the construction scheme always taken from Perret, the docks of Casablanca. Who ever travelled in Northern Africa will see how mighty the power of the soil is. The construction has changed, this time in concrete, but in the repetition of vaulted elements like the dwellings of Troglodytes in Tunis.

As Africa influenced modern painting (cubism was created under the influence of native woodcarving), Africa again raises its mighty voice to change the face of art, and this time the face of the most characteristic art of our time—architecture.

But now the word sociological is here. I am aware what difficult domains we are penetrating. There is only few and rudimentary literature about the sociology of art. It seems that the dominating class had an interest in hiding the true reaction between art and the sociological substructure.

The genial attempt of Guyau on the sociology of art has not found followers. The socialist writers, in their tendency to practical revolution, had to neglect a domain that seemed to have merely theoretical interest. German science did not even touch this domain.

House near Paris

Le Corbusier

Sandford Orcas, Dorset

B O O K R E V I E W S

Messrs. B. T. Batsford, Ltd., have sent us another set of volumes belonging to "The British Heritage Series" and "The Pilgrims Library," all of which we can heartily recommend to our readers. Not only are they attractively printed and illustrated, which makes them a welcome addition to an architect's library, but their price brings them within the reach of everyone.

"The Legacy of England," An illustrated Survey of the Works of Man in the English Country. (price 5/– net.)

This book is a companion volume to "The Beauty of Britain," in the Pilgrims Library edition, which was reviewed in our columns some months ago, and it is equally fascinating.

From start to finish it is full of interest and gives a very good impression of every aspect of English country life.

"The Landscape" is dealt with by Edmund Blunden, and the many quotations from writers and poets, together with the fine illustrations, create a wonderful picture of England's countryside.

"The Farm," by Adrian Bell, is reviewed in all its aspects.

"The Village" is written by Charles Bradley Ford, and gives one a good impression of village life, and the inhabitants, as well as the characteristic buildings in the different counties.

"The Country House," by G. M. Young, and "The Country Church," by George A. Birmingham, are of particular interest to architects, and in the brief reviews one can trace the varying types in each district.

"The Country Town," by R. H. Mottram, gives an account of the influences which brought it about. "The Inn," by Ivor Brown, is delightful, and finally "Sport," by Bernard Darwin, puts the finishing touches to a most enjoyable and well produced volume.

"The English Country House," by Ralph Dutton, with a foreword by Osbert Sitwell. Price 7/6 net.

This volume in the British Heritage series is a valuable contribution to an architect's library.

It deals with the development of the house from the Conquest to the middle of the nineteenth century.

The book is divided up into sections, the first of which is introductory. Then we have "The English Vernacular" (1066-1550), "The Rise of the Architect" (1550-1720), "The Cult of the Antique" (1720-1850) and finally "The Garden."

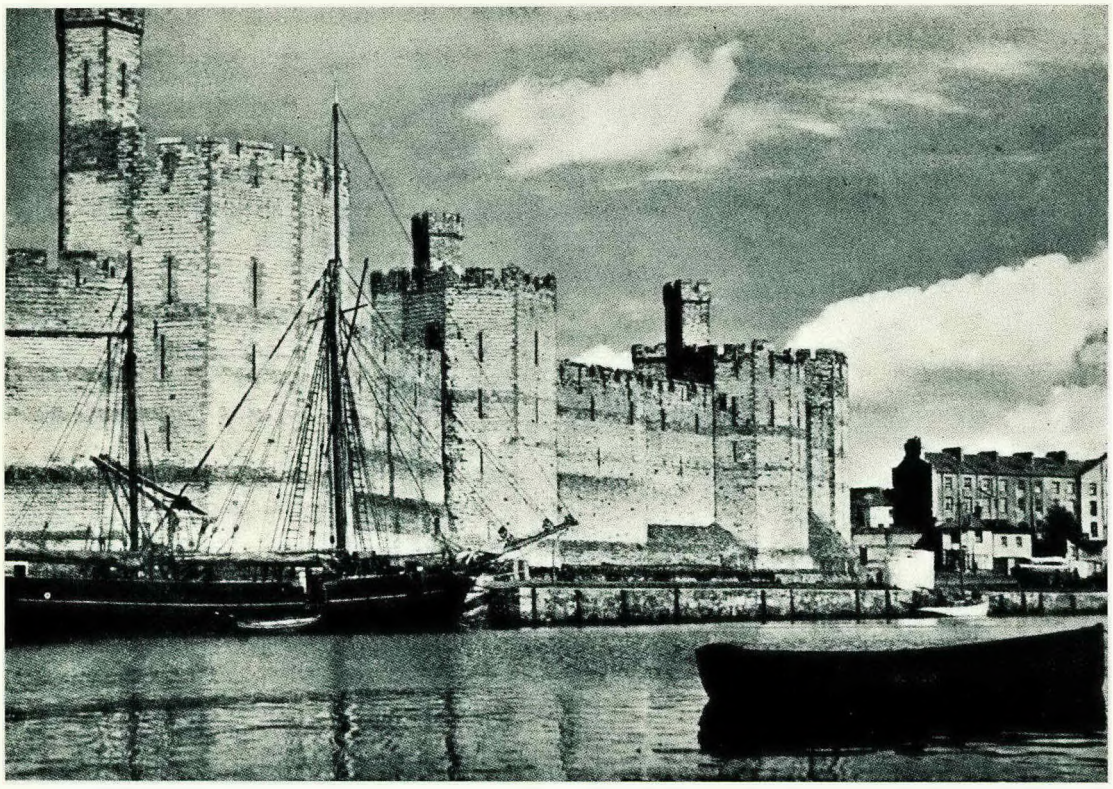
Osbert Sitwell, who writes the foreword, says: "The 'English Country House' is a delightful and informing book, full of interest, and will give pleasure to numerous readers. Mr. Ralph Dutton, indeed, is the perfect guide—no, not guide, but friend with whom to walk round all these lovely places. He unfolds for us the widest panorama, studded with houses among green trees; houses that are all different and all fascinating. For great as is his learning on this and kindred matters, he never treats country houses purely as objects, dead things left behind by previous generations, but he makes them the exquisite and appropriate shells of various manners, various methods of living: this infuses the house of which he is discoursing with a new charm."

The book is profusely illustrated with one hundred and twenty-nine superb photographic illustrations of exteriors and interiors, details, parks, gardens, etc. There are two plates in colour and numerous plans and diagrams in the text.

"The English Castle," by Hugo Braun, with a foreword by Hilaire Belloc. (7/6 net.)

In this work the author traces the development of the castle from the early earth mounds, with palisaded enclosures surrounding the timber hall, to the stately stone structures of the late Middle Ages. The story is told in a simple non-technical way, and yet one obtains a vivid impression of the construction and arrangement of these fascinating structures.

Burton Agnes, Yorkshire



Caernarvon: A detail of the mighty walls.

"The English castle," as the writer of the foreword states, "is one of the most illuminating objects of study in history. It illustrates the whole of the English Middle Ages and their military transformation under the effect of artillery. The English castle is to-day one of three things: a ruin, a restoration, or a fragment on to which has been grafted a later dwelling house unsuited to war. In its early development it followed the rule of all English things in that it came tardily and developed tardily, because the arts, military and civil, came from overseas and had been developed elsewhere before they were established here..... Towards the end of the Middle Ages all this changed. English architecture became, in castle building as in everything else, more particular and national."

The author deals in turn with castles of earth, great stone towers, lofty walls, stately strongholds and the twilight of castles.

The book is beautifully illustrated with over one hundred photographs of castles in general and in detail.

"Architectural Graphic Standards," by Charles George Ramsey and Harold Reeve Sleeper (Second Edition). London, Chapman and Hall, price 30/- net.)

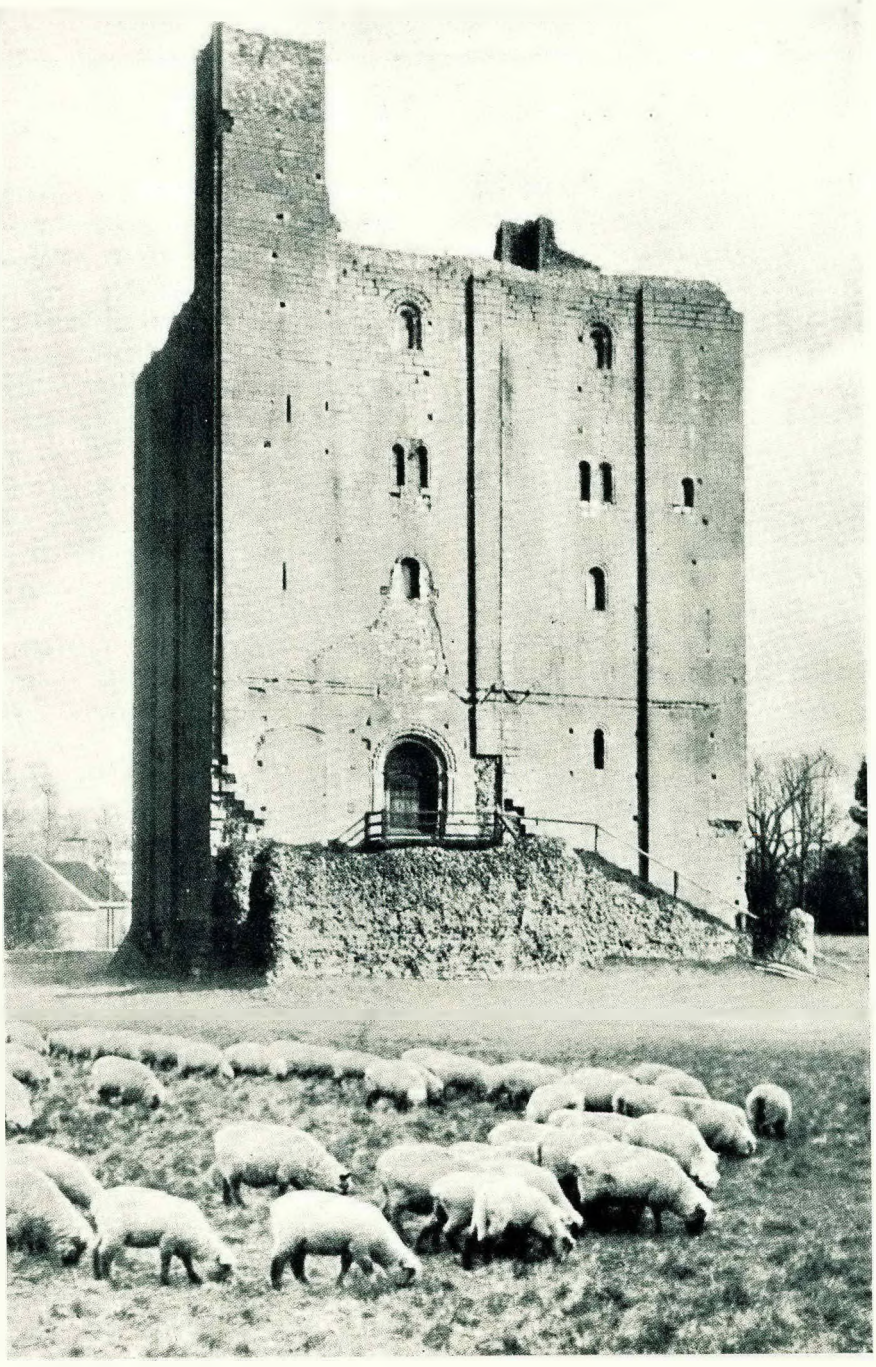
This work is an invaluable encyclopædia of desk information, and is too well known to architects to warrant a full description.

This second edition contains two hundred and sixty plates of useful information, clearly drawn, fully dimensioned and annotated. In addition to the many details of construction, there is a vast amount of data in connection with furniture, fittings, sports grounds, swimming pools, etc.

It is a serious attempt to confine within a book of reasonable dimensions the essential factual references required by the architect, draughtsman and builder in the course of the day's work.

Although the work is essentially an American publication, the diagrams, with few exceptions, apply to English and South African conditions of practice.

G.E.P.



Hedingham, Essex

STEEL IN BUILDING

An Address read by C. J. Kavanagh before the Architectural Association

There are no problems in building in which structural steelwork does not offer the ideal solution.

The advance in structural design in the last few years has been phenomenal, and it is now possible for the structural engineer to meet any specific architectural requirement with the greatest ease. The range of design starts with the simple column and beam types, extends through various triangulated forms of roof construction, either as simple girders or cantilevers, takes in its stride arch forms and, more recently, a variety of portal or frame constructions with singularly attractive aesthetic qualities. Each type, however, must be considered on its merits in relation to the individual case under review.

Type Differentiation.

In considering the relative merits of steel-frame building methods and reinforced concrete, it is not simply a question of one material versus another, for both employ steel and both are dependent upon steel for their structural functions. There is a fundamental difference between the two which goes far beyond the initial considerations of quality and cost—a difference of great significance in respect to the financial prospects of any building investment.

The difference between the two techniques is enormous. It starts with the quality of the materials used, determines radically the method of assembly, not only of the carrying structure itself, but of the vast number of component parts that go to make a building. It influences the selection of materials, their combination, and their incorporation in the finished structure.

The steel frame method represents an open and ordered assembly—a dry technique—and a wide choice of competitive materials, each selected for a particular and definite purpose in the structure. In fact, the method of assembly, important as it is in the initial building operations, is also a measure of its suitability for adaptation throughout its life, alteration, or its final demolition. When we come to regard the reinforced concrete monolithic structure, we tumble upon a constructional method which attempts to solve, by the use of one and the same material, all those varying problems relating to structural strength, weather resistance, appearance, maintenance, and insulation against heat and cold. Economic requirements such as adaptability and flexibility, together with acoustic considerations, it attempts to satisfy by continuity of structure.

Now whatever may in righteousness be accounted to reinforced concrete in its proper field of application, it cannot be argued, even by its most ardent advocate, that it can effectively satisfy such varied and complicated needs. Like most other building materials, reinforced concrete has distinct economic applications, but the wet processes involved in its technique are not without important influence on other building components, on subsequent building operations, and on the quality of the finished product. To contend that the shrinkages and workings of a plastic and porous mass from various causes are conducive to good weather resistance, or low maintenance over a period of years, is to turn a blind eye to facts and to court confusion.

Unlike steel, which is a ductile material, an inflexible monolithic system is extremely inappropriate for taking up the settlements and movements to which all buildings are subjected. From an acoustic point of view, a rigid homogeneous system which is keyed up tightly produces a series of sound boxes which, unless further expensive counter measures are employed, result in a most unpleasant structure. Steel frame construction undoubtedly lends itself much better to acoustic measures.

The monolithic reinforced construction has, not wrongly, been described as the white elephant of modern domestic architecture: it has been carried over from suitable engineering uses and applied to architecture with a complete misconception of the qualities which a habitable building should possess and with a great disregard of the principles of long-term building finance.

Evolutionary Trend.

Can there be any doubt as to the future trend of construction?

The old brick building had a great deal in its favour. Its disadvantages were that load carrying brickwork took up a great deal of habitable space, that its foundation problems were more costly, and that it was practically inadaptable to changing needs. As a system of construction—a slow vertical progression—it made for a great deal of labour on the site and was not conducive to a speedy and predetermined series of operations. It had, however, the great merit of being practically a dry technique and the materials used had been through the test of time and had produced a habitable combination. Its economic limitations, however, led to the steel frame technique which, as developed to-day, incorporates the best principles of the older method and has made possible the more easy assembly of a wide range of new materials and new constructions, each better satisfying specific requirements: it has, moreover, opened up a new horizon in planning flexibility.

Fundamental Principles.

Let us briefly consider the technique itself and its contribution to commercial architecture. A clear understanding of its fundamental principles will enable the architect to assess its many advantages. The steel frame multi-storey constructional method is characterised by a simultaneous vertical and horizontal progression of work rather than by a purely vertical one.

The steel frame is entirely self-supporting and, when used in conjunction with the new systems of floor construction, presents the lightest type of building. Excessive dead load requires heavy foundations with a corresponding larger amount of excavation together with a greater bulk and weight of material to be transported and placed in position, involving increased labour and equipment. Structural steel for the same sectional area is capable of carrying loads many times heavier than is possible with any other material and leads to an appreciable increase of rentable space.

At comparatively small cost it gives the architect a load-carrying structure which is erected to its full height in a very short time. Its stairways can be completed simultaneously with the frame, providing access everywhere. An incredibly short time elapses before large expanses of horizontal platforms, rising floor upon floor, are made available, upon which the subsequent building operations can proceed in a predetermined and logical sequence.

It is the immense working face both horizontally and vertically which is the revolutionary development behind steel, but one which has yet to be fully appreciated and properly evaluated. It represents to building what the " assembly line " represents to efficient motor-car manufacture.

The whole of the building progress is uncluttered, the system gives full and free access everywhere, from the basement to the roof; it gives the architect and the builder a perfect control of the whole complicated series of assembly operations, which constitutes modern building methods. The steel, beyond taking care in a clear and precise manner of all the loads, and transmitting them at suitable points to the foundations, is simultaneously a gauge or register for all other carrying components and even a carrying device for the hoisting and placing of materials and finished components at the right time and in the right place.

A slow vertical progression, whether of brick or reinforced concrete, is by comparison an antiquated machine. Starting with a forest of scaffolding, it interferes with the flow of materials, obscures inspection, hinders every other operation and leads to a turmoil and confusion of trades—all of which retard sound and economic construction. It is a hedged-in series of operations attempting to manufacture a building on the spot rather than a systematic and precise work of assembly. It represents to me a witches' cauldron with the incantation of the architect " 1, 2, 4 " and of the builder " 1, 3, 6 "!

It is important, moreover, to note that the vertical construction process is gradually but surely being displaced by the trend of architectural design. The enclosure elements of brick or concrete are now considerably diminished and, in some building types, absolutely superseded by the large areas of metal and glass in windows and stair enclosures.

To be continued.