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Principal Works: Volume 1
Samuel Smiles
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A political and social reformer, Samuel Smiles (1812–1904) was also a noted biographer in the Victorian period. Following the engineer's death in 1848, Smiles published his highly successful *Life of George Stephenson* in 1857 (also reissued in this series). His interest in engineering evolved and he began working on biographies of Britain's most notable engineers from the Roman to the Victorian era. Originally published in three volumes between 1861 and 1862, this work contains detailed and lively accounts of the educations, careers and pioneering work of seven of Britain's most accomplished engineers. These volumes stand as a remarkable undertaking, advancing not only the genre, but also the author's belief in what hard work could achieve. Volume 1 charts the engineering of early roads, embankments, bridges, harbours and ferries, as well as the lives of the engineers Sir Hugh Myddelton (c.1560–1631) and James Brindley (1716–72).

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With an Account of Their Principal Works

VOLUME 1

SAMUEL SMILES



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Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Mexico City

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9781108052924

© in this compilation Cambridge University Press 2012

This edition first published 1861

This digitally printed version 2012

ISBN 978-1-108-05292-4 Paperback

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OF
T H E E N G I N E E R S.

VOLUME I.

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Sir Hugh Myddellon, Knight & Baronet.

Engraved by W. Heil, after the portrait by Cornelius Jansen.

Published by John Murray, Albemarle Street, 1861.

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LIVES
OF
THE ENGINEERS,
WITH
AN ACCOUNT OF THEIR PRINCIPAL WORKS;
COMPRISING ALSO
A HISTORY OF INLAND COMMUNICATION IN BRITAIN.

By SAMUEL SMILES.

~~~~~  
" Bid Harbours open, Public Ways extend ;  
Bid Temples, worthier of God, ascend ;  
Bid the broad Arch the dang'rous flood contain,  
The Mole projected, break the roaring main ;  
Back to his bounds their subject sea command,  
And roll obedient rivers through the land.  
These honours, Peace to happy Britain brings ;  
These are imperial works, and worthy kings."  
POPE.

~~~~~  
WITH PORTRAITS AND NUMEROUS ILLUSTRATIONS.

VOL. I.

LONDON :
JOHN MURRAY, ALBEMARLE STREET.
1861.

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LONDON: PRINTED BY W. CLOWES AND SONS, DUKE STREET, STAMFORD STREET,
AND CHARING CROSS.

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P R E F A C E.



THE object of the following volumes is to give an account of some of the principal men by whom the material development of England has been promoted,—the men by whose skill and industry large tracts of fertile land have been won from the sea, the bog, and the fen, and made available for human habitation and sustenance; who have rendered the country accessible in all directions by means of roads, bridges, canals, and railways; and have built lighthouses, breakwaters, docks, and harbours, for the protection and accommodation of our vast home and foreign commerce.

Notwithstanding the national interest which might be supposed to belong to this branch of literature, it has hitherto received but little attention. When the author first mentioned to the late Mr. Robert Stephenson his intention of writing the Life of his father, that gentleman expressed strong doubts as to the possibility of rendering the subject sufficiently popular to attract the attention of the reading public. “The building of bridges, the excavation of tunnels, the making of roads and railways,” he observed, “are mere mechanical matters, possessing no literary interest;” and in proof of this he referred to the ‘Life of Telford’ as “a work got up at great expense, but which had fallen still-born from the press.”

Besides the apparent unattractiveness of the subject, its effective treatment involved the necessity of burrowing through a vast amount of engineering reports, which,

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next to law papers, are about the driest possible reading, except to those professionally interested in them.

Circumstances such as these have probably concurred in deterring literary men from entering upon this field of biography, which has hitherto remained comparatively unexplored. Hence, most of the Lives and Memoirs contained in the following series are here attempted for the first time. All that has appeared relating to Brindley, Smeaton, and Rennie, is comprised in the brief and unsatisfactory notices contained in Encyclopedias and Biographical Dictionaries. What has been published respecting Myddelton's life is for the most part inaccurate, whilst of Vermuyden no memoir of any kind exists. It is true, a 'Life of Telford' has appeared in quarto, but, though it contains most of that engineer's reports, the history of his private life as well as of his professional career is almost entirely omitted.

Besides the Lives of these more distinguished men, the following volumes will be found to contain memoirs of several meritorious though now all but forgotten persons, who are entitled to notice as amongst the pioneers of English engineering. Such were Captain Perry, who repaired the breach in the Thames embankment at Dagenham; blind John Metcalf, the Yorkshire road-maker; William Edwards, the Welsh bridge-builder; and Andrew Meikle, Rennie's master, the inventor of the thrashing-machine. Although the Duke of Bridgewater was not an engineer, we have included a memoir of him in the Life of Brindley, with whose early history he was so closely identified; and also because of the important influence which he exercised on the extension of the canal system and the development of modern English industry.

The subject, indeed, contains more attractive elements than might at first sight appear. The events in the

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lives of the early engineers were a succession of individual struggles, sometimes rising almost to the heroic. In one case, the object of interest is a London goldsmith, like Myddelton; in another, he is a retired sea-captain, like Perry; a wheelwright, like Brindley; an attorney's clerk, like Smeaton; a millwright, like Rennie; a working mason, like Telford; or an engine brakesman, like Stephenson. These men were strong-minded, resolute, and ingenious, impelled to their special pursuits by the force of their constructive instincts. In most cases they had to make for themselves a way; for there was none to point out the road, which until then had been untravelled. To our mind, there is almost a dramatic interest in their noble efforts, their defeats, and their triumphs; and their eventual rise, in spite of manifold obstructions and difficulties, from obscurity to fame.

It will be observed from the following pages that the works of our engineers have exercised an important influence on the progress of the English nation. But it may possibly excite the reader's surprise to learn how very modern England is in all that relates to skilled industry, which appears to have been among the very youngest outgrowths of our national life.

Most of the Continental nations had a long start of us in art, in science, in mechanics, in navigation, and in engineering. Not many centuries since, Italy, Spain, France, and Holland looked down contemptuously on the poor but proud islanders, contending with nature for a subsistence amidst their fogs and their mists. Though surrounded by the sea, we had scarcely any navy until within the last three hundred years. Even our fisheries were so unproductive, that our markets were supplied by the Dutch, who sold us the herrings caught upon our own coasts. England was then regarded principally as a magazine for the supply of raw mate-

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rials, which were carried away in foreign ships and partly returned to us in manufactures worked up by foreign artisans. We grew wool for Flanders, as America grows cotton for England now. Even the little manufactured at home was sent to the Low Countries to be dyed.

Most of our modern branches of industry were begun by foreigners, many of whom were driven by religious persecution to seek an asylum in England. Our first cloth-workers, silk-weavers, and lace-makers were French and Flemish refugees. The brothers Elers, Dutchmen, began the pottery manufacture; Spillman, a German, erected the first paper-mill at Dartford; and Boomen, a Dutchman, brought the first coach into England.

When we wanted any skilled work done, we almost invariably sent for foreigners to do it. Our first ships were built by Danes or Genoese. When the *Mary Rose* sank at Spithead in 1545, Venetians were hired to raise her. On that occasion Peeter de Andreas was employed, assisted by his ship-carpenter and three of his sailors, with "sixty English maryners to attend upon them." When an engine was required to pump water from the Thames for the supply of London, Peter Morice, the Dutchman, was employed to erect it.

Our first lessons in mechanical and civil engineering were principally obtained from Dutchmen, who supplied us with our first wind-mills, water-mills, and pumping-engines. Holland even sent us the necessary labourers to execute our first great works of drainage. The Great Level of the Fens was drained by Vermuyden; and another Dutchman, Freestone, was employed to reclaim the marsh near Wells, in Norfolk. Canvey Island, near the mouth of the Thames, was embanked by Joas Croppenburgh and his company of Dutch

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workmen.. When a new haven was required at Yarmouth, Joas Johnson, the Dutch engineer, was employed to plan and construct the works; and when a serious breach occurred in the banks of the Witham, at Boston, Matthew Hake was sent for from Gravelines in Flanders; and he brought with him not only the mechanics but the manufactured iron required for the work. The art of bridge-building had sunk so low in England about the middle of the last century, that we were under the necessity of employing the Swiss engineer Labele to build Westminster Bridge.

In short, we depended for our engineering, even more than we did for our pictures and our music, upon foreigners. At a time when Holland had completed its magnificent system of water communication, and when France, Germany, and even Russia had opened up important lines of inland navigation, England had not cut a single canal, whilst our roads were about the worst in Europe. It was not until the year 1760 that Brindley began his first canal for the Duke of Bridgewater.

After the lapse of a century, we find the state of things has become entirely reversed. Instead of borrowing engineers from abroad, we now send them to all parts of the world. British-built steam-ships ply on every sea; we export machinery to all quarters, and supply Holland itself with pumping engines. During that period our engineers have completed a magnificent system of canals, turnpike-roads, bridges, and railways, by which the internal communications of the country have been completely opened up; they have built lighthouses round our coasts, by which ships freighted with the produce of all lands, when nearing our shores in the dark, are safely lighted along to their destined havens; they have hewn out and built docks and harbours for the accommodation of a gigantic commerce; whilst their inventive genius

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has rendered fire and water the most untiring workers in all branches of industry, and the most effective agents in locomotion by land and sea. Nearly all this has been accomplished during the last century, much of it within the life of the present generation. How and by whom these great achievements have been mainly effected—exercising as they have done so large an influence upon society, and constituting as they do so important an element in our national history—it is the object of the following pages to relate.

It was the author's original intention to have begun this work with the Life of Brindley, the earliest of our canal engineers. But on mentioning the subject to the late Mr. Robert Stephenson—after the publication of his father's Life had shown that this class of biography was not so unattractive to general readers as he had apprehended—the author was urged by that gentleman to trace the history of English engineering from the beginning, and to include the labours of Vermuyden, and especially of Sir Hugh Myddelton, a person of great merit and boldness, considering the times in which he lived, and whom Mr. Stephenson considered entitled to special notice as being the First English Engineer. Memoirs of these men have accordingly been included in the series; and in preparing them the author has availed himself of the information afforded by the collection of State Papers, and (in the case of Myddelton) the Corporation Records of the City of London. He has also to acknowledge the valuable assistance of W. C. Mylne, Esq., engineer to the New River Company, and the Rev. H. T. Ellacombe, M.A., of Clyst St. George, Devon, a lineal descendant of Sir Hugh Myddelton.

The Life of Brindley has been derived almost entirely from original sources; amongst which may be mentioned the family papers in the possession of Robert Williamson,

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Esq., of Ramsdell Hall, Cheshire; the documents relating to the engineer in the possession of Lord Ellesmere, proprietor of the Bridgewater Canal; and the valuable MS. collection of Joseph Mayer, Esq., of Liverpool. The author has also to acknowledge information obtained from Robert Rawlinson, Esq., engineer to the Bridgewater Canal, relative to certain interesting details as to the execution of the works of that undertaking.

The materials for the Life of John Rennie have been mainly obtained from Sir John Rennie, C.E., who has kindly placed at the author's disposal the elaborate MSS. prepared by Sir John; descriptive of his father's great works; of which no consecutive account has been published until the present memoir.

The Life of Telford has been principally derived from a large collection of that engineer's confidential letters to his friends in Eskdale, in the possession of Mr. Little, of Carlesgill, near Langholm, containing Telford's own account of the early part of his career; whilst, in the later part, the author has had the assistance of Joseph Mitchell, Esq., and other gentlemen. In preparing this part of the work, the author has reversed the process adopted in the 'Life of Telford' already published: he has omitted the engineer's reports, but included the biography; by which method he believes the narrative will be found considerably improved.

The author's principal labour has consisted in compressing rather than in expanding the large mass of materials placed at his disposal. It would indeed have been much easier to devote two volumes to each of the following lives than it has been to comprise the whole of them within a like compass; but he believes that labour is well bestowed in condensing biography up to a certain point, provided no essential feature is omitted—the inte-

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rest and readableness of such narratives being very often in an inverse ratio to their length.

With the object of saving unnecessary verbal descriptions, illustrations, in the shape of maps, plans, and sections, have been introduced wherever practicable; and in those cases where a representation is given of a bridge, lighthouse, aqueduct, or harbour, it will be found set in its appropriate landscape. Although the dimensions of the wood engravings are necessarily small, every attention has been paid to accuracy of detail, most of them being drawn to scale.

The drawings by Mr. Percival Skelton—an excellent and graceful artist—have been made in nearly every case on the spot, for the express purpose of this work. Those by Mr. R. P. Leitch and Mr. Wimperis are mostly after original sketches supplied by distant correspondents; and it is hoped that the illustrations generally will be found to add to the interest of the volumes. The whole of the cuts have been executed by Mr. James Cooper, whose accuracy and carefulness in superintending the illustrative department of the work, the author takes this opportunity of acknowledging.

London, October, 1861.

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Cambridge University Press

978-1-108-05292-4 - Lives of the Engineers: With an Account of Their

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