

The tests given for application to each material suggest that steel may sometimes be more economical to use, because of its greater strength.

Part IV treats of Practical Construction:—the moulds, falsework, reinforcements, the advantages of moulding in place and in advance, and the method of constructing the different parts of a building and other structures to which the material can be applied. This part is copiously illustrated.

Parts V and VI are the theoretical backbone of the book. Part V, called Experimental Research and Deduced Data, gives an account, with diagrams, of experimental tests made of reinforced concrete structures and members. From observation of these experiments are deduced data for Part VI, on Calculations. This part after a preliminary section to establish the Necessary Hypotheses; and a section devoted to the theory of Loads, Bending Moments, Shearing Forces, etc., as applicable to reinforced concrete; goes at length into the question of Formulae, and the demonstration and establishment of Formulae for different stresses and reinforcements in different structural forms. A Proposed Method of Reinforcement and Calculation, which constitutes one section—a suggestion to reinforce pieces by hooping, to prevent the swelling of the concrete under compressive stresses, combining with it reinforcement on the tensile side to induce compressive stresses in the concrete—is one of the hints that changes in form may come; for the most effective form for hooped reinforcement is not rectangular but round.

Part VII gives an account and illustrations of structures that have been erected in reinforced concrete. These are piles, warehouses, chimney stacks, lighthouses, churches, houses, shops, factories, covered reservoirs both sunk and elevated, silos, markets, theatres, railroad signal cabins and water tanks, stand pipes, aqueducts, water pipes, sewers, cement bins, bridges in great variety, quays, balustrades, sidewalks, vault light slabs, canal and river bank protections, railroad sleepers, troughing for electric cables, retaining walls, and a jetty on posts. We speak of these headings as plural, without knowing whether some cases are not solitary; but the impression left by the chapter is of a veritable age of concrete.

BOOKS.

A HISTORY OF ARCHITECTURE by Professor Bannister Fletcher and Bannister F. Fletcher. Published by B. T. Batsford. Agent for Canada, Thomas Henry, 53 McGill St., Toronto. Price \$6.30, post paid.

This is the fifth edition of this History and it is visibly enlarged. The preface says that the greater part of the book has been re-written and that 700 new illustrations have been added.

The intention of the book is to apply scientific method to an account of the history of Architecture. Each style is treated in the same way. First the influences that brought the style into being are considered; influences Geographical, Geological and Climatic which affect the structure; influences Religious, Social and Political, which affect the character and condition of the builders; and Historical influences which affect the course of affairs from without. Then the character of the architecture, so produced, is described; that is to say its special quality is noted, and the general effect produced by the buildings as a whole. Next, examples

are given of particular typical buildings; and, finally, a comparative analysis, in which every style of architecture is regarded as the solution of certain fundamental problems viz.: Plan, Walls, Openings, Roofs, Columns, Mouldings and Ornament. Each building must have all or most of these parts and it is instructive to compare the solutions, by the different styles, of the problems these parts involve. In fact this is the true way to study the history of Architecture. The more extended the knowledge of how these problems have been solved in the past, the more just is likely to be the perception of how they should be solved in the present. It is by the study of all styles alike that the student acquires openness of mind to admit new ideas, and flexibility of mind to seize the point of view of other men; acquires, in one work, culture. The secret process of such study is however a continual process of comparison, instinctive and often unperceived, and therefore, to the unaided student, slow and sometimes insufficient to attain the result. The business of the Architectural Schools is to direct attention in this way. For this reason the History under review is a good text book for the Architectural Schools and for the examinations of the Associations; but more especially for the solitary student, who thus gets the advantage of tuition. The process of practical familiarity with any one style is a different process and less educative. It is a purely technical training which should come after and indeed must come after, or rather must have the general training come first, in order that there may be first a sure perception of the nature of design, without which the study of any one style is sure to degenerate into crude, unpractical and inartistic copyism.

It should be added, in order to give a full account of this book, that the chapter on each style concludes with a list of the books which treat of the style.

A HANDBOOK FOR SUPERINTENDENTS OF CONSTRUCTION, ARCHITECTS, BUILDERS, AND BUILDING INSPECTORS; by H. G. Richey, Superintendent of Construction U. S. Public Buildings. Published by John Wiley & Sons, New York. \$4.00.

This is a book of 742 pages, but printed on thin paper, bound in flexible Morocco, and convenient in shape for carrying in the pocket. It is a comprehensive work, intended both for study in the office and reference on the works. It has therefore a double character combining the sort of information usually met in text books with the sort usually found in handbooks. The operations of piling and foundations, stone and brick work, carpentry, plastering plumbing, &c., are described at length, with illustrations. To these are added a section on cement, reinforced concrete and terra cotta, fire-proof and slow burning construction, which is concerned to a great extent with the products and systems of patentees. Wiring, heating, paper-hanging and other adjunctive trades are also described. In fact it is in body a treatise on building operations. But combined with each part are the tables, formulae and other information necessary to carry out the building operations which it describes. There is also a part concerned with drawing and laying out work, and combined with it, the various tables of mensuration and the problems in geometrical mensuration required for such work.

In the main a compilation, there is evidently new matter in the book as well as new arrangement.