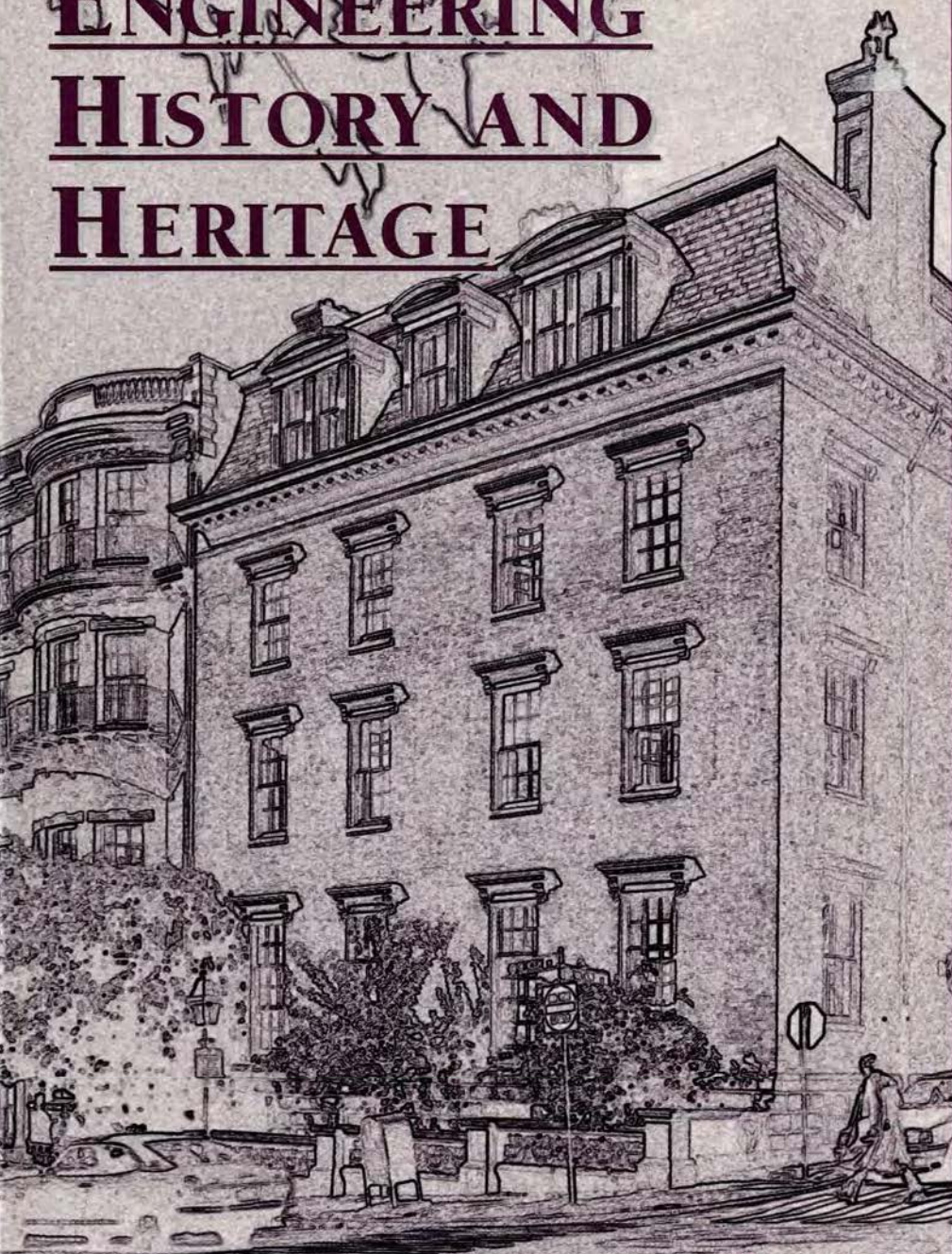


ENGINEERING HISTORY AND HERITAGE



ASCE

EDITED BY
JERRY R. ROGERS

Charlotte
Smith

ENGINEERING HISTORY AND HERITAGE

PROCEEDINGS OF THE SECOND NATIONAL CONGRESS ON
CIVIL ENGINEERING HISTORY AND HERITAGE

SPONSORED BY
ASCE Committee on History and Heritage
of American Civil Engineering (CHHACE),
The Boston Society of Civil Engineers
on their 150th Anniversary (1848–1998)
and the
National Park Service

October 17–21, 1998
Boston, Massachusetts

EDITED BY
Jerry R. Rogers

ASCE *American Society
of Civil Engineers*

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RESTON, VIRGINIA 20191-4400

Abstract: This proceedings, *Engineering History and Heritage*, contains papers presented at Second National Congress on Civil Engineering History and Heritage, held in conjunction with the ASCE Annual Convention in Boston, Massachusetts, October 18-21, 1998. In order to encourage the development of course material for the teaching of civil engineering history and heritage, this publication presents a variety of information on civil engineering history. Specific landmarks, such as the Moseley Riveted Wrought Iron Arch, are discussed, as are the programs involved in preserving engineering landmarks. In addition, other papers explore the history of underground engineering and construction. Finally, twelve geographic sections of the American Society of Civil Engineers provide information on the history of civil engineering in their areas of the country.

Library of Congress Cataloging-in-Publication Data

National Congress on Civil Engineering History and Heritage (2nd: 1998: Boston, Mass.)

Engineering history and heritage: proceedings of the Second National Congress on Civil Engineering History and Heritage / sponsored by the Committee on History and Heritage of the American Society of Civil Engineers (CHHACE), the Boston Society of Civil Engineers on their 150th anniversary (1848-1998), and National Park Service in conjunction with the ASCE National Convention in Boston, Massachusetts, October 17-21, 1998; edited by Jerry R. Rogers.

p. cm.

Includes bibliographical references and index.

ISBN 0-7844-0394-5

1. Civil engineering--United States--History--Congresses. 2. Civil engineers--United States--Congresses. I. Rogers, Jerry R. II. American Society of Civil Engineers. Committee on History and Heritage of American Civil Engineering. III. Boston Society of Civil Engineers. IV. United States. National Park Service. V. ASCE National Convention (1998: Boston, Mass.) VI. Title.

TA5.N314 1998

624'.0973--dc21

98-38924

CIP

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Library of Congress Catalog Card No: 98-38924

ISBN 0-7844-0394-5

Manufactured in the United States of America.

Engineering History and Heritage

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Editor/Coordinator: Second National Engineering History and Heritage Congress
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The 1998 National Engineering History and Heritage Congress is co-sponsored by the Boston Society of Civil Engineers (Anni H. Autio, Robert J. LoConte, and David L. Westerling), the National Park Service (Eric DeLony and Robie Lange), and the American Society of Civil Engineers (ASCE) Committee on the History and Heritage of American Civil Engineering (CHHACE) (Augustine J. Fredrich, William P. Johnson, Jr., Alan L. Prasuhn- Past Chair, Edward L. Robinson, Jerry R. Rogers-Chair, Malcomb L. Steinberg, and Jane Howell, Staff Liaison).

Presidents Luther W. Graef and Daniel S. Turner have challenged the ASCE Education Activities Committee and CHHACE to encourage the development of course material for the teaching of civil engineering history and heritage in universities. New engineering history and heritage course material is provided in the 1998 ASCE History Congress Proceedings which followed engineering history information in the 1996 National Symposium on Civil Engineering History and ASCE Proceedings ("**CIVIL ENGINEERING HISTORY: Civil Engineers Make History**") co-sponsored by CHHACE, the National Capital Section- ASCE, and the U.S. Capitol Historical Society. Also, an Engineering History and Landmarks Workshop held July 13, 1998 in Washington, D.C. with ASME, Education Activities Committee- ASCE, the National Park Service, CHHACE-ASCE, and 10+ professional societies and agencies recommended a permanent engineering history coordinating council and regular workshops. Therefore, there are new developments to discover new material for engineering history and heritage.

The Boston Society of Civil Engineers was founded 150 years ago in 1848 and the 150th Anniversary Celebration occurs during the 1998 ASCE Annual Convention in Boston. The Engineering History Field trips are the October 17-18 New England Covered Bridges Tour (Frank Griggs, Jr. and BSCES Historians) and the October 18 Lowell National Industrial Park Tour (Lawrence R. Keats and Robert J. LoConte). The Boston National Engineering History and Heritage Congress Sessions and Coordinators included the Annual ASCE National History and Heritage Breakfast (Speaker: Augustine J. Fredrich: "European Medieval Cathedrals,"), "Three Centuries of Engineering Aesthetics" (Reuben F. Hull, Jr. and Frederick M. Law), "150 Years of Underground Construction" (Ronald C. Hirschfeld), "These Olde Pyramids- the Sphinx and the Pyramids of Egypt" (Robert J. Kachinsky and Robert J. LoConte), "The Boston Society of Civil Engineers 150th Anniversary Dinner at the Phillips Winthrop House and Tour" (Anni H. Autio and David L. Westerling), "National

Engineering Historical Landmarks and History- Parts I and II” and the “Big 12 Sections History Congress” (Jerry R. Rogers).

The first ASCE Sections History Congress is particularly interesting due to excellent papers from ASCE Sections in Los Angeles, Seattle, Inland Empire/Spokane, Colorado, Texas, St. Louis, Tennessee/Nashville (where the ASCE 150th Anniversary Convention will be held in 2002), National Capital, Maryland, Metropolitan, Buffalo, and Philadelphia.

Special acknowledgments go to the 1998 ASCE National History and Heritage Award winners: Irving Sherman- Los Angeles Section- ASCE and Joe E. Colcord-Seattle Section- ASCE and the Philadelphia Section- ASCE for receiving the 1998 Presidential/CHHACE Outstanding Section Award. Also, special thanks go to Jane Howell, Gayle Fields, Alan L. Prasuhn, and Edward L. Robinson for the revised ASCE history and heritage guidebook. The new, attractive ASCE guidebook has much information for educators, practitioners, and students interested in civil engineering history, heritage and landmarks. **Copies of the new ASCE Guidebook may be obtained from ASCE Washington Office/CHHACE, 1015- 15th Street, N.W., Suite 600, Washington, D.C. 20005-2605.** The Los Angeles Section- ASCE is to be commended for putting together their numerous landmarks with digital photographs suitable for the internet educational media with a special regional presentation August 20 at the Huntington Library. Neal FitzSimons is working with ASCE and Michael Kupferman with Frank Griggs, Jr. to develop the ASCE Landmarks and engineering history timeline on the Internet by the fall of 1998. Also, the Metropolitan Section- ASCE has a most attractive booklet of landmarks in the New York City region. Several ASCE Sections are doing great projects to inform and educate people on civil engineering projects, history and heritage.

The third ASCE Engineering History and Heritage Congress is being planned for the Houston, Texas ASCE Annual Convention in 2001. The 2001 National/International Engineering History and Heritage Congress and ASCE Proceedings will include international engineering societies and history, more Sections Engineering History Sessions, National Engineering History and Heritage Sessions, and the beginning of the 150th ASCE Anniversary, culminating at the Nashville ASCE Convention Celebration.

Commemorative Print

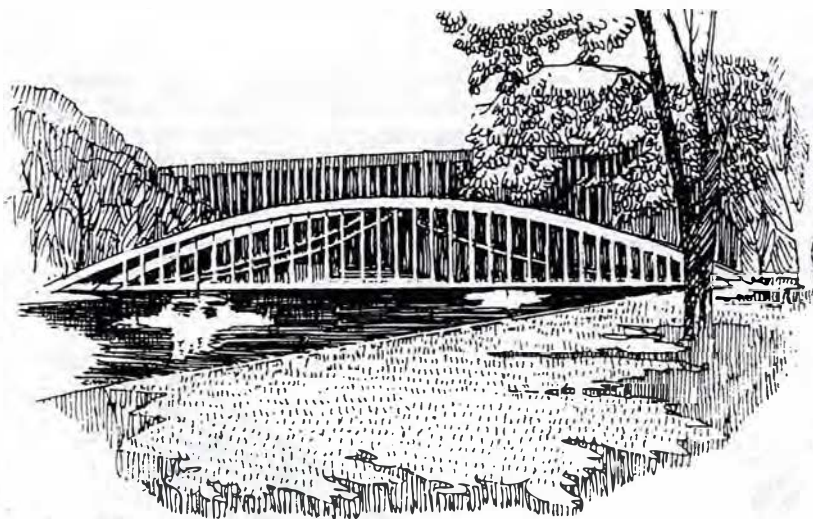
As a lasting tribute to 150 years of civil engineering accomplishments, the Boston Society of Civil Engineers Section/ASCE commissioned architect Frederick "Fritz" T. Kubitz to produce a 150th Anniversary commemorative pen-and-ink print of a collection of local significant civil engineering works. Of the projects represented in the collage, the Canton Viaduct, built in 1835, and the Moseley Bridge, built in 1864, will be dedicated in 1998 as ASCE National Historic Civil Engineering Landmarks. Copies of the commemorative print are on sale at The Engineering Center. Proceeds from the sale will be donated to The Engineering Center Education Trust.



Canton Viaduct, Canton, MA

1998 National Historic Civil Engineering Landmark

Opened in 1835, the Canton Viaduct has been and will be in continuous service to high speed rail to 1999 and beyond. This 21-arch granite masonry bridge was uniquely designed with hollow spaces between walls, connected by solid buttresses between arches. The slightly curved, functional bridge is 615 feet long, 70 feet high, and 22 feet wide.



Moseley Wrought Iron Arch Bridge, North Andover, MA
1998 National Historic Civil Engineering Landmark

Designed, patented in 1857, and built by Thomas W.H. Moseley in 1864, this arched 96- foot span bridge incorporated for the first time in the United States, the use of riveted wrought iron plates for the triangular- shaped top chord and preceded by years the standard use of wrought iron for bridges.

CREDIT FOR COVER ILLUSTRATION

Phillips Winthrop House
Home of The Engineering Center and BSCES/ASCE

Since 1990, the Phillips Winthrop House, One Walnut Street, has been the home of The Engineering Center and the Boston Society of Civil Engineers Section/ ASCE. The BSCE was founded in 1848 and the 1998 Engineering History and Heritage Congress October 17-21, 1998 in Boston marks the 150th Anniversary Celebration of the BSCE. The Phillips Winthrop House was built in 1804 and was a product of Charles Bullfinch, the leading architect of his time.

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† HH1 represents 1998 National Engineering History & Heritage Congress Session: 1.

* Manuscript not available at time of printing.

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* Manuscript not available at time of printing.

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This proceedings commemorates the art of engineering through history and heritage. In an effort to encourage the development of course material and new approaches to the exploration of our history and heritage, this book presents a wealth of intriguing facts, stories and technical information on civil engineering past and present. These papers were presented at the Second National Congress on Civil Engineering History and Heritage which was held in conjunction with the ASCE Annual Convention in Boston, Massachusetts, October 18-21, 1998.

Papers examine specific landmarks, such as the Moseley Riveted Wrought Iron Arch, and programs to preserve these landmarks. In addition, topics include engineering history and heritage field trips, design and construction of medieval cathedrals, three centuries of engineering aesthetics, 150 years of underground engineering and construction, engineering and the pyramids, and engineering projects and celebrations throughout the United States. Twelve geographic sections of the American Society of Civil Engineers provide information on the history of civil engineering in their respective areas of the country.

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ISBN 0-7844-0394-5