

REVIEWS.

EGYPTIAN ARCHITECTURE.

L'Art de bâtir chez les Egyptiens. Par Auguste Choisy. Sm. fo. Paris. 1904. Price 20 francs. [Edouard Rouveyre, 76, Rue de Seine, Paris.]

When in 1866 I was measuring the theatre of Bacchus at Athens, which at that time had not long been discovered, I found another "chiel takin' notes," with whom I entered into conversation in the course of the afternoon and again on the following day. A few years ago I chanced to refer to the hasty and illegible diary which I kept during my tour, and found the following entry: "Made the acquaintance at the French Academy of an engineer of the Ecole des Ponts et Chaussées, a young man of 23 or 24, remarkably intelligent, and full of theories on all possible points connected with the buildings in the Acropolis, &c. He has, I believe, already written many essays about them which have received the approval of the Institute of France." That young man was Monsieur Auguste Choisy, the distinguished French author, whose works on *L'Art de bâtir chez les Romains* and *L'Art de bâtir chez les Byzantins* have become household words amongst our students in late years.

Among other works, M. Choisy published in 1899 a *History of Architecture*, in two volumes, which is less known, possibly on account of the large number of technical terms in it. In the preparation for this work, which included Egyptian architecture, M. Choisy set forth his views as regards the construction of the Pyramids and Temples, and explained in detail the method of building arches in crude brick without centres, which had already been divined some 12 or 14 years ago. In the new work just published, *L'Art de bâtir chez les Egyptiens*, M. Choisy has returned to the subject, and brought forward a large amount of new material, with minute observations on the various methods adopted by the Egyptians, both in the construction of their stone temples and of their made brick walls and storehouses. In addition to over 100 copper-plate engravings introduced in the text, M. Choisy has added 48 photographs which are of great value, not only because they confirm the views set forth by the author, but as representing subjects and points of view which the amateur or professional photographer would have deemed unworthy of the camera. From M. Choisy's point of view unfinished portions of building and faulty construction are of much greater value to him as exceptions to the rule by which he proves his theories to be well founded.

M. Choisy generally manages to condense into a single page that to which most writers would devote a whole chapter, the result being that in about 180 pages of text, with an average of

20 lines to the page, he has compressed an amount of matter on which many volumes might have been written.

The two most important discoveries in this volume are, first, the reasons why in certain great walls of crude brick at Abydos and Karnak, the courses, instead of being horizontal, are laid in undulating or wavy beds; and, secondly, the machines and the methods adopted by the Egyptian masons to raise their stones into position.

As regards the first, the undulating courses have hitherto been ascribed either to settlement of foundation or to an attempt to prevent destruction by earthquakes; but M. Choisy points out that in some cases they are built upon rock, where no settlement would take place, and earthquakes very rarely occur in Egypt. Having noticed that the walls built in wavy courses were invariably near the Nile or some inland lake, whereas high up or in the desert the courses were horizontal, M. Choisy came to the conclusion that the precautions taken by the Egyptians were deemed necessary because, with water in proximity, the moisture from below was drawn up into the brickwork by the heat of the sun in the daytime, and at night this moisture condensed and the crude bricks increased in bulk. If the walls were built on a slope, the lower surfaces being moist there was a tendency to slip, and in any case the swelling of the bricks might cause cracks. To obviate these dangers, if a concave bed were given to portions of the wall it would prevent slipping, and by leaving at intervals open vertical joints, these joints were closed up by the hygrometric changes in the brick.

In order to raise the blocks of stone M. Choisy gives, amongst others, examples of two levers—(A) a series of levers side by side with a heavy counterpoise; and (B) an assemblage of timber which he calls *l'ascenseur oscillant* (oscillating cradle). This machine (of which he says there are twenty-one examples in the Louvre) is represented in the British Museum by a small model only, which was found in a tomb. This model has always been assumed to be one of a centre on which arches were built; but, as M. Choisy has proved that all their vaults were built without centering of any kind, it must have served some other purpose. The cradle consists of two beams of timber, of segmental shape, about 6 feet long, framed together at a distance of about 2·6 with stout wooden bars. On the top of the oscillating cradle, the stone, measuring about four feet square by 2·6 high, was shifted by means of an inclined plane, and then, by means of levers and two or three blocks of stone, introduced one after the other under the cradle, the stone was raised and shifted on to the upper bed, the limit of height of the same being about 5 feet. This is the height established in the Great Pyramid, and the cradle is the inter-

pretation which M. Choisy puts on the description given by Herodotus, who says that the machine for raising the stones from one level to another was made of small pieces of wood. As Herodotus's description was given to him by the priests, it is the principle rather than the exact form taken by the machine on which, as M. Choisy suggests, we have to rely. On the other hand, the model in the British Museum is probably from 2,000 to 1,500 years later than the Great Pyramid, so that the methods employed in raising the blocks in the latter continued in use up to and probably including the Roman domination.

Up to the present day it has always been assumed that inclined planes formed the only scaffolding employed by the Egyptians; but M. Choisy points out that at Karnak, where the temples are planted so close one to the other, there would be no room for the immense extension of these inclined planes. He suggests, therefore, as an alternative, the temporary erection of a series of step-platforms similar to those which formed the actual kernel of the Great Pyramid, and he brings forward, in corroboration of his theory, photographs representing the remains of the temporary platform which was erected in the great court of Karnak in order to build the Pylon and the adjoining colonnade. These remains have usually been regarded as works of late date when those courts were taken possession of by squatters who settled in the precincts of the temple; but M. Choisy gives a photograph of one, and of the colonnade which adjoins the Pylon, and here one notes that the capitals of the columns still remain *en bloc*, and have never been worked down to their proper shape (*ravalés*). For some unknown reason the work was stopped and the colonnade was left unfinished. It is by minute observations of this kind that M. Choisy has been able to reveal to us the methods of construction employed by the Egyptians from the earliest times, and those to which we have drawn attention form a small portion only of his great treatise.

In the last pages of his work M. Choisy summarises the methods employed by other nations. Thus the prehistoric people who erected the menhirs and dolmens in various parts of England and at Carnac in Brittany worked according to the Egyptian method, as also the Phœnicians at Baalbec; and, following the sculptural representations in their bas-reliefs, the Assyrians.

The descriptions given in Vitruvius (x. 6) and Pliny (xxxvi. 21) suggest, according to M. Choisy, that the methods of construction in the Temple of Ephesus were only partially Egyptian, and at Selinus in Sicily he says nothing exists of Egyptian precedent.

The beauty and simplicity of M. Choisy's illustrative diagrams in the text have already been appreciated in his other works, but his photographic

reproductions are new and will be of inestimable value, not only as supporting his theories, but as records of Egyptian construction, most of which in course of time may possibly disappear.

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SHROPSHIRE CHURCHES.

An Architectural Account of the Churches of Shropshire. By the Rev. D. H. S. Cranage. Illustrated with Photographs by Martin J. Harding; and with Ground Plans of the most important Churches by W. Arthur Webb [A.]. Part 6. [Hobson & Co., Wellington, Shropshire, 1903.]

Mr. Cranage is nearing the completion of his monumental account of the churches of Shropshire, a work which leaves very little for any future architectural historian to add to. Everything noticeable about each church appears to be noticed, and all doubtful points of interest are discussed at adequate length. The descriptions of the buildings are full without becoming prosy, and instructive without being dogmatic. Mr. Cranage is not satisfied with merely recording the features and history of the subjects of his inquiry; he studies them also from the artistic point of view. He considers with a highly cultivated sense of discrimination what is worthy of being admired or the reverse in the work of every age. His open-mindedness and independence of fashionable prejudices are refreshing. The work of no one century is all sacred to him, nor that of another all accursed. The author shows a most happy temper in being able to speak even of things done in the nineteenth century without the incessant bitter railing which gives such an unpleasant as well as monotonous flavour to so much of our recent architectural literature. He has eyes ready to appreciate good work of every age; and, even when justice obliges him to blame results of uninstructed zeal, he is never uncharitable, but always willing to recognise that even what we most disapprove of now was done by men very like ourselves, doing their best according to their own lights.

The "plum" of the present volume is the very interesting church of Acton Burnell, attributed to Bishop Burnell, the great Minister of King Edward I., whose work at Wells is so well known. Among many others the churches of Conover, Alberbury, and the curious little Jacobean chapel at Langley may be mentioned. Everyone interested in the perennial question of the "low side window" should look up the drawings and description of what Mr. Cranage truly calls the very remarkable window of this kind at Church Preen. Mr. Webb's plans and details and the photographic views continue up to the standard of the former parts.

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