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Excerpt

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TREATISE

ON

ARCHITECTURE.

NOTE.—References are frequently made throughout the book to subjects such as Timber, Harbour, Bridge, &c.; these references are to Articles in the *Encyclopædia Britannica*, Eighth Edition.

History.
Architecture, what it is.

ARCHITECTURE (Greek, *δοκοδομική ἀρχιτεκτονία*; Lat., *architectura*; Ital., *architettura*), the art of building with convenience, strength, and economy, and also with beauty. It is this last quality which forms the important difference between the art of architecture, the science of construction, and the business of the builder. The term is derived from the name given to its professors by the Greeks, *ἀρχιτέκτων*, head or chief of the builders. The word *τέκτων* is probably derived from *τέχνη*, and signified a builder as far back as the time of Homer, who (*Iliad*, Z, 315) says they are “men who make the bedchamber, the house, and the hall.” In *Ib.* O, 411, and *Odyssey*, I, 125, the term is applied to a shipbuilder. Herodotus appears to be the first who uses the phrase *ἀρχιτέκτων* (*Thalia* 60), where it is given to the engineer of the great tunnel at Samos; in the other instance (*Melpomene*, 87) to the architect of the bridge across the Bosphorus. The Romans sometimes used the word *architecton* (*Plautus, Pænulus* 5, 2, 125), but more generally *architectus*—the word being supposed to have an analogy to *tectum*, the roof of the house.

Architecture, branches of.
Civil architecture

Architecture is generally divided into three distinct branches—military, naval, and civil. It is this last branch alone of which we propose to treat in this place.

Civil architecture teaches to design all buildings, ecclesiastical, palatial, monumental, public, or domestic. The first considerations, of course, are utility, convenience, soundness, and economy; and no beauty of form or decoration can excuse the want of these primary qualifications. But

as the minds of almost all men have delight in stately or graceful forms and elegant combinations, the great element of beauty, or that which is pleasing to the eye, is the next consideration.

History.

The investigation of the qualifications of a good architect will best exhibit the requirements of good architecture. These have been the same ever since the days of Vitruvius, who tells us that the architect should be a man both of theory and practice; that without study and literary acquirements he will be at fault in all matters which require the weight of authority; while, should he rely on this last without sound practical knowledge, he “seeks a shadow and not a substance.”¹ He says the architect should be of a literary turn of mind, a skilled draftsman, thoroughly learned in geometry, and not ignorant of optics (perspective), a good arithmetician and accountant; that he should know much of history, and should have attended lectures on natural philosophy; that he should understand as much of music as teaches acoustics, be not ignorant of medicine (chemistry and sanitary matters), and should know as much of law and of astronomy as applies to his own profession. “I do not mean,” Vitruvius says further on, “that an architect should be a philosopher of the highest rank, nor a most eloquent orator, nor a man excelling in the highest branches of literature;” but he goes on to insist that the true architect, besides the absolutely necessary artistic and mathematical acquirements, should be imbued with learning (*litteris imbutus*). Just as it is in the present day,

Architect, qualifications of.

¹ “Qui autem ratiocinationibus et literis solis confisi fuerunt umbram, non rem persecuti videntur.”

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History. the true architect must possess a combination of the qualities of the scholar, the artist, the mathematician, and thorough man of business—qualities the most opposite in their character, not often seen singly, and most rarely to be all found combined in the same individual. However, such is the state of the case, and such is the true reason why in all ages there have been so few architects of the very first rank.

Vitruvius' divisions of. It is to be regretted that the only author of classic antiquity on the subject of architecture whose works have come down to us is Marcus Vitruvius Pollio. His ten books on the subject are of the highest curiosity and value. Unfortunately, as he himself hints, he was more of the architect than the author. His style is crude and somewhat confused, his technology very difficult to understand, and his definitions sometimes perplex instead of elucidating the subject. Nevertheless, a careful and painstaking perusal of his works show a strong common sense, a love of beauty, a great propriety of taste, and principles which are equally true in every style of architecture. The number¹ and beauty of the MSS. of this author which are extant show the popularity he must have had in the Middle Ages. Indeed his enumeration of the requisites of a good building, *Firmitas, Utilitas, Venustas*—Stability, Utility, Beauty—is as much that of the mediæval as of the classic architect.

Construction. Of the first of these qualities, firmness and stability, we shall here treat only as regards the bearing such qualities may have in design and effect. The details of stability will be found in the various heads—BUILDING, CONSTRUCTION, CARPENTRY, JOINERY, ROOF, STONE-MASONRY, STRENGTH OF MATERIALS, &c. &c. The others will be treated of as they arise.

It is now proposed to follow our author in his definition of the different branches of his art, and to comment on the same as we go on; first, because he treats so copiously on the matter, and next on account of the interest arising as to his works since the commencement of the Dictionary of the Architectural Publication Society. It has been his misfortune to be over praised sometime ago, and unreasonably neglected lately, and in both cases to have been misunderstood. The dictionary alluded to, and the noble edition of Stratico (4to, Utini, 1826), have, however, thrown much light on the work, and shown how much more valuable it is than has been supposed.

Parts of the Art. Ordination. Vitruvius begins (lib. i. cap. 2) by stating that architecture consists of *ordination*, which the Greeks call *τάξις*; of *disposition*, which they call *διάθεσις*; of *eurythmy*; of *symmetry*; of *propriety* (decor.); and of *distribution*, which the Greeks call *δικονομία*, or stewardship. Commentators have been much puzzled to give a correct explanation of *ordination*, but as we are not now editing this author, we shall not enter on the question. The general scope, however, may be shortly stated thus—the first thing to be done is a general consideration of the convenience of the design (*commoditas*), a comparison of the parts, an idea of the size (*ποσότης*) and dimension, and of the style and general effect of the whole.²

History. Vitruvius, then, defines *disposition* as the getting the work into form, or, as we should say, “upon paper.” He subdivides this head into three parts—*Ichnography*, or plan; *Orthography*, or geometrical elevation; *Scenography*, or perspective views, showing the flanks as well as the front. These are to be carried out, he says, by two faculties of the mind,—thought and invention,—by which beauty is arrived at and difficulties overcome.

He then tells us to consider the *eurythmy*, or the general large proportions of height to width and width to length of the members of the composition. In other words, the architect should next study the *masses* of his design. Next comes *symmetry*, or the proportions of the details; as the human body has certain symmetrical proportions, the forearm, the foot, hand, finger, &c., so should the columns, antæ, and other parts of a building also have definite proportions each to the other.

But to effect this well, our author says we must study **Propriety.** *propriety* (decor.), and this he divides into three parts—*θεματισμός*, or site; *custom* (conventionality); and *nature*. Thus, he says, temples to Jove, the Sun, Moon, &c., should be hypæthral, open to the air (*sub dio*); to Minerva, Mars, Hercules, &c., they should be Doric; to Venus, Flora, Proserpine, &c., they should be Corinthian, as more graceful and florid; while to Juno, Diana, Bacchus, &c., they should be Ionic, as a style between the severe Doric and the slender Corinthian. He instances, as a want of propriety, elegant interiors with low and shabby entrances; and, as a solecism against established rules, dentils in Doric and triglyphs in Ionic entablatures. He then treats of propriety, as regards site and aspect, which he calls natural propriety, first as regards the selection of a healthy spot, and one having good air and water; and then tells us, among many other matters, that the cubacula and libraries should face the east; baths and winter rooms the west; and that picture galleries should have a north light, &c. &c.

We then come to the division, *Distributio* or economy; **Economy.** and this consists of two branches,—the making the most of the site, and such a saving of funds as is consistent with moderation.³ “If you cannot get pozzolano except at great price,” he says, “you may use river-sand or well-washed sea-sand. If fir or pine is scarce, use cypress, poplar, &c.; and, last of all, build according to the wealth, dignity, and power of your employer.” Then, with a further injunction to regard stability, utility, and beauty, Vitruvius goes on with the details of his art.

What principles of architecture can be more sound, real, True principles, and true, we are at a loss to know. The architect is first to find out what the requirements of his employer may be, then to get them roughly together; then to set out his plan, study his elevation, and set up a rough perspective. From this he is to proportion his masses, and then study his detail and ornament; all the while to be governed by a sense of general propriety, a deference to religious opinion and the conventionalities of society, and to spare his employer's purse as much as he can, consistently with making the building worthy of his position in society. This seems exactly the mode pursued by Sir Christopher Wren, if we may judge from his drawings preserved at All Soul's College and elsewhere, and is equally applicable to every style of architecture. It is true, in the present day, there are some who try to produce effects by lavish expenditure, especially in ecclesiastical buildings; but our common sense must

The Utini editor cites 20 MSS., without including those in the British Museum and in the Library of the Royal Institute of British Architects.

² “Universi operis conveniens effectus.”

³ “Locique commoda dispensatio, paræque in operibus sumptus cum ratione temperatio.”

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3

History.

Decorate
construction.

tell us that one of the chief virtues of an architect is the economy so strictly enjoined by Vitruvius.

We find, also, that our author held the principle of designing the masses or general construction, and then adding such ornament as might be fitting to the object, use, and expense of the different buildings. It has been lately supposed that this true principle, "decorate your construction," is peculiar to mediæval architecture alone. But this is not so. The ancients having settled their general proportions, proceeded to add such decoration as propriety seemed to dictate. Mouldings were increased in number, and covered with the echinus or other ornament; friezes and architraves were sculptured with rich foliage and figures; capitals and bases enriched; columns fluted instead of being left plain; soffits sunk and coffered; in short, the decoration of the classic architect had as little to do with the broad masses of the construction as that of the mediæval architect. The Doric of the theatre of Marcellus has very much the same proportionate parts as those of the same order in the baths of Diocletian; the Corinthian of the Pantheon is very similar in mass to what is generally called the Jupiter Stator or those in the Forum of Nerva. The same blocks of marble would have constructed the same orders (of course if on the same scale); but the difference is in the enrichments—the labour of carving in the one is threefold that in the other. The construction is the same, but the decoration has been carried much further. The former are plain and simple; the latter, being intended for more luxurious purposes, are naturally much richer.

Utility
without
beauty.

Let us now consider a mere utilitarian building, where there is no pretension to design. Take the majority of the houses about Bloomsbury and Marylebone. They are roomy, commodious structures, fitted with every convenience for families of the highest respectability. Yet, externally, they have been very truly described as "brick walls with rectangular holes in them." If, instead of a plain, flat coping at the top, we add a handsome cornice; if we put a well-proportioned dressing round each window, with consoles to carry the cills, and rich string courses, or balconies with ornamented balustrades; if we build a handsome portico to the door: if we invest the house with all these architectural features, the tenants will enjoy the interior just as before; they will not eat more, nor sleep sounder; but they will feel a greater pleasure and pride in their dwelling every time they or their friends go in or out; and the house itself will fetch a higher rent. All this results from the pleasure which elevated minds take in works of art, and the appreciation they have of thought, care, and mental ingenuity.

Beauty
without
utility.

But to affect beauty without utility is the gravest of all mistakes. Houses are made to reside in, for our comfort, our solace, our repose. If the internal arrangements are not suited to all these things, the house, which at first was our pride, becomes at last intolerable, and we are compelled to seek in some plain unpretending abode the qualifications that tasteful decoration will not afford us. When the Earl of Burlington designed the house for General Wade, the front and all the internal decoration was of great beauty; but the rooms were all passage rooms, the staircase being in one corner, and there was not one apartment in the house fitted for its particular domestic use. The wits advised him to take a house opposite, that he might look across and admire the beauty of his own, while he enjoyed the comfort of the latter; and there was much truth and common sense in their advice.

Beauty of
design.

Let us now inquire into the principles of designing with beauty. By this is meant designing so as to please the eye and taste; for buildings may be of rude material and form, and yet may please by their size and propriety. Thus, the

jail at Newgate is generally admired, particularly the corner facing Giltspur Street. It is simple, massive, imposing, and tells its own tale. It is a great prison, a building intended by its rugged appearance to deter from crime. So that in speaking of beauty we include those buildings which please from their grandeur, just as in poetry the sublime delights us as well as the beautiful. The chief elements which lead to these feelings of pleasure may be ranked as follows.

History.

The size of a building has much to do with the pleasure we derive from its contemplation. Pyramids have all the same general form, but those of Egypt astonish and delight us by their vastness. Obelisks have much the same proportion, but we are more pleased with the vast monoliths at Rome than with smaller erections of exactly the same proportion. The great temples in Sicily and the Parthenon please from their size as well as their design; and the temple at Tivoli pleases more than the choragic monument of Lysicrates. The trilithons at Stonehenge, and the cromlech at Aylesford please from their vastness, while the very same forms on a small scale would be unnoticed. The plain, simple early cathedrals in Normandy please more than the smaller and richer churches of a later period. In fact, size, no doubt, is a great element in exciting our admiration. Grandeur can hardly be said to exist without it.

In the same way, the size of the material used has much to do with the effect in some styles of architecture. Large buildings look all the better if the stones are in large blocks, particularly in the level architraves of the Egyptians and Romans. Thus our Lord's disciples (St Mark xiii. 1) admired the vastness of the stones in the Temple at Jerusalem; and the historian of Peterboro', Hugo Candidus, records with much satisfaction the "lapides immanissimos" with which the old cathedral was built. Marble looks better than stone, and stone than brick, in all classic work. But the Gothic architects, whose methods of transport were very imperfect, and who were compelled to cut large stones into small pieces in the quarry for the convenience of carriage, boldly proceeded in a contrary path, and gave artificial grandeur to their buildings by the small size of their component parts. Much of this source of pleasure depends on our next element, costliness.

This also, though not invariably so, is another element which gives us pleasure. Apart from the beauty of colour in marble, comes the consideration of the distance from which it has been brought, and its corresponding price. In contemplating polished granite, we consider the vast labour and expense of reducing so hard a material. We respect the motives which led the founder to what must have been a sacrifice on his part to exalt his object; and we feel also that he meant to please us, the spectators, and are gratified to have beheld such rareties and riches of art as are not to be seen every day, and we feel a sort of reflected pride in the remembrance.

But costliness must be tastefully expended, or it becomes unpleasant. A plain garment which fits well is much more becoming than ill shaped cloth of gold. When we behold lavish expenditure badly carried out, we say, "What a pity it is this rich man had not gone a step further, and paid somebody to find him a little taste." Besides this, it often then assumes the character of ostentation, and nothing is more offensive than this in architecture, as in other matters.

Leaving, now, the consideration of size and cost, the first thing no doubt to study is the general disposition of the masses of the composition. Perhaps the best way would be to look at the building at such a distance that the mind may not be disturbed by the contemplation of the details, or to study it by moonlight. Thus, the mass of a Gothic cathedral, the proportion of its parts, the outline of tower,

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- History.** nave, choir, and lady chapel, the deep shadows which show the projection or recess of its various parts—all form one great element of beauty, when there is not light enough to distinguish mouldings, or carvings, or tracery.
- Stability.** In an analogous way, we are pleased by the appearance of stability in a building. A feeling of security always gives satisfaction; and to an educated mind the proper disposition of parts, as openings over openings, sufficient support to superincumbent weights, and adequate abutment to arches, all contribute to please. While large weights on slight shafts, huge ponderous pendants in groined roofs, artifices to conceal the means of support, all tend to excite feelings of distrust and dissatisfaction.
- On the other hand, the eye is oppressed by heaviness in a design. Any undue waste of material, any unnecessary weights or thicknesses, displease in buildings where such massiveness or heaviness is not an inherent feature. The massive forms and rude rustics of Newgate would be quite out of character in a palace, theatre, or even in private houses.
- Another error into which an architect may fall is a want of repose in his composition. Few things are more displeasing in a building than an appearance of flutter, confusion of parts, projections without purpose, ornaments obtruding themselves on our notice, a want of rest and balance,—all this should be avoided if we would please the spectator.
- Harmony.** There should also be a harmony throughout the design. Parts should balance each other. Those supported should have an adequate ratio to their supports, and so should it be with the solids and voids. If there be columns in one story those in the next may be lighter, but should still retain a definite proportion. If too large they dwarf the lower story, if too small they become poor and petty. So in gothic buildings the clere-stories should neither be too large nor too small for the arcades; nor the aisles too wide or too narrow in relation to the nave.
- Proportion of.** This brings us to the most material of all considerations, the proportion of masses. Every one, even the most uneducated, will be struck on entering a building if it be too low, or unreasonably high. A gallery for pictures, or a corridor, may be as long as one pleases without offence to the eye, because length is necessary to its use; but an apartment for any useful purpose should not be too long for its width, nor too high or low for either. There is no doubt that a system of proportion of dimensions, based on mathematical ratios, gives pleasure. An exact cube; a double cube, or two cubes placed side by side; the ratios of aliquot parts each as 1 to $1\frac{1}{2}$,—as 20 feet high, 30 feet wide, and 45 feet long; or those of the base perpendicular and hypotenuse of a right-angled triangle, 3, 4, and 5, or their multiples, please the eye more than dimensions taken at random. Besides this, they are clearly better for hearing; but this is treated of under the head **ACOUSTICS**.
- Symmetry.** The only remaining branch of the treatment of masses is that of symmetry or uniformity. The unreasonable straining after uniformity by architects of the past age, the sham doors and windows, and the unnatural contrivances to make everything balance, has driven people into a corresponding error in the present day. Many architects now go out of their way to make things irregular and unsymmetrical. Now this is a grave mistake, and, like the former error, arises entirely from the bigotted attachment to the study of one style to the exclusion of that of every other. This betrays men to the belief, that the true principles of architecture are to be found in one style only, and that the only way to arrive at truth is to be ignorant of half your profession. Some years back the architects thought the essence of classicality to be tameness, coldness, and sameness. To avoid these errors the mediæ-
- valists ran into the opposite extreme. It is because both have studied under limited views. The truth is, the ancients placed their buildings irregularly where it was reasonable to do so. The Propylæa at Athens, with the Temple of Victory, was of irregular composition. The Erectheum comprised three several buildings, each differing most materially in design, and each disposed as was most fitting, without any regard to the uniformity of the entire mass. The old Forum at Rome was a collection of buildings, temples, basilicas, atria, triumphal arches, each differing in style, character, and taste. That at Pompeii was the same. Just so it was with the mediæval buildings. The abbey had its church, chapter-house, cloister, dormitory, refectory, guestern-house, abbot's and prior's chambers, all distinct buildings, and all grouped together. But it is utterly forgotten by the advocates for irregularity that each building was symmetrical in itself; that is to say, if a line were drawn down the middle of each one side would correspond with the other, just as in the case with a leaf, an animal, or with the human figure and face. While such instances of symmetry abound in nature; while irregularities, a nose askew, a mouth on one side, one eye, or one shoulder higher than another, are accounted deformities, in spite of the dictum of any sect, one great element of beauty will be found in symmetry. This, however, must not be set above utility or convenience. The best possible dictum on the subject is that of the great Lord Bacon, who says: "Houses are built to live in, and not to look on; therefore let use be preferred before uniformity, except where both may be had."
- Another source of pleasure to the eye is the judicious introduction of colour. In all ages this has been freely used in interiors. In Jeremiah xxii. 14, we read of buildings "ceiled with cedar and painted with vermilion;" and the temples of the Egyptians are richly decorated with colour. As long as Nature decks her landscapes with varied tints, as long as flowers and birds are covered with bright hues, so long will colour please in architecture.
- It is clearly so in interiors, but it has been doubted whether external colouring is desirable. Some contend for local colour only, that is, the colour of the material. Thus, Mr Ferguson advocates the use of red brick against a green wood. Mr Repton, on the contrary, says, "A red brick house puts a landscape in a fever;" and demands that such houses should always be white, and gives diagrams, with overlays, to show the advantage of the latter. Others contend that the colour of the material itself should be varied in every possible way. Thus, some short time ago every building had horizontal bands, or stripes of colour on it, without any reason suggested by the construction. This fashion was then carried further, and brickwork was spotted over red, yellow, and black, in patterns so unartistic as to appear childish and *petite*. The former received the name of the "streaky bacon," or "holy zebra" style; the latter has not unaptly been called the "Tunbridge-ware style." The truth is, that form should always be the first consideration. Colour is but the handmaid of form. Like the graphic art, correct drawing will please in monochrome, while no colour can compensate for bad drawing. Still this is no reason why both may not be used, if employed with discretion.
- Next to general beauty or grandeur of form, the eye derives most pleasure from ornament in architectural work. Except in such cases where vases, or other similar ornaments or statues are placed on bases or pedestals, and used partly to make a sort of finish to the work, partly to break the sameness of long lines, and partly to show the elegance of the objects themselves, as we place works of art on our

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History. chimney shelves, with these exceptions all ornament should be the decoration of constructive parts of the fabric. Ornament put up without meaning always provokes the remark, "What is this stuck up for?" Or like the dialogue Canova supposed to have been held between himself and the screen of columns at old Carlton House,—

"Care colonne che fate quà?
Non sappiamo in verita!"

Ornament. Ornament, no doubt, was originally derived from improvements upon, or finishings to the various parts of construction. The capital of a column has justly been supposed to be derived from the tile placed at the top of the trunk of the tree, or the upright prop which carried the architrave to keep the wet from running down the grain; while the necking is supposed to represent a ring put round to prevent the tree from splitting. In the like manner the triglyphs are supposed to have been channels cut in the ends of the beams carrying the ceilings, and which rest on cross beams which form the architraves. From a passage in the *Odyssey*, A. 128, the flutes in the columns are supposed to have been intended as places in which to rest the points of the spears; for Telemachus, on entering the house, goes up to a column and places his against it. Unless there were some channel to catch the point the weapon must have fallen down. The skulls of oxen, carved in the metopes of classic temples, were no doubt originally the actual skulls of the beasts which had been sacrificed, nailed up as memorials, and afterwards perpetuated in stone. Just so the festoons of wreaths of real leaves and flowers, which to this day are hung up before the fronts of churches abroad on great days, became fitting objects for the carver's skill in later times.

Mouldings. Ornament may be divided into two classes—mouldings and the sculptured representation of natural or fancied objects. Mouldings, no doubt, were derived, first, from the simply taking off the edge of anything that might be in the way, as the edge of a square post, then sinking the chamfer in hollows or various forms, and thence was derived the systems of mouldings we now find in all styles and periods. Each has its own system; and so well are these known, and so clearly is the difference understood, that a skilful architect will tell, not only the period in which any building has been erected, but will even give an idea of its probable size, as the professors of physiology will construct the animal from the examination of a single bone. In fact, mouldings are the comparative anatomy of architectural styles. Of course, like everything else in architecture, their use may be over-done; and, on the other hand, their absence or paucity betokens a poverty which is very unpleasing. They should, however, always be carefully studied. Nothing offends an educated eye like a confusion of mouldings. Roman circular forms in Greek work, or early English in that of the Tudor period, all are disagreeable, not only to the professor, but also to the ordinary spectator. He cannot tell you exactly why, but he feels there is something wrong, something incongruous, and is disappointed accordingly.

Sculptured ornament. The same remarks also apply to sculptured ornaments. They should not be too numerous nor too few, and, above all, they should be consistent. The carved ox skulls, which are appropriate in the temple of Vesta at Tivoli, or that of Fortuna Virilis at Rome, would be very incongruous on a Christian church; while saints and angels would appear out of place on an arsenal gateway. No rules can be laid down further than general hints what to avoid; the rest must be left to the common sense and good taste of the student. It may be well, however, to say, that ornament should always be architectural in character. That style of carving which indulges in prominent projections, extravagant scrolls, and grotesque work, is very properly called "plate-

resque," or silversmith's work, by the Spaniards, because it resembles the magnified designs for jugs, tankards, &c. We must also remember, that when a building is covered with ornament of this kind, it loses all its architectural effect; the architect, in truth, does but make, as it were, a frame for the artist to exhibit his work in.

A third sort of ornament is a mixture of the moulding and the carved work, and is commonly called enriched mouldings. Of these, the most usual are the egg and tongue (plate 8, *ovolo*), leaf and tongue (ib. *cyma reversa*), and the reel and bead (ib. *bead*). These are to a great degree conventional. The enrichments in the Gothic mouldings (Plates XXXIII. *et seq.*) are partly imitative of natural objects, as cords, &c., and partly heraldic. Mediæval mouldings are very varied in character, and show great fancy and love of beauty. Having traced the main divisions of the art, and the qualifications necessary to the architect, we proceed now to treat of its origin.

Origin of Architecture.

The necessity for obtaining frequent shelter from the great heat, or from the inclemency of the climate, no doubt first suggested the piling up materials in some form to effect this purpose. Shelter was perhaps readily found in some wood, and in rocky countries in some cavern; but as it was necessary, particularly for pastoral tribes, to inhabit plains where there were neither groves nor caves, that which at first was a protection afforded by nature was imitated by a sort of rude art. Branches of trees were no doubt carried into the open country, and there piled up, so that the shepherd might creep under and find shelter from the sun's heat or the chilling storm. On the wild moors, where there are no trees, and where the ground is covered with scattered fragments of rock, the remembrance of the natural caverns no doubt suggested the piling up stones in such form as to be a protection against the elements, just as shepherds do in the present day; and thus, as a distinguished writer has said, "the wigwam became a hut, and the hut a house." Where trees abounded, stone probably was the last material used, as it would entail so much more labour than timber; but of course it was soon found stone had two great advantages—it would neither burn nor rot; so that it soon had the preference for all durable purposes. Where there were many trees, as in Greece and in Lycia, the stone architecture exhibits traces of the original timber construction. As has already been said, the columns were originally posts, and the architraves and triglyphs beams resting on each other. The famous Lycian tomb in the British Museum is also a strong proof that the art of the carpenter there preceded that of the mason, and suggested forms which became conventional, and from which the latter could not venture to depart. On the contrary, in the plains of Egypt, where building timber is scarce, and where there is abundance of large stone in the mountains, the *mason* element seems to prevail. In such plains as those on which Nineveh and Babylon stood, a factitious stone was made, first by lumps of dried, and then, advancing a step, of burnt clay. In the vast sandy deserts, where there are neither trees nor stones, the skins of beasts, sewed together and supported by sticks, was the earliest shelter. This soon grew into the tent, and its form still influences the architecture of the Chinese and Tartars. There has been much time expended on endeavours to prove which of the two materials, timber or stone, first gave birth to the art of architecture; the truth probably is, that the hut, the cairn, and the tent, all contributed their share in their respective countries.

Monumental Architecture must have originated in a desire to commemorate important events, such as the death of great men; hence we may suppose that the first considera-

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tion would be to make such memorial as durable as possible, and this circumstance would lead to the use of stone instead of wood. The piling a few stones on each other to form altars can scarcely be called anything more than preparing a place for fire. Probably the first act which might be called the erection of anything designed to be a lasting memorial, would be the setting up a large stone or pillar as a memorial of any event. In the earliest records of the Scriptures this is frequent. Jacob sets up a stone as a memorial of his agreement with Laban; Joshua, after the covenant, by Shechem; and Samuel, after the battle with the Philistines, at Mizpeh. And though it has lately been pretty clearly proved, that what have been commonly called cromlechs, that is, three or four stones placed on each other like a small chamber or hut, are really sepulchres which have been covered with earth, and are not temples; yet it is clear that such constructions of stone as the circles at Avebury, those in Brittany, and particularly the great monument at Stonehenge, have been used by a rude people for the purposes of assemblage either for civil or religious ceremonial. The existence of an altar, if there be such, would prove it to have been for the latter. The earliest record we have of such a construction is in Exodus xxiv. 4, where Moses builds an altar on Mount Sinai, and sets up twelve pillars according to the twelve tribes of Israel. Joshua (iv. 20) also directed twelve stones to be taken from Jordan in Gilgal, as a memorial of the passage of that river.

Nomenclature of cromlechs.

It formerly was the custom to call every construction of this kind a cromlech. But the subject has lately been thoroughly investigated, particularly by Dr Lukis, in a paper read before the Society of Antiquaries, vol. xxxv. 233, and in another, printed in the Journal of the Archæological Association, September 1864, and the following nomenclature is now generally adopted. The single upright stone (see Plate I. fig 1), is called a *Maenhir*. One stone supported on another, or "half table stone," as it has sometimes been called, is (fig. 2) a *demi-dolmen*. A stone supported on two or more such stones, or a "table stone" (fig. 3) is a *dolmen*. One large stone supported on several smaller, so as to form a small chamber, is a *cist-vaen*. Several dolmens in succession form a *cromlech*.

A single *Maenhir* is also called a *monolith*. Several in a straight line, as those in Brittany and Germany, are called *ortholiths*. If in parallel lines, as at Abury, Dartmoor, Carnac, &c., are *paralleliths*. If in circles, as in the Ring of Brogar near Stennis, Stanton Drew, and Arbor Low, they are called *cyclooliths*. Dolmen standing in a circle, like Rollrich, L'Anresse, Stennis Circle, &c., are termed *peristaliths*. Le Couperon, at Jersey, is square, and Abdon Burf is concentric. Stonehenge, from its trilithons arranged in a circle, is called a *cycotrilith*. It has been pretty clearly proved from excavations, that the cist-vaen and cromlech were sepulchral, all the others were ceremonial, in all probability religious, though Dr Lukis is of opinion, after excavating and otherwise examining about forty of those curious relics of antiquity, that the large, flat, "inclined stones" were not altars, but probably sepulchral memorials. In all instances in the Channel Islands, and in some in England, where a cromlech is surrounded by peristaliths, the circle is exactly sixty feet in diameter.

Sir Gardner Wilkinson, in a very able paper (see the same Journal, March 1862), divides the cromlechs into five classes—1. which he designates the *cromlech proper*, as one large, flat, cap-stone, supported on *three* upright stones; 2. The *cist-cromlech*, on *four* stones; 3. The *many pillared cromlech*, on more than four stones; 4. The *chamber cromlech*, having a roof; and, 5, the *subterranean chambers*. The author supposes the four first divisions never to have been covered with earth. Dr Lukis, however, denies this, and says all stone chambers, whether cist-vaen or cromlech,

were covered by mounds of earth; and he proposes to divide the cromlech into only two classes. 1. Simple chamber, *without* passages; and, 2, The like *with* passages, or covered ways, leading into them.

The chief difficulty in treating of these curious erections of stone is to ascertain their age. That they are the work of persons in a rude state of civilisation is clear. Still, the vastness of such stones, as at Stonehenge, would show they must have been a people of great energy and resources, to effect such an extraordinary labour. All sorts of conjecture have been made as to this latter work. Some have supposed it to be Roman, others have even considered it to be antediluvian. The mortises and tenons, however, show clearly it must belong to the period when iron tools were used; it is impossible to conceive they were worked with flint instruments. The most rational supposition seems that it was erected to commemorate the treacherous murder of the British chiefs at the banquet given by Vortigern to Hengist. It is surrounded by numerous barrows, evidently the graves of men of great importance, a circumstance that adds much probability to the tradition.

Having now discovered the art of quarrying large stones, moving them to different sites, and erecting them in symmetrical forms—having found out the way to construct places for civil, military, or religious assemblages, the next step was to cover these large places by roofs. In all probability this was first attempted in the adytum, or cella of temples, and there is every reason to suppose the earliest of these were the Egyptian. The oldest historian, Herodotus, (Cli. 13) tells us the Persians erected neither statues, nor temples, nor altars, and they considered them as foolish who did so. He also says (*Euterpe*, 4) that the Egyptians were the first to give altars, images, and temples to the gods, and to carve the likenesses of animals in stone.

History of the Progress of Architecture.

We now proceed to trace the progress of the science from its earliest regular formations, of which we have sufficient information, down to the present day.

Indian chronology being so vague and undefined, and the connection of the Hindoos with the civilized nations about the Mediterranean Sea having been so much restricted in the earlier ages that we can get little assistance from the Greek historians on the subject, the date of their architectural monuments can be determined only by analogy. That, however, is an uncertain guide, without proper delineations, and, indeed, without any work that gives a competent idea of them. Though we have held India so long, and by a so much more honourable tenure than the French did Egypt, if we were now to be dispossessed we should leave nothing, and we should certainly retain nothing, to show to our credit that we had ever held it. Such an undertaking as the great work of the French Institute on the Architectural Antiquities of Egypt is far beyond the means of individuals; the constitution of our government appears to preclude the application of funds from the public purse to such purposes; and the East India Company, from whom, perhaps, something of the kind on the archæology of India might have been expected, had, it would appear, occupations of more interest to them than the advancement of science and art. It may be generally stated, that, in its leading forms and more obvious features, Hindoo architecture strongly resembles Egyptian, and may be considered as of the same family with it.

No nation that ever existed within the annals of the Egyptian human race has left structures that, in extent, magnificence, and grandeur, can vie with those of ancient Egypt. We have the authority of historians for believing that

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History. there were others in the same country which no longer exist, that must have surpassed those which do remain; and they speak also of the cities of Assyria, as unparalleled in the extent and splendour of their edifices, whose sites, even, are not now determinable. The pyramids, however, mausoleums of a nation—and the temples, monuments of human folly—speak more strongly than any historian can, and compel our belief of what they have been by what they are; whereas the others do not exist but in name. Nineveh and Babylon were—but Thebes and Memphis still remain. It is strange, indeed, that a people who displayed such energies in the construction of tombs, pyramids, and temples, should have left no work of any description that could be applied to any really useful purpose. Denon, speaking of Thebes, says, “Still temples—nothing but temples—not a vestige of the hundred gates, so celebrated in history; no walls, quays, bridges, baths, or theatres; not a single edifice of public utility or convenience. Notwithstanding all the pains I took in the research, I could find nothing but temples; walls covered with obscure emblems, and hieroglyphics which attested the ascendancy of the priesthood, who still seemed to reign over the mighty ruins, and whose empire constantly haunted my imagination.”¹ Champollion, however, in his late researches, speaks of the remains of quays, and calls some of the structures palaces instead of temples; but as the former exist only in connection with the latter, they can hardly be considered as any thing more than mere embankments; and the regal and hierarchical offices having been so closely connected in the economy of ancient Egypt, it is of little or no consequence to our position whether the same edifices be called palaces or temples. Diodorus Siculus says, in one place, that “Busiris,” believed to be one of the Pharaohs who persecuted Israel, “built that great city which the Egyptians call Heliopolis and the Greeks Thebes, and adorned it with stately public buildings and magnificent temples, with rich revenues;” and that “he built all the private houses, some four, and others five stories high.”² Shortly after, speaking of Memphis, to account for the splendour with which the Egyptians built their tombs, and the comparative meanness of their houses, the same author says, “They call the houses of the living inns, because they stay in them but a little while; but the sepulchres of the dead they call everlasting habitations, because they abide in the grave to infinite generations. Therefore they are not very curious in the building of their houses; but in beautifying their sepulchres they leave nothing undone that can be thought of.” Strabo also speaks of a splendid dwelling which was erected for the priests at Heliopolis, but that probably was one of the sacred palaces just referred to; for none of the ancient writers describe the domestic structures of the Egyptians, from personal knowledge of them, as being worthy of any notice; and that assertion of Strabo is too loose and unsupported by contemporary authority or analogy to deserve confidence of itself. To the statement of Diodorus, that private houses were built to four and five stories high, we can give no credence whatever; for the construction of edifices in tiers or stories was very imperfectly understood even in his time, which was many centuries after the destruction even of Thebes; and none of the existing remains of that city give the slightest indication of a second story, or indeed of aptitude to construct one, except the rude landings in some of the propylæa. Herodotus says that the Egyptians were the first who erected altars, shrines, and

temples; but of their private houses he says nothing; neither does he describe any of the temples as they existed in his time in Egypt; so that he in fact affords no assistance in determining the comparative antiquity of the various architectural structures which remain to the present time in that country. Indeed the ancient historians and topographers speak for the most part so widely of dates and dimensions, that they are, at the best, most unsatisfactory, if not fallacious, guides; and in the present case, that of Egypt, the style of architecture is so uniform, or so imperfectly understood, that no argument can with safety be drawn from it, as there may in other cases. In Hamilton's *Ægyptiaca*, the author says, with reference to this question: “In Egyptian architecture there is an uniformity of structure, both in the ornaments and in the masses, which, if unassisted by other circumstances, reduces us to mere conjecture; and that not only for the difference of a century or two, but perhaps for a thousand years.”³ Again: “The monuments of antiquity in Upper Egypt present a very uniform appearance; and his first impressions incline the traveller to attribute them to the same or nearly the same epoch. The plans and dispositions of the temples bear throughout a great resemblance to one another. The same character of hieroglyphics, the same forms of the divinity, bearing the same symbols and worshipped in the same manner, are sculptured on their walls from Hermopolis to Philæ. They are built of the same species of stone; very little difference is discernible in the degrees of excellence of workmanship, or the quality of the materials; and where human force has not been evidently employed to destroy the buildings, they are all in the same state of preservation or decay.”⁴ But we are fortunately now about to be rid of that difficulty by the erudition and industry of those learned men who have given their attention to the hieroglyphic literature of the Egyptians. M. Champollion professes to have determined the date of every monument of antiquity in that country which is inscribed, by the inscriptions, which he has qualified himself to read. As yet, however, we are not in possession of the whole result of his discoveries.

Hypogea, or spea, being caves formed by excavation, are of earlier date than any existing structures. Internally they present square piers, which were left to support the superincumbent mass of mountain or rock when their magnitude rendered it necessary. These were originally tombs; and the cave of Machpelah, of which Abraham made the purchase as a burying-place for his family, was, doubtless, one of that kind. Oratories or chapels were afterwards made in the same manner, but, it would appear, not until columnar architecture had come into use: for their entrances are generally sculptured into the resemblance of the front of a rude portico, or an actual portico or pronaos is constructed before them. Many such are found on the banks of the Nile, in its course through Nubia and Egypt. At Ibrim, which the Greeks call Primis, in the former country, there are several of these cavern temples, the earliest of which, according to M. Champollion, bears date of the reign of one of the Pharaohs, who was contemporaneous with Abraham, or his son Isaac, or about eighteen centuries before Christ; the latest is of the time of Rhameses Sethos, the Sesostrius of Greek history. To some of the cavern tombs and temples in Upper Egypt M. Champollion accords even a still higher degree of antiquity. The earliest columnar structures which are found within the same range of country do not appear to bear a higher date than that of the

¹ *Voyage dans la Basse et la Haute Egypte*, p. 176. Par V. Donon.

² Diod. Sic. lib. i. cap. iv.

³ *Ægyptiaca*, by Wm. Hamilton, Esq. F. S. A. Part I. p. 260.

⁴ *Ibid.* p. 18.

History. earliest kings of Pharaohs of the eighteenth dynasty of Manetho, which began about the time of the Jewish patriarch Abraham and ended with the Pharaoh from whom his descendants escaped under the conduct of Moses. The temple at Amada, to which we have already referred, is of the time of Moeris, who was contemporary with the patriarch Jacob, and consists of twelve square piers or pillars, and four columns, which possess the form and character of the Greek Doric, and may it is suggested, be called *protodoric*. The same intention, if it may be so called, is found in others of the early monuments, but in none so perfect as in this, as almost all the structures of ancient Egypt were either destroyed or seriously damaged by the Persians at the time of their invasion under Cambyses; and they are supposed not to have ascended the Nile much above Psalcis or Dakkè, but to have turned off by the way across the desert to Ethiopia, so that the temple at Amada, which is considerably above Dakkè, escaped.

Of all the Pharaohs, Sesostris, the first of the nineteenth dynasty, was the most distinguished for the great and extensive works he executed in architecture. Most of the existing ruins in Egypt, anterior to the Persian invasion, are attributed to that monarch by M. Champollion. The immense ruins at Thebes, which have been called the Memnonium and the tomb of Osymandyas, and are popularly called Medinet Abou, are considered by the same inquirer to be those of the Palatial Temple of Rhameses the Great, or Sesostris, and which he therefore calls the Rhamesseion, the ruins at Luxor being those of the Memnonium; that edifice or series of edifices having been constructed by Amenophis Memnon, of the eighteenth dynasty, one of the good and beneficent princes by whom the children of Israel were protected during their sojourn in Egypt. The magnificent structure at the village of Carnack, within the same city, appears however to excel all the rest in extent and grandeur, and is at least their equal in antiquity. It is generally known as the temple of Carnack, but it has been distinguished as that of Jupiter Ammon. It bears inscribed the name of Thothmosis II., the predecessor of Amenophis Memnon. From the existing remains of Thebes, and the relations of historians combined, that city may be assumed to have attained its highest degree of splendour in the time of Sesostris; few of the ruins it presents being of later date than the time of that monarch. This being admitted, and we believe it can hardly be denied, it must be admitted also that the practice of architecture, and of the allied mechanical arts, were already well understood; for the composition of the monuments displays an exquisite combination of simplicity and harmony, which produce the finest effects of beauty and grandeur; while their construction is the apparent result of perfection in the use of mechanical powers. All the Pharaonic monuments, indeed, throughout Egypt and Nubia, are wonders of science and art. The structures of Ombos, Apollinopolis Magna, and Latopolis, between Thebes and the cataract, M. Champollion determines to be generally of the age of the Ptolemies, and some even of the Roman dominion; those, however, which are of comparatively modern date are evidently restorations; others, probably of the earliest ages, having occupied the same sites. Indeed M. Champollion asserts generally that the Ptolemies, and the Ethiopian Ergamenes himself, only rebuilt temples where they had already stood in the times of the Pharaohs, and to the same divinities that had always been worshipped there; and he remarks, that the religious system of this people was such a complete whole, so connected in all its parts, and fixed from time immemorial in so absolute and precise a manner, that the dominion of the Greeks and of the Romans did not produce any innovation;

that the Ptolemies and the Cæsars only restored in Nubia what the Persians had destroyed, and rebuilt temples where they had formerly stood, and dedicated them to the same gods.

Of the arrangements of an Egyptian temple we shall speak when we come to treat of Egyptian architecture as a style. In construction the Egyptians appear to have used wrought stones at a very early period: this probably was induced by the still earlier habit of excavating rocks to form tombs; for the walls in their oldest structures are composed of rectangularly cut blocks in parallel courses; whereas we shall find that the most ancient specimens of walling in Greece and Italy are not so. In the Pharaonic monuments, besides walls built in parallel courses of wrought stone, we find squared piers also; and frequently, in the same structure with them, the peculiarly formed tumescent column with a bulbous capital or head, covered with an abacus or square tablet, corresponding with the size of the piers, and warranting the supposition that that species of column is a mere refinement on the simple square pillar. What dictated its singular form must remain matter of speculation. The cylindrical column with a bell-shaped capital was the next advance, and that also is found in the same structures, though not in the simplest and earliest of them, in which piers occur. Terminal or Caryatic figures are common in those early works, not absolutely supporting an entablature, but placed before piers which do so, and having the appearance of doing it themselves when seen in front. Bold, massive, rectangular architraves extend from pier to pier and from column to column, and are generally surmounted externally by a deep coved coping, or cornice, with a large corded and torus-formed moulding intervening. This masks the ends of the stones which are placed transversely on the architraves to form the ceiling internally, the whole being flushed square on the top, and forming a flat terrace or floor. The pyramidal form of the moles or propylæa, peculiar to Egyptian temples, may have been suggested by the pyramids, as neither that form nor those adjuncts to a temple appear to have been used before the period at which it is supposed the former were constructed. The grandeur and dignity inherent to that form would indeed hardly be suspected till its appearance in the pyramids themselves; and certainly the impression of its effect must have been strong, to induce men to seek it in a truncated pyramid under a very acute angle, as in the propylæa, relying on the tendency of its outline alone. It was gradually, too, that this tendency was generally applied, for in the earliest Pharaonic structures the vertical outline is most common, except in the propylæa, where they exist; and in the structures of the Ptolemies the inclined outline pervades every thing. The monolithic obelisk is of Egyptian origin also. Its tapering form may be the consequence of the impression the pyramidal tendency had occasioned, though perhaps the object itself is the representative of the single stone by which religious feeling appears first to have expressed itself. Obelisks were set up by the Egyptians, sometimes in the courts or atria of their temples, and sometimes before the entrances to them.

Of all the architectural works of the Egyptians, however, none have excited so much the wonder and curiosity of men as the pyramids themselves; not in consequence of any particular beauty in their composition, or ingenuity in their construction, but simply because of their immense magnitude, and unknown use, and antiquity. Denon makes the following observation on his first visit to the great pyramid of Gizeh, at Memphis. "If we reflect upon these pyramids, we shall be inclined to think the pride that constructed them greater even than these masses them-

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History. selves, and shall scarcely know whether to reprobate most the insolent tyranny which commanded, or the stupid serenity of the people which executed, the undertaking. None but sacerdotal despots would ever have undertaken them, and none but a stupid fanatical people would ever have built them....The most honourable reason that can be assigned for their erection is the emulation of man to excel the works of nature in immensity and duration, and in this project he has not been altogether unsuccessful. The mountains near the pyramids are not so high, and have suffered more from time than the pyramids themselves."¹ But Memphis itself was of late foundation in comparison with other cities on the Nile. According to Professor Heeren,² civilization descended by the Nile from Ethiopia with the caste of priests who brought with them the worship of Ammon, Osiris, and Phtha (the Jupiter, Bacchus, and Vulcan of the Greeks), and "the spread of this worship, which was always connected with temples, affords the most evident vestiges of the spread of the caste itself; and those vestiges, combined with the records of the Egyptians, lead us to the conclusion that this caste was a tribe which migrated from the south, above Meroe, in Ethiopia, and, by the establishment of inland colonies around the temples founded by them, gradually extended and made the worship of their gods the dominant religion in Egypt. Proofs of the accuracy of this theory," he asserts, "may be deduced from monuments and express testimonies concerning the origin of Thebes and Ammon from Meroe; that it might indeed have been inferred from the preservation of the worship of Ammon in this last place." The same author goes on to say, that "Thebes was, if not the most, one of the most, ancient cities of Egypt;" and that "Memphis and other cities of the vale of the Nile are known to have been founded from Thebes." Now Thebes exists to the present time in the ruins of her magnificent temples, the works of the Pharaohs, but without the vestige of a pyramid, so that it may be concluded that none was ever built there; and Memphis may be said to exist in the everlasting pyramids of Gizeh and Saccharah, which occupy two of its extremities; but no indication remains of the existence of a temple of any kind: indeed the exact site of the city cannot be determined except by the pyramids. Herodotus, however, speaks of temples at Memphis, particularly of that of Vulcan or Phtha; but certainly no vestige of such has existed for a long period of time within that vicinity. Memphis was a great and ancient capital, and why should it not retain some evidence of the existence of temples in it? But Thebes was a greater and more ancient capital, and indeed the metropolis of all Egypt; and why has it no pyramids? These things are equally unaccountable and inexplicable, affording groundwork for almost any theory, but giving perfect support to none. Mr Hamilton, in his *Aegyptiaca*, before quoted, places Memphis considerably further south, where some ruins have been discovered which may be thought to give a colour to his supposition. But the ruins are of very inconsiderable extent, and are all prostrate, so that nothing can be positively determined by them; and the statement of Pliny as to the relative distances of the Nile and the city from the pyramids of Gizeh being proved to be correct in the one, may be admitted in the other. If Herodotus's account of the building of the pyramids be received, they are of comparatively modern date, the oldest having been constructed several generations after the time of Sesostris, under whom Thebes attained its highest degree of splendour; but this would leave unaccounted for the tendency to pyramidal forms in Egyptian archi-

History. tecture before referred to, unless every example exhibiting that tendency were itself referred to a date posterior to that assigned to Cheops and Cephron, which cannot be done in accordance with the assertions of M. Champollion as to the structures of Thebes, Elephantina, and Nubia generally.

From its immense size, the dimensions of the great pyramid of Gizeh, at Memphis, are variously given by the various persons who have measured it. M. Nouet, who was of the French commission in Egypt, and had perhaps the best means of ascertaining the truth, states its base to be a square whose side is 716 French or 768 English feet in length, which is about the extent of the great square of Lincoln's-Inn-Fields in London; and its height 421 French or 452 English feet, or about one-third as high again as St Paul's Cathedral. It is built in regular courses or layers of stone, which vary in thickness from two to three feet, each receding from the one below it to the number of 202; though even this is variously stated from that number to 260, as indeed the height is given by various modern travellers at from 444 to 625 feet. And the ancient writers differ as widely, both among themselves and from the moderns. On the top course the area is about 10 English feet square, though it is believed to have been originally two courses higher, which would bring it to the smallest that in regular gradation it could be. It is a solid mass of stone, with the exception of a narrow corridor leading to a small chamber in its centre; and a larger ascending corridor or gallery, from about half the distance of the first to another larger chamber at a considerable distance, vertically above the former, in which there is a single granite sarcophagus, not more than large enough for one body, putting the intention of the structure clearly beyond doubt. The other pyramids differ from that of Cheops (as the largest is called) in size, and slightly in form and mode of construction, some having the angles of the steps or courses of stone worked away to an inclined plane, and some not diminishing in a right line. One of the middle-sized pyramids is unlike all the rest, in being neither smooth nor in small steps, but in six large benches or stages, apparently of equal height, and diminishing gradually. But the circumstance which most distinguishes it, is that it is constructed of rude unshapen blocks of stone, cemented together with a very large proportion of mortar. Another is of unburnt brick, and has consequently become ruinous and mis-shapen.

The famous labyrinth, of which Herodotus speaks as having been built by the twelve kings of Egypt, beyond the Lake Mœris, is believed by Denon, after examination of the described site, to be little better than fabulous, and that the historian was imposed on by the priests, from whom he derived most of his information. He says, indeed, that he saw and examined it himself; but his description is so vague, that an architect who should endeavour to make a design from it, would be greatly embarrassed. As we can therefore derive no information from it with regard to architecture, it need not be further discussed here. It has been suggested as probable, and indeed the opinion has been maintained, that the pyramids stand over immense substructures; that their areas are occupied by chambers, in which may be found the arcana of Egyptian lore, of which they are the depositories. If it really be so, may not the labyrinths just referred to have been under the pyramid, which the historian says was constructed at the point where the labyrinth terminates, instead of near it? His expression is so ambiguous, that it leaves room for a suggestion of the kind.

Of the domestic architecture of the Egyptians we have

¹ *Voyage dans la Basse et la Haute Egypte*, p. 77. Par V. Denon.

² *Manual of Ancient History*, p. 54

History. nc knowledge whatever. The statements of the ancient writers on the subject have been already mentioned; but supposing them to be more explicit, and more in conformity with probability, than they really are, without existing remains we could form but a very imperfect idea of what it was. Reasoning from analogy, and the slight information of historians, we should conclude that the habitations of the Egyptians were of a very unpretending description. The already quoted statement of Diodorus Siculus, that "they are not very curious in the building of their houses," even in his time, after their long intercourse with Greece, and their more recent connection with luxurious Rome; added to the fact, that no indications of domestic structures exist in any part of the country, and that the presumed habitations of the priests, in the ancient temples, are small and inconvenient cells; and all these things, taken in conjunction with the mildness of the climate and the salubrity of the atmosphere, we think it must be admitted, warrant the conclusion.

No style of architecture of which we have any knowledge is so well qualified to produce impressive effects on the mind as the Egyptian. The mere assumption of its forms, however, is not sufficient to produce its effects; and drawing is more incompetent to convey an idea of it than perhaps of any thing else in art. To this point the authors of the great work of the French Institute on the antiquities of Egypt bear testimony in strong language. Speaking of the incompetence of drawings to convey just ideas of the grandeur, magnificence, and beauty of the Egyptian temples, and other remains of antiquity, they say, "Despite the care we have given ourselves to describe the Egyptian monuments, we cannot even hope that we have succeeded in giving to others the ideas which we ourselves received from actual views and present contemplation of them; for there are things which drawings and descriptions cannot convey. Geometrical drawings are without doubt quite competent to show the form and proportions of an edifice, its disposition and distribution; but far indeed are they from giving satisfactory ideas of the elegance and effect of structures. Frequently we had to regret how much of the beauty of the original was lost in its geometrical representation on paper; for what in execution was light and graceful, often in the geometrical drawings appeared heavy and inelegant."¹

The materials used in the construction of the Egyptian architectural monuments are, for the most part, granite, breccia, sandstone, and unburnt brick. The granite was principally supplied by the quarries at Elephantina and Syene, for which the Nile offered a ready mode of conveyance; some species were brought down the river from Ethiopia, but we do not find that the materials were at any time brought from any other foreign country. It may be remarked, too, that in the earliest structures the common *grès* or sandstone is principally employed. Excepting the obelisks and some few of the *propylæa*, all the temples at Thebes are of that material. In Lower Egypt, on the contrary, and in the works of later date generally, almost every thing is constructed of granite.

Herodotus informs us that the ancient Persians had neither statues, temples, nor altars; and Diodorus Siculus affirms that the palaces of Persepolis and Susa were not built till after the conquest of Egypt by Cambyses, and that they were constructed by architects of that nation. In this case, as in that of India, we are at a great loss for evidence. The Persepolitan remains, though frequently visited and slightly sketched, have not been explored and delineated by such men as Stuart and Revett, or the

authors of the great French work we have so often alluded to. That the Persian style, though very different in particulars, does bear a relation to the Egyptian family, however, is very evident. Sir Robert Ker Porter, in his travels in the East, says that the first impression he received in his first walk among the ruins of Persepolis was, that "in mass and in detail they bore a strong resemblance to the architectural taste of Egypt."² Nevertheless, there is a strong probability that the Persian is itself an original style, and that the resemblance is merely fortuitous, similar results arising from the same causes, as in Egypt and India; for the eastern parts of that country are believed to have been the earliest seat of the human race. Professor Heeren says of Persia, "It cannot be doubted, that long before the rise of the Persian power, mighty kingdoms existed in these regions, and particularly in the eastern part of Bactria; yet of those kingdoms we have by no means a consistent or chronological history—nothing but a few fragments, probably of dynasties which ruled in Media properly so called, immediately previous to the Persians;"³ from whom the style of architecture may be derived, though indeed we know of no remains of earlier date than those which are properly called Persian. But we may be said to know nothing of Bactria; it may, and probably does, rival Elora, Salsette, and the banks of the Nile, in primitive specimens of architecture.

We have neither historical nor archaeological information that can be depended on to prove what the state or style of architecture was among the ancient Assyrians. Lucian says, however, that their temples were less ancient than those of Egypt. The ruins believed to be those of the great capital of Babylonia present nothing but shapeless masses of brick, from which no idea whatever can be formed as to the style of architecture, or the progress it had made in that country; but some cylindrical and other seals and fragments, in *terra cotta*, found by excavation among those ruins, and now in the British Museum, are sufficiently in accordance with the rest of the eastern antiquities to be received as evidence of the general assimilation of its style of design with that which was common to the neighbouring nations.

The Phœnicians, we are told by Lucian, built in the Egyptian style; but their country retains no memorials of its ancient architecture by which we might confirm or correct his information. Doubtless Carthage and the other colonies of Phœnicia followed their parent country in this particular.

As far as we can judge from the trifling documents we possess of the architecture of the ancient Mexicans and Peruvians, it was of a rude but massive character, and may be thought also to resemble the early architecture of India, Egypt, and Persia more than we can see any reason for, except in the tendency of the mind of man to the same result when he is placed under similar circumstances. An impression to this effect appears to have been made on Humboldt, who, when speaking of a pyramidal mass of ancient Mexico, says, "It is impossible to read the descriptions which Herodotus and Diodorus Siculus have left us of the temple of Jupiter Belus, without being struck with the resemblance of that Babylonian monument to the *teocallis* of Anahuac."⁴

It is an illustration of the fact that the wants and faculties of man lead him to nearly the same results as he becomes civilized, without communication and consequent imitation, that the plans given by Sir William Chambers, of Chinese public and private buildings, might be taken

¹ *Description de l'Égypte*, vol. i. p. 292.

² *Travels in Georgia, Persia, &c.* by Sir R. K. Porter. vol. i. p. 579.

³ *Manual of Ancient History*, p. 26.

⁴ Humboldt's *Personal Narrative*. vol. i. p. 82.