

Preface

There are two questions that any author of a professional book should answer: what is the purpose of the book, and why is the author the best person to write it?

In relation to this book, the response to the first question is that during the twentieth century the construction industry and its products and technology have changed drastically. This metamorphosis has been insufficiently appreciated and is worthy of consideration. In answer to the second question, I have spent a lifetime working in research and development in the construction industry, much of it on an international level. Furthermore, as a third-generation professional in the industry and the father of a fourth-generation architect, I have had a front-seat view of the events of a whole century. I therefore felt the provision of an overview of the industry to be almost an obligation.

Construction technology has developed in a signal way in the last 100 years. In an increasing number of subsectors, the most up-to-date technology is used and more of the buildings to be constructed are really high-tech products whose design requires modern scientific methods. The internal structure of the building industry is also changing. An internationalization of the market goes hand in hand with the emergence of construction multinationals, which themselves promote technical progress. Despite this, several publications have claimed that construction lags behind other industries, that construction technology has been the least modernized, that productivity in building has developed at a lower rate than elsewhere, and that it is still a labour-intensive economic sector with accident-prone and health-endangering work practices. It is argued that most building materials, such as stone, timber and even brick, have been around since ancient times, and that their use is based on empirical experience in which the need for scientific research is limited. It has also been claimed that the construction industry's foremost concern in the future will be the maintenance and repair of existing stock rather than new construction.

However I wish to demonstrate here that this is an unrealistic and pessimistic picture, that the construction industry has been much transformed and that it does face a challenging future. This book reflects on the changes that are contributing to the transformation of construction from an ancient craft to a modern industry, while restricting its scope to selected trends that seem to be important in this process. This book also demonstrates that although there is relatively less research in the building sector than there is in other industrial areas, much of the progress in construction originates in the work of designers and manufacturers, so that the technical progress is not restricted to the result of formal building research. The book also points out that the enhanced performance of the buildings and construction sector is largely ignored by economic indices such as productivity, which, again, has the consequence that not all progress is reflected by statistical data.

Construction is becoming a modern industry, co-operating as an active partner with various scientific disciplines such as the medical and social sciences, psychology, mathematics, physics and chemistry. At its best, it has become an important contributor to global energy conservation, protection of the environment and sustainable development. Because it is such a vast field, many subjects, problems or trends have been discussed only briefly. Readers who wish to become acquainted with the subject to a greater depth should refer to the titles listed at the end of each chapter. Indeed, one important objective of the book is to draw attention to areas that may not be common knowledge to experts in other fields, and provide further avenues of information on those topics. It is unfortunate that this book pays relatively little attention to the small-scale sector of the market, and thus to vernacular building. But with the objective of analysing the most advanced forms of construction, this was unavoidable.

The book is not aimed exclusively at practitioners or researchers. On the contrary, it seeks to reach a wider audience. Nevertheless, it also hopes to help bridge the gap between practice and research in the profession. Although practitioners may do valuable work within a certain geographic area or professional field, they are often unable to find the time to follow trends outside their areas. I hope that this book may help to broaden their outlook with its succinct description of the global trends in the various professional disciplines. At the same time, it may identify problems of practice that are in need of solutions from the researchers. It is also to be hoped that the book will be useful for the students of professions such as architecture, civil engineering, real estate, building and facility management, housing, urban planning, building economics, environment and building services.

A brief comment on the use of the terms 'building' and 'construction' is worth while. In this book, the processes and products of both building and construction are discussed without specifically indicating in which

sense the two terms are used; this should be obvious from the text. With regard to the products, selected buildings are as much discussed as civil engineering works. When discussing the industry itself, the whole construction industry is considered.

The chronology in the Appendix charts the technical progress, inventions and innovations in construction and innovative buildings. It also contains data not specifically included in the individual chapters. Understandably, the data collected from various sources are often conflicting or differing. I would therefore be grateful for any corrections that readers may like to forward to me.

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