

Karl Terzaghi

The Engineer as Artist

Richard E. Goodman

ASCE
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1801 Alexander Bell Drive
Reston, Virginia 20191-4400

ABSTRACT: After five years of research—reading and translating 82 volumes of Terzaghi's diaries, interviewing acquaintances, and perusing 15,000 letters, numerous essays, publications, and reports—Dr. Goodman has developed this biography of Karl Terzaghi, the father of soil mechanics. Foreword by Ralph Peck.

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Goodman, Richard E.

Karl Terzaghi : the engineer as artist / Richard E. Goodman.

p. cm.

Includes bibliographical references and index.

ISBN 0-7844-0364-3

1. Terzaghi, Karl, 1883-1963. 2. Civil engineers—biography. 3. Engineering geology—History. I. Title.

TA140.T36G66 1998

624'.092—dc21

[b]

98-31764

CIP

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Library of Congress Catalog Card No.: 98-31764

ISBN 0-7844-0364-3

Manufactured in the United States of America



*...gradually I learned that even when it looked absolutely hopeless,
“the Master” Vigeland could always find a solution.
Thanks to his ingenuity alone it has been possible to do
the impossible. But exacting he is, and extremely demanding.*

From a statement by wrought-iron craftsman Mikkelsen
concerning the great Norwegian sculptor Gustav Vigeland (1869–1943).





To Ralph B. Peck

*A courageous, strong, and honest human being
whose teaching, writing, speaking, and practice of civil engineering
continue to light the way.*



Acknowledgements

Although the author never met Karl Terzaghi, a remarkably complete paper trail provided the opportunity to become very well informed about his life and thoughts. Fortunately, Terzaghi savored his words and saved them—not only in diaries, correspondence, manuscripts, and publications, but also notes, sketches, workbooks, memoranda, clippings, wine-bottle labels, and more. Much of this voluminous record has been preserved in the Terzaghi Library at the Norwegian Geotechnical Institute in Oslo, thanks to the farsightedness of its first director, Laurits Bjerrum, and the continuing stewardship of successive directors, including Kaare Hoeg and the present leader Suzanne Lacasse. A series of librarians developed this collection, including Unni Oiseth, Margareth Grini, Guri Rollum, and Wenche Enersen, the current custodian of the Terzaghi Library at NGI. The author was highly privileged to visit the Terzaghi Library four times, the first when Laurits Bjerrum read him remarkable diary excerpts, and the last three from 1993–1996 to pursue research for this book. He feels very fortunate to have received every opportunity to study the collections, pester the librarians and engineering staff, and almost take root in Oslo, thanks to appointment as a Terzaghi Scholar, with financial support for living expenses.

In addition to materials at the Terzaghi Library, the author was extremely fortunate to acquire from Karl's daughter Dr. Margaret (Peggy) Terzaghi-Howe the opportunity to read through Terzaghi's personal diaries (some 82 handwritten volumes) and a number of old, personal letters that had been stored in the attic at "Bear's Corner" in Maine. Through her help he was also privileged to review many of Karl Terzaghi's photographs, slides, and movie films, and the correspondence files of Ruth Terzaghi. In addition, through the kindness of Leo Casagrande's son Dirk, he reviewed correspondence in the office of Casagrande Consultants in Arlington, Mass. Professor Gerald (Jerry) Leonards provided correspondence, reports, and manuscripts from Professor Gregory Tschobotarioff, which had been left in his care at

Purdue University. J. Barry Cooke offered his personal correspondence and files of Terzaghi articles. Later, Walter Ferris provided an opportunity to read his carefully compiled set of notes for Terzaghi's Engineering Geology 260 at Harvard (which Mr. Ferris taught after Karl's retirement). Others, including Harald Lauffer, Charles Ripley, and Professors Laurie Richards and Robert Schiffman, provided additional items of correspondence.

Initial support for expenses to conduct interviews was provided from the author's honorarium as holder of the Edward G. Cahill and John R. Cahill Chair for Civil Engineering at the University of California, Berkeley. The author also received a helpful grant from the Committee on Research at U.C. Berkeley.

Most helpful advice and information was provided in a series of interviews with Terzaghi's colleagues, friends, and family. Professor Ralph Peck provided a great amount of information on the circumstances of their collaboration and friendship over the last 24 years of Karl's life. Professor Peck also suggested candidates for interviews. Charles Ripley, with his colleagues Cyril Leonoff and Mark Olson, reflected on their engineering adventures with Karl Terzaghi, during an inspiring two-day trip with the author to visit many of Terzaghi's job sites in British Columbia.

The wealth of personal data and historical perspective was increased by helpful interviews with J. Barry Cooke, and Professors Alec Skempton, Gerald Leonards, Robert Schiffman, and Leonardo Zeevaert. The author also profited from discussions with Karl's son Eric Terzaghi, his grandson Sergei Terzaghi (a practicing geotechnical engineer), Henry Grace, Elmo di Biagio, Jack Forester, Dirk Casagrande, Erna Casagrande, Carla Maria Casagrande, and Professors Heinz Brandl, Nilmar Janbu, Reint de Boer, Ralph Fadum, Richard Jelinek, Gordon Prescott, John Christian, Kemal Ozodogru, and William Judd.

Fortunately it was possible for the author to visit some of the places in Austria where parts of Terzaghi's story unfolded. Terzaghi's relatives Grete Byloff, Elizabeth Puchwein, and Werner Byloff showed him the rooms where Karl lived and visited in Graz. Members of the Vandalia Corporation proudly showed their house in Graz and allowed him to photograph the Terzaghi pictures on display (and gave him a quick lesson in the art of dueling). Professors Gunter Riedmüller and Wulf Schubert gave him opportunity to sample academic life in Graz by appointing him as a visiting professor at their (and Terzaghi's) college, the Technische Hochschule in Graz; while visiting in Graz, Library Director Dr. Karl Stock arranged to locate Karl's report cards and some of Wittenbauer's published theater pieces from the Graz Technische Hochschule's library and archives and supplied the picture of Professor Wittenbauer reprinted here. Mr. Ivan Vrkljan guided the author on a trip through the Croatian karst. Prof. Brandl, the current holder of Terzaghi's position at Vienna Technische Hochschule, showed him Terza-

ghi's offices, teaching rooms and laboratories and some of the original soil testing devices maintained there as well as important relevant reports and publications of his institute.

Finally the author is pleased to thank those who helped in the business of research and writing. Ulrike Makurat and Helmut Lewis helped him to improve his knowledge of German and Sieglinde Wegener Gisholt helped him to decipher old letters that had been written in Gothic German script. Professor and Mrs. Rainer Poisel and Professor Dobroslav Znidarcic provided information about Austrian and Yugoslavian history. Anni Pendl obtained photographic copies of portraits borrowed from Grete Byloff. The author is grateful to his brother Arnold P. Goodman, literary agent, who generously offered expert counsel. Finally the author wishes to acknowledge and thank his wife Sue who listened to and criticized drafts of the manuscript read to her in their retreat at Mendocino, California.

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Foreword

As the reader of this book will discover, it was my privilege to work for and with Karl Terzaghi for much of the last 30 years of his life. Certainly no other person, with the possible exception of my father in my precollege years, had as great an influence on my professional career as Terzaghi, and I came to feel that I knew him well. He was a tough taskmaster, he expected and demanded much, but he was patient and constructive in his criticism. Above all, he had the ability to make every endeavor on which we cooperated become a new voyage of discovery in what we now call geotechnical engineering. He created a sense of excitement that heightened as the job or project continued. He made me feel that I was a part of the development of our profession. Over dinner, after a day of technical work, he would discuss the state of some aspect of soil mechanics, the contributors to the work, the open questions, the blind alleys, the likely roads to progress. He was in touch, in person or by correspondence, with everyone serious about the subject, and he encouraged my independent thoughts about the merits of the work and the workers. Those were indeed stimulating evenings, and through them I came to feel that I knew not only the work but those who carried it out. We struggled over parts of "Soil Mechanics in Engineering Practice" to the point that I (and probably he) was frequently disheartened, but still I felt we had a mutual problem and that eventually we would find a mutually satisfactory conclusion. We became at times exasperated with each other, but never did he become angry. It was a remarkably stimulating relationship to me, and he made me feel as if I were a key player far beyond the reality.

So I came to know him. Yet, as he often would talk about his earlier experiences, I also knew that there was a half-century of his life about which I knew almost nothing except for an occasional reference or anecdote. I knew he had a deep philosophical questioning, that he had been a challenge to the authorities in his college days, that he had a tempestuous personal life before he met Ruth, with whom he found personal and intellectual

fulfillment. I knew only bits and pieces, wondered how they combined to make such a remarkable man, but could only wonder.

Then came this book. I am confident that nobody, not even Arthur Casagrande or Ruth, knew Karl as Dick Goodman has come to know him. Through his interviews, his study of Karl's reports and letters, and especially through his heretofore untranslated and unread diaries, Goodman has come closer to the real man than anyone else ever did. As the reader will see, Terzaghi was one of a kind, to the great benefit of civil engineering and, indeed, of mankind. The reader will be fascinated by his personality, his approach, and his accomplishments - as indeed was I, who thought I knew him.

If the reader wonders whether this book can possibly be an accurate reflection of Terzaghi's life, I can say only that the account of that part of his life that I knew, those last 30 years rings true. Further, the accounts of those occasional glimpses that I saw of Karl's earlier life, as disclosed in some of his writings and reminiscences, also ring true. Goodman's is a totally consistent picture of the man as I knew him; it is safe to say that it is a totally consistent picture of the whole man. I certainly know Karl Terzaghi immeasurably better, and appreciate him immeasurably more, after reading this book.

Ralph B. Peck

June 15, 1998

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