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VOLUME 134

WORLD VIEWS AND SCIENTIFIC DISCIPLINE FORMATION

Science Studies in the German Democratic Republic
Papers from a German-American Summer Institute, 1988

Edited by

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Library of Congress Cataloging-in-Publication Data

World views and scientific discipline formation : science studies in the German Democratic Republic / edited by William R. Woodward and Robert S. Cohen.
p. cm. -- (Boston studies in the philosophy of science ; v. 134)
Includes index.
ISBN 0-7923-1286-4
1. Science--Germany (East)--History. 2. Science--Social aspects--Germany (East)--History. I. Woodward, William Ray, 1944- II. Cohen, Robert S. III. Series.
Q174.B67 vol. 134
[Q127.G35]
001'.01 s--dc20
[509.43] 91-3697

ISBN 0-7923-1286-4

Published by Kluwer Academic Publishers,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

Kluwer Academic Publishers incorporates
the publishing programmes of
D. Reidel, Martinus Nijhoff, Dr W. Junk and MTP Press.

Sold and distributed in the U.S.A. and Canada
by Kluwer Academic Publishers,
101 Philip Drive, Norwell, MA 02061, U.S.A.

In all other countries, sold and distributed
by Kluwer Academic Publishers Group,
P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

The translations from the German in this Volume are by William R. Woodward

printed on acid-free paper

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Printed in the Netherlands

TABLE OF CONTENTS

PREFACE / Robert S. Cohen ix

OPENING ADDRESS / Karl-Friedrich Wessel xi

FOREWORD / Helga Hörz xv

I: INTRODUCTION

WILLIAM R. WOODWARD / World Views and Scientific Discipline Formation: How East German Science Studies Contributed to the Fall of the Cultural Wall 1

MARTIN GUNTAU and HUBERT LAITKO / On the Origin and Nature of Scientific Disciplines 17

II: IDEAS AND INSTITUTIONS

KARL-FRIEDRICH WESSEL / Relating Evolutionary Theory to the Natural Sciences 29

HERBERT HÖRZ / Dialectical Understanding of the Unity of Scientific Knowledge 39

GÜNTER KRÖBER / History of Science in the GDR: Institutions and Programmatic Positions 49

III: MATHEMATICS IN A SOCIO-POLITICAL CONTEXT

HANS WUßING / Historiography of Mathematics: Aims, Methods, Tasks 63

HARTMUT HECHT and DIETER HOFFMANN / The Berlin 'Society for Scientific Philosophy' as Organizational Form of Philosophizing in the Medium of Natural Science 75

REINHARD SIEGMUND-SCHULTZE / Mathematics and Ideology in Fascist Germany 89

IV: PSYCHOLOGY CONSTRUCTS ITS SUBJECT MATTER

ADRIAN BROCK / Imageless Thought or Stimulus Error? The Social Construction of Private Experience 97

LOTHAR SPRUNG / The Berlin Psychological Tradition: Between Experiment and Quasi-Experimental Design, 1850–1990 107
MARY MOSHER FLESHER / Move over Darwin: The Ontogenetic Sources of William Preyer's Developmental Psychology 117
MARTIN MÜLLER / On the Interdisciplinary Genesis of Experimental Methods in Nineteenth-Century German Psychology 129

V: PHYSICS IN THE CONTEXT OF PHILOSOPHY AND THEORY OF SCIENCE

MARTIN KOCH / From Boltzmann to Planck: On Continuity in Scientific Revolutions 141
DIANA BARKAN / Walther Nernst and Quantum Theory 151
ULRICH RÖSEBERG / Historical Explanations in Modern Physics: The Lesson of Modern Quantum Mechanics 163
STEVE J. HEIMS / Fritz London and the Community of Quantum Physicists 177

VI: THEORY AS METHOD

GERALD WICKLEIN / The Middle Ages: Darkness in the Sciences? 191
HANS-PETER KRÜGER / Introduction to the Basic Concepts of Communication-Oriented Science Studies 199
JOHN ERPENBECK / Philosophical Problems of Modern Psychology 209

VII: DISCIPLINE FORMATION OF PHILOSOPHY

HANS-CHRISTOPH RAUH / Neo-Kantianism and Epistemology: On the Formation of a Philosophical Discipline in Nineteenth-Century Germany 223
REINHARDT PESTER / The Transformation of German Philosophy in the Context of Scientific Research in the Nineteenth Century 235
HARTWIG FRANK / Reform Efforts of Logic at Mid-Nineteenth Century in Germany 247

VIII: BIOLOGICAL EVOLUTION IN THE MIRROR OF THEORIES OF EVOLUTION

RALF-DIETMAR HEGEL / August Weismann: One of the First Synthetic Theorists of Evolutionary Biology 259
FREDERICK GREGORY / Darwin and the German Theologians 269
REINHARD MOCEK / Two Faces of Biologism: Some Reflections on a Difficult Period in the History of Biology in Germany 279
PETER BEURTON / What Keeps a Species Together? 293

IX: TEACHERS AND STUDENTS: CHEMISTRY LABORATORIES AND DISSERTATIONS

PAUL R. JONES / The Training in Germany of English-Speaking Chemists in the Nineteenth Century and its Profound Influence in America and Britain 299
MARK R. FINLAY / Science and Practice in German Agriculture: Justus von Liebig, Hermann von Liebig, and the Agricultural Experiment Stations 309
PETER OESPER / Things Are Seldom What They Seem: The Story of Non-Phosphorylating Glycolysis 321

X: NATURAL SCIENCE AND NATURPHILOSOPHIE

ERNST HAMM / Goethe's Morphology of Stones: Between Natural History and Historical Geology 329
ELKE HAHN / The Philosophy of Living Things: Schelling's *Naturphilosophie* as a Transition to the Philosophy of Identity 339
PETER NOLTE / A New Correspondence of the Philosopher F. W. J. Schelling 351
ILSE JAHN / The Influence of Jakob Friedrich Fries on Matthias Schleiden 357

XI: SCIENCE AND SOCIETY

ROBERT BRAIN / The Geographical Vision and the Popular Order of Disciplines, 1848–1870 367
ANDREAS KAHLOW / Knowledge Transfer in the Nineteenth Century: Young, Navier, Roebling, and the Brooklyn Bridge 377
ANNETTE VOGT / Soviet-German Scientific Relations before World War II: Fruitful Cooperation in Different Social Orders 387

XII: THE SOCIAL CONSTRUCTION OF SCIENTIFIC KNOWLEDGE

HELGA SPRUNG / Bourgeois Berlin Salons: Meeting Places for Culture and the Sciences 401
WOLFGANG BEESE / Max Delbrück: A Physicist in Biology 415
FRIEDRICH KLEINHEMPEL / 'Nobody Can Become a Real Engineer Who Has Not Already Become a Whole Person' 423

SUMMER INSTITUTE PROGRAM, 1988 431

ABOUT THE AUTHORS 439

NAME INDEX 451

SUBJECT INDEX 457

PREFACE

The various efforts to develop a Marxist philosophy of science in the one-time 'socialist' countries were casualties of the Cold War. Even those who were in no way Marxists, and those who were undogmatic in their Marxisms, now confront a new world. All the more harsh is it for those who worked within the framework imposed upon professional philosophy by the official ideology. Here in this book, we are concerned with some 31 colleagues from the late German Democratic Republic, representative in their scholarship of the achievements of a curiously creative while dismayingly repressive period.

The literature published in the GDR was blossoming, certainly in the final decade, but it developed within a totalitarian regime where personal careers either advanced or faltered through the private protection or denunciation of mentors. We will never know how many good minds did not enter the field of philosophy in the first place due to their prudent judgments that there was a virtual requirement that the candidate join the Socialist Unity (i.e. Communist) Party. Among those who started careers and were sidetracked, the record is now beginning to be revealed; and for the rest, the price of 'doing philosophy' was mostly silence in the face of harassments the likes of which make academic politics in the West seem child's play.

In view of this devastation, how can we dare to present a serious book containing the work of Marxist philosophers of science, historians of science, and advocates of sciences studies in their sociological, psychological and policy aspects? Are these contributions not the plainly contaminated, ideologically distorted, works of the very establishment types who are being *Abgewickelt*, that is (may we say it) 'deconstructed' in 1991?

We North Americans might say that ours was an ethnographic study. We went to live with our hosts in a different culture, so to speak, for 19 days, during June 17th to July 6th, 1988. Some of us stayed far longer, before and since then. Our hosts treated us to cultural feasts in Erfurt, Leipzig, Jena, Potsdam, Berlin. We made new acquaintance, met new fellow-investigators, and we listened closely to what they had to say. To our surprise, they knew much that we did not ... about Schelling, Boltzmann, Weismann, Haeckel, Fascist mathematics, 19th century

W. R. Woodward and R. S. Cohen (eds.).
World Views and Scientific Discipline Formation, ix–x.
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women's intellectual salons, communication theory, Soviet-German scientific relations, the history of quantum mechanics, and more. They, for their part, listened to our well-documented archival studies and our sometimes penetrating and always individual approaches with equal fascination. They were amused by the humble dress of some of our graduate students, perhaps expecting every Western scholar to be dressed by Madison Avenue. Further, they were often taken aback that our graduate students, not professors, often dominated discussions.

I leave it to our readers to decide whether the 31 East German essays in this book are tainted by prejudice and dogma, or indeed whether they are drastically uninformed. By translating this material from a cross-section of both younger and older scholars, our intent was to demonstrate what we surmised would be a lively field of study on both sides of that rusty Iron Curtain. I thought, too, that the liberalization of scholarship in the GDR was really coming to pass, slowly but markedly, within Marxist language but also through the conceptual languages of other world-views. We could not guess that we were providing the final, lively, platform for an academic culture before its society was overtaken by the West, and with the realistic acquiescence of Moscow.

We suppose that some critics may call us American supporters of a Stalinist state, or at least GDR-friendly innocents, pejorative terms indeed. Yet we invite you to take seriously the evidence gathered here of how some actually went about scholarship within a totalitarian regime. Would we have acted differently? Professor Woodward's Introduction suggests how younger scholars were harassed from within. This the East Germans could understand. What now occurs at the hands of their West German colleagues is more complicated. After losing a decade (or much more for older scholars) in their careers due to deficient education, unaffordable or forbidden professional literature, and political intrigue, most scholars now face total invalidation, and the formal loss of their jobs, through that anonymous way of 'deconstruction' (*Abwicklung*) of entire departments. They may, it is true, compete for their positions again, in the open market; but to an external observer it seems that a harsh and drastic changing of the guard is underway. We have documented what we know about the situation of our colleagues in the section 'About the Authors'.

But now to our book, to be judged for its science, its historical and philosophical scholarship, for the cogency of interpretations. Not for its politics. That is all.

March 1991 ROBERT S. COHEN

KARL-FRIEDRICH WESSEL *

OPENING ADDRESS TO THE FIRST INTERNATIONAL SUMMER INSTITUTE IN THE GDR: PHILOSOPHY AND HISTORY OF THE SCIENCES, June 17, 1988, Berlin **

Ladies and Gentlemen,

You who have come in part from far away countries, mainly from the United States, to take part in the First International Summer Institute for historians and philosophers of mathematics, technology, and science, in the name of the program committee and organizing staff and on behalf of the administration of the Humboldt University of Berlin, I want to extend to you a hearty welcome.

We do hope and trust that you will have a very pleasant stay. We intend to share and discuss our findings. This will be our main task, but we do not want to forget that scholarly exchange of ideas will take place in a German land that is rich in traditions. We are going to show you how in the G.D.R. these traditions are cherished and protected. For that reason, visits to our historical sites are a part of our program. To mention here the most important places, we shall travel not only to Berlin but to Potsdam, Erfurt, Weimar, Eisenach, Gotha, and Leipzig too. We hope that such loci will deepen and stimulate our communication. Historical sites are only significant for us to such a degree as we are able to discover sources of our thinking, of our development, again and again, and to gain stimulation by means of ever new views of our history.

In a very extensive program of scholarship, we shall not only explain the results of research but also introduce you directly and indirectly to methods and methodological principles, drawing comparisons between them. To understand one another means first to know better the differences in operative styles, in cognitive and methodological standpoints. Communication presupposes the clearest possible knowledge of differences that might arise – where these cannot be brought into agreement, mutual understanding and acceptance of the opinion of the other while emphasizing difference is also an important result, perhaps a provisional one from the perspective of a new standpoint that is distinct from both preceding ones.

W. R. Woodward and R. S. Cohen (eds.).
World Views and Scientific Discipline Formation, xi–xiv.
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History in any case is the coagulated action of persons and societies; the factuality of history is uncontested. Not uncontested, however, is how we bring this factuality into experience. One difficulty consists in the fact that, in regard to the object of knowledge – I mean here the factuality of history – it is in the same way as endless as the future. What we select, emphasize, get to know, and revalue or devalue, depends upon the quality of the symmetry of the past and future that we are capable of bringing into our theoretical schemes. Nothing changes thereby in the factuality of history, but our means, our insights, and even our intentions do change, and they do not change at the same time and in the same way.

But precisely this is the reason for our meeting. If we have the opportunity to get nearer to this factual basis through action and to mutually challenge one another in the knowledge of it, we can learn from one another. None of us gathered here, however, will deny it but we all will have to look for a way in which, besides the obvious point of view, we can reach our aim more quickly, being more successful together.

Historians and philosophers of science who lacked knowledge of this history would be without orientation, but they could make quite a decisive contribution to the understanding of the evolution of science, of thought in general, even to the understanding of the evolution of the relationship of humans to nature. Thus they could help to increase our sovereign mastery of our present actions.

Moreover, and this seems to me very important, the complexity of a more and more unified process of the production of knowledge will become evident through the history of science. Scientific knowledge has been produced and developed for the most part first at one place and at a certain moment, yet later it belongs contemporaneously to the whole world. The entire planet has the responsibility for this history; to undertake this responsibility is one of our common objectives. Let us help one another to create as good conditions as possible during and after this Summer Institute.

We have already gained a lot if we organize our meetings – and there will be many of them in the coming weeks – in such a manner that their consequences become irreversible. The integration of our efforts, the efforts of the historians and philosophers of science in the United States, Canada, Great Britain, and the German Democratic Republic, must play an essential part in the strategy of science.

Ladies and gentlemen, allow me please to add one thought. We know all too well that our present times are subject to various dangers and

problems that very often, as is characteristic of our epoch, force themselves into our field of view. Let me describe our present time in the words of the famous Soviet scholar, V. I. Vernadsky in 1942. He wrote:

> We are living in a wonderful geological period in the history of our planet – in the anthropogenic era – as humankind has become in the course of millions of years spontaneously but permanently, and during the last centuries more and more quickly, a geological force that will change the face of our planet. It is up to us to alter the spontaneous process into a conscious one, and the sphere of life – the biosphere – into a realm of common sense – the noosphere (Anonymous, 1988, p. 43).

Yes, this ought to be the basis of a justified epistemological optimism. And precisely because we are living in such a history-laden world we ought to turn against anything that contradicts reason. We do not want to overestimate ourselves, but the question may be allowed whether we do not accomplish something with this Summer Institute together that demands mutual understanding, making us and others aware how wonderful our epoch really can be if peace becomes the description of a condition that no longer contains the possibility of war. If war has no future any more and it becomes the task of historians to describe war to allow future generations to recognize the value of peace, then we shall be able to deal with the "anthropogenic aspect" of our planet more profoundly, more reasonably, and more effectively.

At any rate I do believe that all of us can look optimistically to the future. The latest meeting between Gorbachev and Reagan in Moscow helped to strengthen this optimism. The German Democratic Republic has often expressed its love and its capacity for peace through its representatives. We do hope that we can invigorate this policy of peace by our hospitality.

It is a fine beginning that we have assembled here on the occasion of the opening of the first Summer Institute for historians and philosophers of the natural sciences. We will see in the weeks to come to what extent we succeed together in collecting new experiences. I wish you all, and all of us, joyful days, success in scholarship, various new incentives, even perhaps excitement, a fascinating experience. May these days of our "being together" become lasting, satisfying memories.

NOTES

* Prof. Dr. Karl-Friedrich Wessel directs the *Interdisziplinäres Institut für Wissenschaftsphilosophie und Humanontogenese* at the Humboldt University of

Berlin. This was formerly the *Bereich Philosophische Probleme der Naturwissenschaften* of the *Sektion Philosophie*.

** I would like to especially thank three former graduate students for their extraordinary service in organizing and administrating the summer institute: Dr. Irene Eckardt, Dr. Sigrid Sander, and Heike Schone, soon to be a Dr. We are also indebted to Dr. Fritz Kleinhempel for his extraordinary service in guiding the album with abstracts and pictures (*Gedächtnisband*) to completion during the summer event.

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HELGA HÖRZ *

FOREWORD

Marxist-Leninist philosophy investigates the dialectic of nature, history, and the material and spiritual life of society. Thereby, it emphasizes that the nature of materialistic dialectic consists in the philosophical explanation of objective developmental processes (*Entwicklungsprozesse*). Development is conceived as a tendency toward higher growth that asserts itself via stagnations and regressions as well as the formation of all the elements of a phase of development. The object of the materialist dialectic as science (*Wissenschaft*) is *objective dialectic*, i.e., the structure, change, and development in nature and society, *subjective dialectic*, i.e., structure, change, and development of concepts and theories, and the *dialectic of the process of cognition* (*Erkenntnisprozess*), i.e., the structure, change, and development of the system of ways of cognition.

The sciences convey insights into these objects. Marxist-Leninist philosophy must support itself therefore upon the knowledge of all the scientific disciplines so as to become methodologically effective as a way of thinking and as a theory of method and a critique of method. Especially the natural sciences have provided extensive material to make philosophical statements precise, e.g., investigations of the relation of the biotic and the social, new aspects of the person-environment relation with the ecology discussion, research on the laws of mental processes, and much else. The essential thing in all this is new tendencies of scientific development that demand intensified dialectical thought in new dimensions. To them belong global problems of human development, growing complexity of scientific tasks and societal relevance, and the origin of new theories and methods.

Global problems of human development extend from the most elementary interests of humans to live and nourish themselves, through the maintenance of the natural conditions of human existence, on up to the conquest of the cosmos. Natural scientific research is closely connected with global problems. It is therefore important to philosophically analyze the natural conditions that affect human existence and the development of humans themselves. Materialistic dialectic must prove itself ever anew as world view, epistemological, and methodological

W. R. Woodward and R. S. Cohen (eds.).
World Views and Scientific Discipline Formation, xv–xvi.
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foundation of all natural scientific research work. Dialectic can therefore never be conceived as a mere schema. Already Karl Marx emphasized that it

> includes in its comprehension an affirmative recognition of the existing state of things, at the same time also, the recognition of the negation of that state, of its inevitable breaking up; because it regards every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence; because it lets nothing impose upon it, and is in its essence critical and revolutionary (Marx, 1962, 1859; from the Afterword to the second German edition, 1873).

The Department of Philosophy of the Humboldt University of Berlin sets for itself the task of further working out the materialistic dialectic in a productive manner. With the following contributions by scholars of the Department and their guests, a feast for discussion is spread out. The points of departure are various, but they serve a single goal: to bring newly-won ideas into the contest of opinion among philosophers and between philosophers and natural scientists.

NOTE

* Professor Dr. Helga E. Hörz was director of the Institut für marxistisch-leninistische Philosophie at the Humboldt-Universität Berlin until 1990.

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WILLIAM R. WOODWARD *

WORLD VIEWS AND SCIENTIFIC DISCIPLINE FORMATION: HOW EAST GERMAN SCIENCE STUDIES CONTRIBUTED TO THE FALL OF THE CULTURAL WALL

The history of scientific discipline formation in Germany played a special role in the fall of the wall, intellectually and institutionally. It emanated from philosophy departments in social science faculties in the German Democratic Republic, a relatively small "niche" as they say there, where one could do work around the edges of those fields of Marxist-Leninist scholarship that mattered most to the power elite. From this niche proliferated students and students of students, fanning out from Berlin in the 1960s to Greifswald, Rostock, Jena, Erfurt, Leipzig, and elsewhere. A separate line of science studies descended in the Academy of Sciences from the unit for Science, Theory and Organization, and it too emerged on the edges of the economic, political, and philosophical power structures. The section headings here are meant to suggest that "science studies" (*Wissenschaftsforschung*) in this socialist regime had investigated similar categories of discipline formation as in our Western regimes: institutions, theory of science, theories of method, epistemology, evolution, laboratories, *Naturphilosophie*, society, and social construction. Our thesis is that science studies in socialist and capitalist culture were less far apart than many thought.[1]

Since the time that these chapters were presented in 1988 and subsequently rewritten, changes have taken place both institutionally and intellectually that make them the last work of its kind in the East German socialist tradition. Little did we know that this cooperative effort between North American and German Democratic Republic historians and philosophers of science would foreshadow the unification that followed. The assimilation process is by now well underway in the two Germanies, though the price is heavy: the dismissal of about 50% of East German academicians and up to 70% of the members of the Academy of Sciences. This volume records a cultural tradition that may soon disappear. As the authors' notes reveal, many of the younger colleagues have lost their positions, and other senior persons are likely to follow. Science studies in the GDR is being "deconstructed" (*abgewickelt*) to make way for philosophers, historians, and scientists trained in other traditions.

W. R. Woodward and R. S. Cohen (eds.).
World Views and Scientific Discipline Formation, 1–15.
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THE WORLD VIEW OF DIALECTICAL MATERIALISM

In 1954 the death of Stalin opened the way to science studies in the Soviet sphere. In the German Democratic Republic in 1958, Hermann Ley established the subsection of philosophy "Philosophical Questions of Natural Science" at the Humboldt University of Berlin. In 1975, Karl Friedrich Wessel succeeded him. Over 250 dissertations issued from this Department during their successive tenures. Students and colleagues of Ley established similar chairs at the Academy of Sciences for the study of science in society (Kröber chapter) and at other universities. Ley's multi-volume *History of the Enlightenment and Atheism* began to appear in 1966; he wrote that "the objective of the work before us is the origin of elements of the scientific world view, not the genesis of the religious" (p. 3). Of particular interest to us in the pluralistic West is Ley's claim that "ancient, bourgeois, and proletarian atheism are progressive moments in the origin of the scientific world view (p. 9)." Atheism was evidently an article of faith shared by many intellectuals during the forty-five year reign of Marxism-Leninism in the GDR. So too was materialism.

Herbert Hörz set the tone for Marxist-Leninism with his first major publication, *Der dialektische Determinismus in Natur und Gesellschaft* (1962). It served to link natural science with dialectics on a factual basis and had a positive reception because there was nothing comparable. His later books were broadened extensions of this one (1974). Hörz believed that dialectics is that of a non-evolving world governed by what he calls "dialectical determinism", with the dialectics of evolution or development superimposed as an additional case. His first major book thus foreshadowed the future of the GDR. It was a theory of non-evolution. According to his critics, it had no capacity for growth, e.g., "the deficiency of the Marxism promoted among us to date in relation to the 'women's question' is only one aspect" (Dölling, 1990, p. 675).

By comparison, others, following Marx, took the dialectics of evolution to be the basis of all dialectics, with the world of non-evolution as a special foreshortened case. Peter Ruben's essays appeared under the title "dialectics of labor" (1975) in West Germany. Colleagues there saw to it that this stream in Marxism came to public attention. Ruben adhered closer to Hegel's and Marx's original intent, a world of evolution in which "motion" in nature led to "productive activity" in animals, and this led to "labor" in humans (Beurton, 1990). This line (cf. Hedtke, 1990) was labeled "revisionist" and the Solidarity revolt in August 1980 in

Poland was the occasion to "censure just as strictly the members of the Institute [for Philosophy of the Academy of Sciences] who had spoken out for Ruben. This affected Dr. sc. Peter Beurton, Dr. Bruno Hartmann, Dr. Ulrich Hedtke, Dipl. phil. Lothar Pawliczak, Dr. Dieter Püschel, Dr. sc. Werner Röhr, Dipl. phil. W. Templin and Dr. sc. Camilla Warnke (reassignment, heavy limitation of possible scholarly work, up to firing without notice). These clashes were linked with political and academic relations and coordinated by the Institute leadership [*Institutsleitung*: the Director was Manfred Buhr], the then Party Secretary, the prevailing Party organs, and the board for philosophical research" (Klenner, 1990). So wrote the Chairman of the Scientific Council of the Philosophical Institute of the Academy of Sciences. Dominating this forty-year era was thus the fear of legal recrimination, as these two new directors also testified (Ruben & Kuchling, 1990):

> The Central Institute of the Academy and the Philosophy Department ... intend to contribute to analysis and knowledge of the history of GDR philosophy by presenting in public and discussing serious events and personal fates in this history. To these events belongs the arrest of three students of the Humboldt University and their sentencing to many years of prison. The case occurred in 1958 .... The political transformation since October 1989 makes it possible and compellingly necessary to analyze and judge this event as a component of the real history of philosophy in the GDR. A complete working up of the history of philosophy of the GDR is not exhausted in new retrospective reflections but requires exposing the influence of political relations and intentions on the conditions, forms, and results of philosophical activity – not least on the personal fates of students, workers, and university teachers, who as a result of free expression of opinion, political involvement, or other circumstances, had to expect in part very grave negative consequences (p. 1008).

With this background in mind, let us examine a collective work commemorating the tenth anniversary of the founding of Ley's subsection, *World View and Method* (Griese & Laitko, 1969). The editors inform us that colleagues formed a working committee to bring "democratic" and "anti-Fascist" ideological education to the schools, called "world view-philosophical education in natural science instruction" (p. 4). Ironically, it was Herbert Hörz (1969) who explained in this volume that dialectical materialism before Marx treated nature as matter, but without dialectics it could not account for how, from productive forces, nature gave rise to social and economic structures. Since scientific work is one productive force, science would henceforth be regarded – following Lenin – as a "reflection of the economic basis of the society" (p. 32).

Among the other spokespersons for the reinterpretation of Marx was

the aforementioned Peter Ruben, also a Ley student, who related "natural dialectics" to a critique of the so-called "Neo-Left-Hegelians" – Alfred Schmidt, Franz Borkenau, Jürgen Habermas, and Theodor W. Adorno (Ruben, 1969, p. 64). He reproached Habermas (1963) for claiming that nature and history are separate, and hence for denying the "dialectic of nature" (p. 54). Western Marxists had argued on the basis of the early Marx that nature has a history only in reference to humans. Marxist-Leninists made it an article of faith that nature, as matter, has a history, and that quantum theory and the theory of relativity support this natural dialectic. Thus the concept of work entails a unity of man and nature.

Alfred Schmidt (1965) maintained in West Germany that in human work, we use up the material object and produce a use-value *(Gebrauchswert)* (p. 153). Schmidt considered work from the standpoint of the value-using citizen (*Bürger*), wrote Ruben, while he, Ruben, viewed it (with Marx) from the standpoint of the worker. He argued that the former entailed capitalist structures, the latter required socialist ones. The former was called negative dialectics (Adorno, 1966), the latter natural dialectics. Evidently Ruben had overstepped the bounds of grace in the party line. Circa 1980, he was labeled "revisionist" and ruled out of the Communist Party. Only in 1990 was he "rehabilitated," becoming director of the Philosophy Department affiliated with the newly constituted Learned Society of the Academy of Sciences, responsible for reducing his staff by 70%.

Thus East and West German interpretations of "world view" *(Weltanschauung)* since the 1960s entailed different Marx interpretations as they came to terms with the relationship between the natural and social sciences. In West Germany, various critiques of ideology appeared, generally at odds with or utterly ignoring East German Marxists. The Frankfurt School, for example, has as its main feature that only social history is dialectical (cf. Marcuse, 1968 [1932]). In East Germany, the official program of sociopolitical, if not economic determinism endorsed "dialectical materialism" and criticized "bourgeois capitalism." On the face of it, natural and social dialectics were one continuum.

The example above was Hörz, praising working class East and criticizing bourgeois West to placate party philosophers (cf. Hörz & Wessel, 1986, p. 270). However, the real theoretical issue between Hörz and Wessel and their critics was this: they believed that social laws are somehow an extension of mechanical and biological ones. No discussion of empirical social science and dialectics need occur because Marx had

done all the work. But in the study of the natural sciences, things were different. Many scientists and philosophers were trying to establish links. They acknowledged that the method of dialectics was definitely distinct from the methods in the single scientific disciplines. They further maintained that this distinction is vital for fruitful cooperation between philosophy and the sciences. Those who believed in a continuum between natural and social scientific laws saw no need for a discussion of "world view"; they had the only one possible. It was the scientists, however, who questioned the nature of the linkage between "world view" *(Weltanschauung)* in society and "world picture" (*Weltbild*) in science. Hörz & Wessel (1986) popularized this issue, but the intellectual work behind it occupied many members of the scientific community. They were struggling for a socio-economic understanding adequate to the factual basis of the modern sciences. They considered the prevailing Marxist-Leninism much too crude.

North American scholars took a back seat in these developments, beginning to translate Frankfurt School works only in the 1970s and not paying attention to East German scholarship at all (cf. Woodward, 1985). A trickle of social science and literary feminism issued from *Studies in GDR Culture and Society*, a product of an annual weeklong seminar of the World Fellowship Conference in Conway, New Hampshire, during 1974 through 1991. Other institutions recognizing GDR culture are the *Deutschland Archiv*, edited from Cologne, the *IGW-Report über Wissenschaft und Technologie in der DDR und anderen RGW-Ländern* from the *Institut für Wissenschaft und Gesellschaft* in Erlangen, and *Forum Wissenschaft* from the *Bund demokratischer Wissenschaftlerinnen und Wissenschaftler* in Marburg. Their institutional and intellectual assessments contributed to the evaluation of GDR scholars and institutes by the Scientific Council in Bonn in 1991.

EAST EUROPEAN EFFORTS TO ANALYZE SCIENTIFIC DISCIPLINE FORMATION

Far less well known in the West are *East European efforts to analyze scientific discipline formation* during the past decade, inspired by Soviet scholarship. The level of analysis of discipline formation has grown out of work on scientific schools (Mikulinskii, 1977, 1979). Schools typically exemplified local styles, but the East German assumption (apparently in favor) was that they cooperated nationally and internationally with other

schools to make up disciplines. The international component is particularly interesting, as a herald of the dissolution of the cultural wall. Some examples of the international treatment of scientific schools include psychology (Yaroschevskii, 1982), German geology (Guntau, 1984), and former East German interdisciplinary fields with a problem orientation (Parthey & Schreiber, 1983). These studies of discipline formation comprise the main source of the idea for this volume.

The historical events of the opening up of the socialist countries in the Fall of 1989 has its parallel in this book. This volume was envisioned as an introduction to important ongoing work in the German Democratic Republic. It became, as events unfolded, a kind of final statement before collapse of the regime and its rapid political unification, annexation, or colonialization by the West, as the case may be. The term "world view" (Griese & Laitko, 1969; Hörz & Wessel, 1986; Kröber & Krüger, 1987) becomes particularly transparent in this superposition of the West on the East; for those of us who see merit in accepting the categories of a culture as they were, the texts here enable a glimpse into the fine texture of socialist science studies. The term "discipline formation" (Guntau & Laitko, 1987, pp. 49–50) refers to "a definite historical process" of "object-related communication nets to guide the cognitive sets of its participants." Since the "All Union Conference on Philosophical Problems of the Natural Sciences" in Moscow in 1970 (Wollgast & Teinz, 1973), translations of Soviet work (Autorenkollectiv, 1985), and the subsequent era of Erich Honecker, a "cautious cultural opening *vis-à-vis* the West" has occurred (Kapferer, 1990, p. 326). Numerous volumes on science studies were just tips of the iceberg that was slowly thawing over the past two decades. Their purpose was conciliatory in a Cold War context: to acknowledge Soviet organization of science, while edging a conservative GDR regime back into the West European and North American technological mainstream.

IDEOLOGY AND CULTURE-POLITICAL CONTEXTS OF SCIENCE

Herbert Hörz was the dominant representative of the GDR style of studying philosophical problems of science and technology before the collapse (*die Wende*) in the Fall 1989. A year after the peaceful revolution Hörz (1991) retrospectively contended that he himself was suppressed by the forces that were. How will the former East Germans sort this out in the future? For example, in a recent exposé of GDR philosophy (1991, p. 58), Ruben maintains that evaluation of responsibility for the past ought to refer to the individual person's activities rather than passing verdicts on groups or institutions. Renate Wahsner sets the record straight with a criticism of Hörz's retrospective claims (1991). Hans-Peter Krüger also names names, in particular that of the former director the Central Institute of the Philosophy at the Academy of Sciences, Manfred Buhr (1991c; in press). In another case, three students at the Institute for Philosophy of the Humboldt University, Peter Lange from East Berlin and Heinz-Dieter Schweikert and Karl-Heinz Messelken who had resettled there from West Berlin, expressed support for state socialism but disappointment about the methods of the Party. At a hearing on March 7, 1958, only two hands went up in their support and several abstained; they were delivered to the Stasi and subsequently received a five and half years prison sentence for "endangering the State" (Burchard, 1990). One who raised his hand "was tormented every other day to distance himself from the state criminal Peter Langer … by people who sit here, but I will not say the names."

WORLD VIEW AND DISCIPLINES IN WESTERN EUROPE AND NORTH AMERICA

West German and North American historians and sociologists have come at the problem of world view from a different quarter – to expose the "ideology" and culture-political contexts of science. Karl Mannheim (1936 [1929]) introduced ideology as a category to understand the sociology of knowledge; Fritz Ringer revealed the ideology of the academic elite and how it justified an illiberal state in return for privileges (1969). More recently, others have detailed the contribution of ideology and world view to education (Jarausch, 1982), institutions of higher education (Turner, 1971), popular literature and sociology (Lepenies, 1976), science lobbies (Weingart, 1970), and scientific establishments (Elias *et al.*, 1982). Why not turn this intellectual arsenal to a contemporary problem: the dissolution of "science studies" in the GDR during 1991?

Ideology is less salient a characteristic than simply the different sources available in the chapters presented here. The literatures have indeed diverged and remained largely isolated for nearly half a century. Language and education have taken scholarship in independent, but partly parallel, traditions; the sections of this book are testimony to this remark in that they are covered jointly by authors from the different traditions

united by substantive concerns. Since the majority of North Americans represented here are historians of science, while the majority of Germans are philosophers of science, we should guard against facile contrasts on this dimension.

A recent volume on "Science in Germany: The Intersection of Institutional and Intellectual Issues" considers the relations of German scientific thought and practice to educational reform, creativity, and institutions (Olesko, 1989). From our perspective, however, these leading North American historians of German science and education treat aspects of disciplines-in-the-making: e.g., philosophy as pure versus applied, medicine as science, general science, organic chemistry, electrical technology, pure and applied mathematics, and eugenics. A discipline is, after all, more than a reservoir of knowledge. The more interesting issues of discipline formation are not purely intellectual ones. And institutions, while crucial, do not exhaust the topic of disciplines. The discipline is evidently a level of analysis lying somewhere between ideas and institutions, intersecting with such topics as "academic entrepreneurship," "personal promotion," and "the professionalization of research activity" (Turner, 1989).

The term "discipline" has only gradually come to provide an appropriate unit of historical and philosophical analysis. Magali Safarti Larsen (1977) proposed the "market model" of discipline formation whereby competitive forces lead to scientific creativity through expansion of teaching and research positions. Danziger (1990) extended this model to the need of educational administrators for ways to measure and sort students using the investigative practices of psychology. Here is a fruitful example of the integration of cognitive and social factors. A more theoretical model comes from a prominent German sociologist. Niklas Luhmann offered a sociology of knowledge model (1980) drawn in part from Talcott Parsons. Luhmann proposes a shift from stratification to functional differentiation employing an evolutionary model of selection processes. It led to a valuable focus on the emergence of semantic and social structures in the disciplines of physics (Stichweh, 1984) and philosophy (Köhnke, 1986) in nineteenth-century Germany. Programmatic pieces (Lemaine *et al.*, 1976) and well-documented archival studies of a discipline between other disciplines (Kohler, 1984) complete our stock-taking.

Mitchell Ash and I have elsewhere argued that the field of psychology established itself as an academic discipline in the course of the nineteenth

century, and that it became professionalized in the twentieth century 1982, 1987). Here I suggest a roughly similar sequence for the other disciplines. The authors explore nineteenth-century discipline-specific factors (in mathematics, psychology, physics) as well as extra-disciplinary ones (salons, bridge-building, biologism as ideology), showing the fluid nature of nineteenth-century disciplines. They also explore some twentieth-century professional issues (mathematics and ideology, communication-oriented studies, scientific communities). Together they reflect a sophistication beyond the older notions of discipline formation that assumed linear accumulation of knowledge. They push the understanding of disciplines beyond the market model and the reproduction theory mentioned above. We hope here to deepen and broaden these traditional models of North American and East European science studies into a richer model for the 1990s.

GLOBAL INTERDEPENDENCE OF EMERGING SCIENTIFIC DISCIPLINES

Granted, then, modern disciplines have been in flux and their areas overlapping, especially on the public side, since at least the nineteenth century. Yet the nineteenth century was also the time when disciplines became identified as such. Disciplines entail research activity and pedagogy in various institutional settings (Coleman & Holmes, 1988, p. 2). The other side of the investigative enterprise is the *teaching function* of the research team, both in conveying general knowledge to entering students and in apprenticing older students in the tacit knowledge of investigation and the working techniques of scientific discovery (Yaroschevskii, 1982; Olesko, 1988). The so-called "pedagogical model" took on various guises, depending on the personalities and institutional contexts of its participants (e.g., Coleman, 1988).

As the practitioner of science becomes a topic of historical attention, we learn of the local knowledge in discipline formation: the scientific schools at Petersburg, Leipzig, Munich, Heidelberg, Berlin, Vienna, and so on remind us that *regional and national differences* are vital components of emerging disciplines. The Russian "research collective" at public institutions (Yaroschevskii, 1982), for example, may well differ from the American medical school at private universities, as the latter differ between one another.

Among other potent features of the North American situation was the necessity to compete for funding. Between and even within disciplines,

the going was rough in terms of the *competitive allocation of resources*. To take one example, "general physiology" struggled with zoology, cell biology, embryology, neurophysiology, and many other specialties for an institutional place in medical schools and universities until well into the twentieth century; "in those decades the most notable phenomenon was lack of discipline" (Pauly, 1987).

The times are now ripe for a convergence of approaches from East and West. World views may well remain intact for some time, underpinned as they are by political values. If the polemics about world cooperation in the face of mutual threats to survival have any force, it is incumbent upon students of science and society to take these "world view" lenses into account in their reportage on science. What we see here is that problems of common concern are illuminated and brought into focus – rather than obfuscated – by acknowledging the complementary world views of East and West.

We hope that this volume may serve to introduce a new era in which we consider more fully the cultural contexts of disciplines. Cultural relativity is a *desideratum* of science studies. We should not be taken in by the form of GDR science studies, the occasional incantations against "bourgeois philosophy" (cf. Kapferer, 1990), but rather try to appreciate the efforts of those scholars caught within a dangerous nexus of totalitarian instruments of power. Virtually all were members of the Socialist Unity Party and communists of some stripe. The real issues transpired at the level of individual efforts to reform a resistant social science ideology – initially in the natural sciences and recently in the communication sciences. Widely acknowledged as one of the most original is Hans-Peter Krüger (see his chapter below), who attracted attention with a critique of Stephen Toulmin and Jürgen Habermas (1990a). He has since drawn on the post-modern French work of Lyotard and Maturana (1990b) and stressed the need for "radical democratization (1991a) and communicative action in society as a whole (1991b).

GDR culture critic Jürgen Kuczynski (1987) described the tradition of the intelligentsia in Germany, drawing quantitative comparisons. German historian of philosophy Hans-Martin Sass (1978) noted that in the GDR "the role of philosophy as a state philosophy is incomparably different and the possibilities of a philosopher having an influence incomparably more varied" (p. 36). The assumption that all authors toed the party line is surely as misplaced, however, as the opposite accusation that Western authors were "bourgeois". While the present absorption of East into West

could yet yield a new hybrid intellectual life, the material conditions and "market mechanisms" may favor a replacement of East with West personnel (cf. *Bund*, 1990). German proposals for a "fusion" of science studies are under discussion (Burrichter, 1984, Förtsch, 1990). The intellectual products of the East German intelligentsia are rapidly disappearing from the bookstores, in any case, and the intellectual synthesis hardly looks reciprocal so far (Kuczynski, 1990). It will take an unimaginable tolerance and sympathy from colleagues in the West, and an equally unimaginable effort at reschooling by colleagues in the East, for such an equal merger to come to pass.

NOTES

* Department of Psychology, Conant Hall, University of New Hampshire, Durham, New Hampshire 03824 USA. I am grateful to the National Library of Medicine of the National Institute of Health for the grant (LM 03496) that enabled me to attend the International Congress of Psychology in Leipzig in July 1980 and the Preyer Symposium in Jena in 1982. The Alexander von Humboldt Stiftung supported 18 months in 1981–1982, and the National Endowment for the Humanities supported a research year in 1985–1986, both in Heidelberg. The final month's stay in Berlin in July 1986 led to the current project. Subsequently, IREX (the International Research and Exchanges Board) funded travel to plan and conduct this summer institute in 1987 and 1988. The Council for International Exchange of Scholars in conjunction with the *Ministerium für Fach- und Hochschulbildung* (E. Berlin) and the *Fulbright-Kommission* (Bonn) supported a further ten months as guest professor at the Humboldt University of Berlin during September 1990 through June 1991. Throughout this decade my family and I received generous help from GDR colleagues.

[1] The recent book by Norbert Kapferer on "The Enemy Image of Marxist-Leninist Philosophy in the GDR, 1945–1988" (1990) treats one branch of official philosophy and literary criticism, which indeed prevailed from the 1950s through the 1970s. We have emphasized the more recent philosophy and history of science, conducted by senior colleagues since 1970 in the *Deutsche Zeitschrift für Philosophie* and in elite publishing houses, as well as junior colleagues in dissertations and institute or university publications (Berlin, Greifswald, Rostock, Halle, Jena, Dresden). Our coverage is complementary, chronologically and topically. Kapferer focusses chiefly on the pre–1980 "enemy images" directed toward "Romanticism, philosophy of life, and existentialism" of Dilthey, Nietzsche, Heidegger, and Freud (e.g., by Georg Lukacs, Ernst Bloch, and Wolfgang Harich). We show, e.g., the post–1980 "friendly" treatments of subjects like Schelling, Darwin, Haeckel, and the NeoKantians (led by Gerd Irrlitz, Ilse Jahn, Reinhard Mocek, and Hans Christoph Rauh).

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Volume 134

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Edited by

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Treviranus, G. R. 260
Tschermak, G. 264
Twesten, A. 248–249, 254

Ueberweg, F. 254

Valentin, G. 137
Varnhagen von Ense, K. A. 409
Veit, D. 405
Verworn, M. 281, 283
Vierordt, K. 132–133, 136, 138
Virchow, R. 242
Vogt, O. 76, 81, 85-86
Voigt, J. C. W. 331
Vorländer, K. 226–227
Vygotsky, L. S. 202, 205, 210

Wagner, R. 242
Warburg, O. 323
Watson, J. D. 419–420
Watson, J. B. 97, 103
Weber, E. H. 131–132, 136, 138
Weber, M. 226
Weber, M. M. von 423–428
Weber, W. E. 358
Weierstrass, K. 92, 392
Weiner, C. 177
Weisse, C. H. 227, 243, 252
Weissmann, A. 261–265
Westermann, G. 367–375
Westphal, W. 391
Whitehead, A. N. 226
Wien, W. 146, 148
Wiesel, P. 408
Werner, A. 155
Wertheimer, M. 107
Weyl, H. 184
Windelband, W. 213, 224–225
Wittgenstein, L. 98, 102
Wöhler, F. 299, 302, 306
Wolff, C. 238
Wundt, W. 19, 100, 104, 107, 133, 226

Yaroschevskii, M. (J.) 210, 214
Young, T. 379–381

Zedlitz, K. A. von 405
Zeigarnik, B. 109
Zeller, E. 107, 228, 255–256
Zilsel, P. 187
Zöckler, O. 269–271, 274–276

SUBJECT INDEX

Absolute 180, 346–348
Academy of Science 2–3, 52, 55, 65
  of the USSR 390–392
Action 200, 220–221
Activity 344–345
  activity theory 204
Anthropology 227, 236, 362–363
Anti-Semitism 90
Antimodern 94

Behaviorist 98, 117
Behaviorism 102–104
Bible 193–194
Biopsychosocial unity 33

Categorical net 19–20
Categories 31, 214, 243, 255
Chance 32, 45, 209, 272, 336
Chaos 174
Chemistry 185, 299f, 309f, 321f
Christian 191–196, 276, 363
Cognition 205, 215–218, 230, 249, 370
  cognitive activity xi, 18, 94
Collapse (*die Wende*) 6
Cold War 6
Communication xi, 22, 90, 94,
    199–206, 213–214, 403
  centers 401, 410
social 203–206
Communism, Communists
  German 60
  Party ix, 187
Community
  scientific 5, 9, 307
  philosophical 85
  of introspectors 102
  of physicists 177, 183, 188
Consciousness 40
  progressive historical 59
  practical reality of c. 205
  how does c. develop 341, 346
Conservative 94
Cooperation
  between scientists 203
  direct and indirect (Marx) 203–204
  learning and playing (Elkonin) 203
Culture (cultural) 181, 202, 281–283
  c. sciences 224
  cultivated sociability 401–402
  salon (see salons) 409–411
  self-cultivation (*Bildung*) 368

Darwinism 283–284, 287, 294
Deconstruction (*Abwicklung*) ix-x, 1
Determinism 174, 209
  uncertainty relation (indeterminacy
    relation) 168, 171
  dialectical 213, 424
  Laplacean 174
  of natural science 191
  in history 165
  postpartum 117
Dialectic, dialectics 4, 40–47
  Hegelian 227
  materialist, materialism xv, 2–4, 33,
    39–40, 42, 46, 209
  negative 4
  principle of negation 165
  subject-object xv, 212–213
  tradition 229–230
Dialectical
  contradiction 165, 167–168
  materialist 209
Discipline (see interdisciplinary)
  community 19, 85
  differentiation of 43, 107
  formation 5, 6, 8–9, 17, 23–26, 114,

W. R. Woodward and R. S. Cohen (eds.).
World Views and Scientific Discipline Formation, 457–462.

151, 243, 247, 256, 415- 418
geographical 372
logic as d. 254, 256
measurement of 22
physical chemistry as 151
scientific 17–18, 43, 64
as teaching profession 21
Discourse (see language) 20, 151, 160
discursive practice 201, 203–205

Education 7–9
in chemistry 299–307, 311
Emancipation
of women 401–402
Empirical philosophy 79
Empiricism, empiricist, empirism 80, 101, 342, 355
Encyclopedia 70, 237–238
Energy 46
Enlightenment 191, 235
Epistemology 76, 81, 83–84, 99, 149, 178–181, 205, 210, 216, 223–231, 341–342, 370, 417
epistemological elitism 348–349
genetic 231
Marxist-Leninist 230
new discipline 228
Equal rights 407
Euthanasia 93
Evolution, theory of 2, 30, 35, 46, 217, 261–265, 281–284, 294
evolutionary synthesis 293
non-evolution 2
Evolution, history of 341
Evolutionary epistemology 34, 108, 226–227, 231
Experience 102, 341
Experiment 99, 102, 107–111, 147, 151f, 173, 354, 382
experiment stations 309–317
Explanation 114
models of 163, 169

Fascism 72, 84–85, 89–94, 224, 280, 284–288, 395–397
Formalization 249
Frankfurt School 4, 226
Freedom 222, 348
Funding 9

German Democratic Republic (GDR) 1–7, 49–51, 54–55, 57–60, 65
German Mathematicians' Association 90, 93, 392
German Natural Scientists and Physicians (*Deutsche Naturforscher und Mediziner*) 158
Gestalt 40, 76, 102, 109
Global problems 41
God (see absolute) 192, 269, 273, 380

Hermeneutic method 108, 201
Historicism 164
Historicity 164–165
History
of geology 335
of mathematics 63–73
of medicine 49–50
of philosophy 3, 223f, 235f, 247f, 339f, 351f, 357f
of psychology 97f, 107f, 117f, 126f, 210
of physics 141f, 151f, 163f, 167, 174, 177f
of science 49, 51–61, 165, 229
Humanism (antihumanism) 35, 281–282, 289
Human sciences (cultural sciences) 224, 236, 261
Hypothesis 157
wave 381

Ideology ix, 6–7, 20, 41,45, 59, 89–94, 231, 279, 282, 285–286
Imageless thought 98–99, 103
Indeterminism (see determinism)
Information technology 46
Inheritance 125–126, 263, 417
Institution 304–306, 317
Institutional 5, 8, 20–21, 23, 25, 51, 85
Institutionalization 20–21, 55, 114
Interdisciplinary (multidisciplinary) 9, 22, 43, 199–200
relation of philosophy and individual disciplines 33, 242
interdisciplinarity 43, 45, 76
Intersubjectivity 420
Introspection 97–98, 102, 212
Intuition 345–348
Invariant, invariants 17, 215–218
Invisible college 22
Ideology ix, 6, 7, 20, 41, 59, 89–94, 231
Interiorization 200, 212, 218–219

Jewish 90–91, 179, 187, 404, 407
Jews 92, 179, 283, 404

Knowledge 12, 17, 22, 24, 40, 42, 80, 98–99, 182, 195–196, 228–230, 340
tacit 384

Language
function of 203, 205–206
invariants named by 218–219
in physics 149
logical 253
ontogenetic study of 121–125
private language argument 98
public 102
Law, laws 4–5, 24, 32
of displacement 142
divine 195
functional dependencies 192
of geological form 330–332
Hardy-Weinberg l. 296
of nature 381
Newton's 143
of mechanics 141
natural law in biology 284
Ohm's law
of physics 181
Simon's 157
of thermodynamcis 141, 145, 157
of specific energies 122
Stefan-Boltzmann 142
Logic
Aristotelian 255
deductive 182, 254
reform efforts of 247–256
empirical and philosophical 250

Magic 196
Marxist ix, x, 4, 18, 31, 58, 69, 71, 205, 210, 229–230, 426
Marxist-Leninist xv, 1–2, 4–5, 35, 230, 424–425
Materialism 271
emergentist 211
historical 33
mechanical 174, 424
m. in science studies 202
philosophical 228, 339
Mathematical
formalism 168–169
Mathematics 43, 63, 65, 73, 75
Measurement
quantum theory of 183
m. parts 192
Mechanics
classical 169, 174
matrix 167–168
technical 377
wave 168
Mental states 98–100
Methodology
psychological 108–111
Method, methods
of Boltzmann 146–148
dialectical 243, 251
history of psychological methods 129–136
hypothetico-deductive 265
inductive 359
interview 100
learning and memory methods (in psychology) 134–135
model building by analogy (in physics) 159
naturalist observation 124
psychophysical 131–133, 137
quasi-experimental 109–111
statistical (in physics) 148

systematic experimental introspection 100
reaction time methods 133–134
Migration 186
Mind 98, 342, 347–348
access of human m. 381
Model
Bohr's model of atom 167
of negative free electrons 155
building by analogy 159
modeling 215–216
system of 421
Monism 288
Monist League 77, 288

National Socialism (Nazism) (see Fascism) 89–90, 92, 179, 186, 279, 282
Nature 341–345, 348, 355
Natural history 229–330
Natural philosophy 377, 379
Naturphilosophie, naturphilosophische 1, 239, 259–263, 339–345, 354
Neo-Darwinism 264
Neopositivism (see positivism) 229
Norms 21–22
Notgemeinschaft der deutschen Wissenschaft (Emergency Association of German Science) 186, 395

Objectification 212, 253, 348
Objective
development 144, 341
reality 212, 216
o. significance of logical forms 254
o. being in nature 344–346
Objectivity
philosophical 252
scientific 183
Ontogeny 117–118
Ontology, ontological 229
o. assumptions 217
Origin myths 103

Paradigm 144
Peace xiii, 60–61, 280, 284, 402
Pedagogy 91, 371, 424–425
Personality 44, 204–205, 214, 314, 329, 336, 363, 415, 426, 428
Phenomenologists 183
Phenomenology 182
Philosophy xv, 8, 11, 31–35, 43
bourgeois 242
Marxist 210
of life 360
speculative 252
transcendental 252
Philosophical theory 31–35,
Physics 74, 169
classical 141, 144, 174
quantum 141–149, 163–174
Platonism 192
Political 94, 186
Positivism (see neopositivism) 77–80, 210, 270
Practice 72
Pragmatic 237
Presuppositions 40
Principles (*Gesetzmässigkeiten*), see law 58
Productive 69–70
Professionalization 8, 20–21, 84, 114, 306
professionalizing 270
Progressive tradition 58
Psychologism 210, 225
Psychology
developmental 117, 120, 214
existential 210
history of (see under history)
introspective method in 97–104
methodology in 107–113
philosophical problems of 209–222

Reality
psychoanalytic 210
social 76, 240, 370
Reason 193
Recapitulation theory 118
Refugee scientists 187
Relations
German-Polish 60

Religion 190–193, 269–271
Reproduction
theory in discipline formation 21–23, 25, 70, 135
Resources, allocation of 10
Research collective 9
Revolution
bourgeois democratic 76
French 235
industrial 71
intellectual and social 227–228, 239–240
scientific 141–144, 149
scientific-technological 41, 45, 191
Revolutionary stages 202
post-revolutionary 226
Rockefeller Foundation 186
Romantic, Romanticism 191, 235–237, 238, 260–261, 335, 404, 408, 410

Salons 57, 401–412
Schools 5, 8, 25, 335, 418, 420
Berlin 81, 51
Cornell 102
Hegelian 254
Herbart 254
Kantian 254
technical 382
Würzburg 100
Science
finalization of 47
growth of 44–46, 54
historiography of 59
ideology in 90
modern 197
normal 218
organization of 6
and practice 315
pure 316
rational basis for 181
science of 44
structure of 202
studies 1, 9, 199, 202
theory of 44, 248
Scientific
naturalism 270
policy relations with Soviet Union 387
Scientification (*Verwissenschaftlichung*) 45
Self organization 29, 31, 34, 216
Sociability (see culture) 237
Social
construction 418–419
Social Darwinism 282–286
Social Democrat 186
theory 236
tolerance 408
Socialism 7, 41
Socialist Unity Party (*Sozialistische Einheitspartei Deutschlands, SED*) ix
Sociology
of science 226
Societies, scientific 260
Solvay Conference 151
Space
geographical 372–373
mathematical 169
space-time coordinates 171
actions in time and s. 201
space, time, and motion 252
Spirituality 194
Subject-object identity 345
Superconductivity 181–182, 189
System 237–238, 340, 345

Teaching (instruction) 9, 352, 419
Technology 59
development of 423
information 46
organic 281
science and technology 49
substitute t. for magic 196
Theology 180, 192–194, 269–277
Theory, theories 30–35, 44, 60, 80, 83, 92
of affinity 155
of chaos 174
chemical 315
of conductivity 155
contact t. 354

construction 181
deductive 182
of electromagnetic radiation 142–144
heat theorem (*Wärmetheorem*) 152, 156–157
quantum 142, 148–149, 151–160, 163–166, 177–188
physical 163
of space 370
of superconductivity 185
transformation theory for matrices 184
universal 92
of veins 333
Theoretical systems 43
Thermodynamics 141, 151
Transcendental reason 193
Transcendental logic 247
Truth 47, 197
living the t. 195
what is to count for t. 269
scientific 420

Uncertainty relation (see determinism) 168
Undergraduate examination (*Diplomprüfungsordnung*) 114
United States 103, 383–384
Unification 1, 6

Validity 252
Values (value) 20, 89, 108, 195, 210, 218–219, 229–230, 368

War xiii, 280, 283–284
Word, The 193, 195
World view (*Weltanschauung*) xv, 4–7, 10, 41, 44, 47, 49, 360, 367–368, 372, 375
World picture (*Weltbild*) 5, 141, 243

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