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Technics and Architecture

The Development of Materials and Systems for Building

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Preface

This study gathers together stories of the production of building materials and the development of building equipment and other systems. These are the media in which architects work. They constitute the array of possibilities from which architects, builders, and investors make the choices that largely define the nature of a building, and because they are on the whole pragmatic departures, successful new materials and systems soon become accepted as necessities, elevating the standards of performance by which buildings are to be judged.

The accounts that follow focus on the period of the Industrial Revolution and the times that came after, with introductory descriptions of earlier events. Much of the narrative centers on England, where mechanization first flourished. Later, in the nineteenth century, leadership shifted to the United States, where the force of expansion generated opportunities for experimentation. Emphasis has been given to the general adoption of systems and materials, and “firsts” have been neglected because such claims are as a rule questionable.

The text has been divided into two parts. The first groups seven categories of building materials in an order that is roughly chronological. The second discusses nine systems of building functions, including five developed to improve comfort and convenience and four that embodied the technical and scientific knowledge of the period when they were developed. In some cases different chapters may share a subject, treating separate aspects. For instance, terra-cotta fireproofing is discussed both in the chapter devoted to the manufacture of that material and in the chapter dealing with problems of fire protection. Structural engineering related to a specific material (iron, steel, or reinforced concrete) is treated as an aspect

of that material's development and use, and general structural principles are considered in a chapter that reviews the foundations of structural theory and practice.

Each of these stories has its own character. In some cases, governmental and economic influences determined the outcome; in others, scientific discoveries or the growth of other industries may have controlled events. The distinctive characteristics of each story have been stressed, relinquishing a uniformity of treatment for the emphasis of individual features.

Beyond the matters discussed in this volume, there remain many subjects related to the construction industry, laborers in building crafts, the use of machines in construction, and other aspects of building and architecture. It is hoped that this volume may encourage scholars' study of such topics.