

# *Design & Systems*

GENERAL APPLICATIONS  
OF METHODOLOGY

## **PRAXIOLOGY:**

*The International Annual of Practical  
Philosophy & Methodology*  
*Volume 3*

Edited by

Arne Collen  
Wojciech W. Gasparski



**Transaction Publishers**  
New Brunswick (U.S.A.) and London (U.K.)

Copyright © 1995 by Transaction Publishers, New Brunswick, New Jersey 08903

Library of Congress Catalog Number: 93-6404  
ISBN: 1-56000-187-9  
Printed in the United States of America

---

## **DESIGN AND SYSTEMS**

### **GENERAL APPLICATIONS OF METHODOLOGY**

### **Praxiology: International Annual of Practical Philosophy and Methodology, Volume 3**

*Arne Collen and Wojciech W. Gasparski, editors*

Praxiology starts from the point of view of effectiveness. It has three components: analysis of concepts involving purposive actions; critique of modes of action from the viewpoint of efficiency; and normative advisory aspects in recommendations for increasing human efficiency. The third volume of this series aims to make more visible to the English readership the importance of design throughout the many disciplines, professions, and arenas of human endeavor.

Design is a pervasive part of our daily lives to such an extent that it goes largely unnoticed. It has become a near invisible aspect of our civilized existence. But when we stop for a moment to study an artifact, activity, group, and institution, or any entity or life process, we can begin to see and imagine the design, the designing, and the human designers who contributed to it.

*Design and Systems* represents a set of contributions made to the methodological study of design. Chapters and contributors include: "Toward Metamedicine" by Kazem Sadegh-Zadeh; "Design Engineering Methodologies in English and German Language Regions and Influences of Culture" by Wolfgang E. Eder; "Systems Methodology and Design" by Gerald Nadler; "Problem Forming, Problem Finding, and Problem Solving in Design" by Herbert A. Simon; and "Design: A Journey to the Future" by Bela H. Banathy. *Design and Systems* continues the trend of original research done in a little-known, but important area. It will be an enlightening read for sociologists, philosophers, and scholars interested in the study of design.

*Arne Collen* is Full Professor of Psychology and Human Science at Saybrook Institute Graduate School and Research Center in San Francisco, California.

*Wojciech W. Gasparski* is editor in chief of the Praxiology Annual. He is president of The Learned Society of Praxiology, and affiliated as a professor with the Institute of Philosophy and Sociology of the Polish Academy of Science.

ISBN: 1-56000-187-9 (cloth)	\$49.95
<b>October 1994</b>	<b>480 pp.</b>

*Related volumes*

#### **PRACTICAL PHILOSOPHY AND ACTION THEORY**

#### **PRAXIOLOGY: INTERNATIONAL ANNUAL OF**

#### **PRACTICAL PHILOSOPHY AND METHODOLOGY, VOLUME 2**

*Timo Airaksinen and Wojciech W. Gasparski, editors*

ISBN: 1-56000-094-5 (cloth)	\$49.95(s)
<b>1993</b>	<b>319 pp.</b>

#### **PRAXIOLOGIES AND THE PHILOSOPHY OF ECONOMICS**

#### **PRAXIOLOGY: INTERNATIONAL ANNUAL OF**

#### **PRACTICAL PHILOSOPHY AND METHODOLOGY, VOLUME 1**

*J. Lee Auspitz, Wojciech W. Gasparski, Marek K. Mlicki, and  
Klemens Szanjawska, editors*

ISBN: 1-56000-003-1 (cloth)	\$89.95(s)
<b>1992</b>	<b>707 pp.</b>

GENERAL  
APPLICATIONS  
OF METHODOLOGY

# Design *&* Systems

PRAXIOLOGY:

*The International Annual of Practical  
Philosophy & Methodology*

Volume 3

Edited by

Arne Collen  
Wojciech W. Gasparski

# *Design & Systems*

GENERAL APPLICATIONS  
OF METHODOLOGY

*PRAXIOLOGY:*

*The International Annual of Practical  
Philosophy & Methodology  
Volume 3*

Edited by

Arne Collen  
Wojciech W. Gasparski



Transaction Publishers  
New Brunswick (U.S.A.) and London (U.K.)

# Contents

Copyright © 1995 by Transaction Publishers, New Brunswick, New Jersey 08903

All rights reserved under International and Pan-American Copyright conventions. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without prior permission in writing from the publisher. All inquiries should be addressed to Transaction Publishers, Rutgers—The State University, New Brunswick, New Jersey 08903.

This book is printed on acid-free paper that meets the American National Standard for Permanence of Paper for Printed Library Materials.

Library of Congress Catalog Number: 93-6404  
ISBN: 1-56000-187-9

Printed in the United States of America

Library of Congress Cataloging-in-Publication Data

Projektowanie i systemy. English  
Design and systems: general applications of methodology/edited by  
Anne Collen, Wojciech W. Gasparski.  
P. cm. — (Praxiology; v. 3)

"But for few exceptions, this collection of articles was originally published in a Polish annual 'Projektowanie i Systemy', co-edited by Wojciech W. Gasparski and Danuta Miller . . ."—Pref.  
Includes bibliographical references.

ISBN 1-56000-187-9

1. Engineering design. 2. System analysis. I. Collen, Anne. II. Gasparski, Wojciech W. III. Title. IV. Series: Praxiology (New Brunswick, N.J.); vol. 3.  
TA174.P7613 1993  
620'.0042—dc20

93-6404  
CIP

Preface, *Wojciech W. Gasparski*

ix  
xi  
Introduction: Designs, Designing, and Designers,  
*Arne Collen*

## PART ONE: Background

Designing and Systems, *Wojciech W. Gasparski* 3  
Contemporary History of Design Science,  
*Wojciech W. Gasparski, Sydney A. Gregory, Richard Foqué, and Andrzej Strzalecki* 15

The Methodology of Practical Skills: Concepts and Issues,  
*Tadeusz Kotarbinski* 25

## PART TWO: Some Methodologies of the Practical Disciplines

The Nature and Methods of Practical Philosophy,  
*Timo Airaksinen* 41  
Toward Metamedicine, *Kazem Sadegh-Zadeh* 53

## PART THREE: Cultural Context

Design Engineering Methodologies in English and German Language Regions and Influences of Culture,  
*Wolfgang E. Eder* 65  
Si duo dicunt idem non est idem; or On Design Methodology as Seen from Neither an English Nor a German Speaking Country, *Wojciech W. Gasparski* 83

<b>PART FOUR: Achievements</b>	
Review of Design Methodology, <i>Ludwik Finkelstein and Anthony C. Finkelstein</i>	95
Systems Methodology and Design, <i>Gerald Nadler</i>	123
Any Progress in Systematic Design? <i>Alan H. Bridges</i>	155
<b>PART FIVE: Attitudes</b>	
A Theoretician and a Practitioner Towards the Future: A Methodological Note, <i>Tadeusz Kotarbinski</i>	171
The Multiple Perspective Concept, <i>Harold A. Linstone et al.</i>	177
<b>PART SIX: Design Process</b>	
Problem Forming, Problem Finding, and Problem Solving in Design, <i>Herbert A. Simon</i>	245
Designing: Worlds, Rules, and Types, <i>Donald A. Schön</i>	259
Design Processes — A State Space Perspective, <i>Donald C. Gauss and Eric Minch</i>	281
Design Learning and Learning Design Systems, <i>Arne Collen</i>	299
<b>PART SEVEN: Limitations</b>	
Some Limitations of the Argumentative Model of Design, <i>Thorbjørn Mann</i>	311
Limitations in Designer's Study of a Sphere of Reality, <i>Danuta Müller</i>	335
<b>PART EIGHT: Evaluation and Decisions</b>	
Decisions in Design: Analyzing and Aiding the Art of Synthesis, <i>James A. Wise</i>	347
Philosophy and/or Psychology of Discovery: A Reinterpretation, <i>Andrzej Szuzałek</i>	379
<b>PART NINE: Social Aspects</b>	
Design as an Object of Sociological Reflection and Study, <i>Robert Sobiech</i>	389
On Designer's Responsibility, <i>Andrzej Sicinski</i>	403
<b>PART TEN: Education</b>	
A Course in Generic Design for Engineers, <i>John N. Warfield</i>	415
Design: A Journey to the Future. A Map of the Journey, <i>Bela H. Banathy</i>	439
<b>PART ELEVEN: Future Perspectives</b>	
From the Boston Manifesto to the Chios Declaration: A New Challenge for the "Designing and Systems" Studies, <i>Wojciech W. Gasparski</i>	451
Concluding Remarks: Emerging Issues and Paradoxes, <i>Arne Collen</i>	459

Philosophy  
Policy Studies

**Design and Systems**  
General Applications of  
Methodology  
Praxiology: The International  
Annual of Practical  
Philosophy and  
Methodology, Volume 3

**Arne Collen and Wojciech  
W. Gasparski, editors**

Praxiology starts from the point of view of effectiveness. It has three components: analysis of concepts involving purposive actions; critique of modes of action from the viewpoint of efficiency; and normative advisory aspects in recommendations for increasing human efficiency. The third volume of this series aims to make more visible to the English readership the importance of design throughout the many disciplines, professions, and arenas of human endeavor.

Design is a pervasive part of our daily lives to such an extent that it goes largely unnoticed. It has become a near invisible aspect of our civilized existence. But when we stop for a moment to study an artifact, activity, group, and institution, or any entity or life process, we can begin to see and imagine the design, the designing, and the human designers who contributed to it.

*Design and Systems* represents a set of contributions made to the methodological study of design. Chapters and contributors include: "Toward Metamedicine" by Kazem Sadegh-Zadeh; "Design Engineering Methodologies in English and German Language Regions and Influences of Culture" by Wolfgang E. Eder; "Systems Methodology and Design" by Gerald Nadler; "Problem Forming, Problem Finding, and Problem Solving in Design" by Herbert A. Simon; and "Design: A Journey to the Future" by

(Continued on back flap)

(Continued from front flap)

Bela H. Banathy. *Design and Systems* continues the trend of original research done in a little-known, but important area. It will be an enlightening read for sociologists, philosophers, and scholars interested in the study of design.

**About the Editors**

**Arne Collen** is Full Professor of Psychology and Human Science at Saybrook Institute Graduate School and Research Center in San Francisco, California.

**Wojciech W. Gasparski** is editor in chief of the *Praxiology Annual*. He is president of The Learned Society of Praxiology and taught as a professor with the Institute of Philosophy and Sociology of the Polish Academy of Science.

Library of Congress: 88-6404  
Printed in the U.S.A.  
Jacket design by Karen M Surowiec