

DISCRETE THOUGHTS

Essays on Mathematics, Science, and Philosophy

Mark Kac, Gian-Carlo Rota, and Jacob T. Schwartz

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Revised and Corrected Edition
with the assistance of
Peter Renz



Springer Science+Business Media, LLC

Revised Edition
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Printed on acid free paper.

© Springer Science+Business Media New York 1992

Ursprünglich erschienen bei Birkhäuser Boston 1992



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ISBN 978-0-8176-3636-4

ISBN 978-0-8176-4775-9 (eBook)

DOI 10.1007/978-0-8176-4775-9

9 8 7 6 5 4

Dedicated to Nick Metropolis

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PREFACE

IN MATHEMATICS, as anywhere today, it is becoming more difficult to tell the truth. To be sure, our store of accurate facts is more plentiful now than it has ever been, and the minutest details of history are being thoroughly recorded. Scientists, PR-men and scholars vie with each other in publishing excruciatingly definitive accounts of all that happens on the natural, political and historical scenes.

Unfortunately, telling the truth is not quite the same thing as reciting a rosary of facts. José Ortega y Gasset, in an admirable lesson summarized by Antonio Machado's three-line poem, prophetically warned us that

the reason people so often lie
is that they lack imagination:
they don't realize that the truth, too,
is a matter of invention.

Sometime, in a future that is knocking at our door, we shall have to retrain ourselves or our children to properly tell the truth. The exercise will be particularly painful in mathematics. The enrapturing discoveries of our field systematically conceal, like footprints erased in the sand, the analogical train of thought that is the authentic life of mathematics. Shocking as it may be to a conservative logician, the day will come when currently

Preface

vague concepts such as motivation and purpose will be made formal and accepted as constituents of a revamped logic, where they will at last be allotted the equal status they deserve, side-by-side with axioms and theorems. Until that day, however, the truths of mathematics will make only fleeting appearances, like shameful confessions whispered to a priest, to a psychiatrist, or to a wife.

In the nineteenth chapter of "The Betrothed," Manzoni describes as follows the one genuine moment in a conversation between astute Milanese diplomats: "It was as if, between acts in the performance of an opera, the curtain were to be raised too soon, and the spectators were given a glimpse of the half-dressed soprano screaming at the tenor."

Today, as in the last century, what rare glimpses of genuine expression we ever get will be found in offhand remarks hidden within an ephemeral essay we have allowed ourselves to write in a moment of weakness, or as a casual revelation inserted between the lines of some overdue book review. It takes chutzpah, and the nudging of an indulgent publisher, to bring anyone to the point of opening the drawer, grabbing the yellowed reprints of his occasional scribblings, and stringing them in the misleading linear order of chapters of what will optimistically be billed as a book. Yet, this is what three authors have jointly conspired to do here. They offer no excuses for their presumption, but they have not abandoned hope for the leniency that is granted to the accused after their fumbling attempts at telling the truth.

February 7, 1985
GIAN-CARLO ROTA

ACKNOWLEDGMENTS

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- 22 Reprinted by the permission of the Springer-Verlag, New York, New York
- 12 Reprinted by the permission of the American Mathematical Society
- 13 Reprinted by the permission of the Editor, Journal of the Franklin Institute
- 14 Reprinted by the permission of Martinus Nijhoff Publisher B.V., Netherlands
- 15 Reprinted by the permission of the World Research, Inc., San Diego, California
- 16 Reprinted by the permission of W.H. Freeman and Company, San Francisco
- 5, 18 Reprinted by the permission of the publisher, The Rockefeller University Press

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