate and intellectual atmosphere of any epoch, and no theology can avoid experiencing this climate and breathing this atmosphere. Even if a theology makes an effort to distance itself from the scientific image of the world, it implicitly makes use of at least some of its elements. Inertia of concepts and language involved in these processes could be enormous. If these processes do not remain under control, the image of the world, adopted implicitly, will almost for sure be outdated and no longer scientific. This set of problems is the subject matter of Chapter 3.

To keep under control elements of the world image coming from the sciences and interfering with the theological discourse is a minimum program for any theology aspiring to be of some service for contemporary people. To go beyond it would mean to undertake the effort of an authentic theological reflection on science, its method, and its results; that is, to create what could be termed a *theology of science*. The program for such a discipline is outlined in Chapter 4.

I THE ABUSE OF COSMOLOGY

INTRODUCTION

Cosmology gives us a global perspective of the Universe,¹ or at least what people at a given epoch consider to be a global perspective. The price that cosmology pays for this breadth is that, more than other sciences, it must base its theories on unverified, and perhaps unverifiable, assumptions. This peculiarity opens the door to philosophical and theological abuse.

As a natural science, cosmology is neutral with respect to philosophical or theological doctrines. Unfortunately, this does not prevent scientists, philosophers, and theologians from abusing it. It is usually the so-called God-of-the-gaps theology that snares too hasty a thinker. The trap consists not only in constructing “proofs” of God’s existence from weak points of our knowledge, but also in rejecting God on the grounds that there are no gaps in our science in which God could safely dwell.

Is there some principle, some kind of methodological rigor, that would defend cosmology from dangers of this kind? My proposal is that the intrinsic “problem situation” in science, rather than metaphysical prejudices, should guide responsible research in science, especially in those regions that are remote from experiment.

NEVER SAY NEVER

In the once widely read book *God and the Astronomers*,² Robert Jastrow tells the story of the most remarkable discovery of modern cosmology: The Universe had a beginning. He says that for science alone it is “impossible—not just now, but ever—to find out what force or forces brought the world into being at the moment.” At the end, Jastrow dots his *i*:

1. In this book, we spell the word “Universe” with the capital *U* when it denotes “our Universe” (then it is the same as, e.g., “our Galaxy”); otherwise we use lower case *u* (as when we speak of galaxies in general).

2. R. Jastrow, *God and the Astronomers*, New York: Warner Books, 1980 (first published by Reader’s Library in 1978).