

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XXXVIII.

Copyright, 1892, by TICKNOR & COMPANY, Boston, Mass.

No. 876.

Entered at the Post-Office at Boston as second-class matter.

OCTOBER 8, 1892.



SUMMARY:—

A Belgian Architect required to give Bond for the Accuracy of his Estimates.—The Limits of Professional Responsibility.—Photography in Colors.—The Type-writer in Cryptography and Stenography.—History of the Palace of St. Cloud.—Tinning large pieces of Ironwork.—A Find of Plaster Busts in Egypt.—The Prix de Rome.	17
LOMBARD ARCHITECTURE.—IV.	19
OFFICE-HELP FOR ARCHITECTS.—I.	20
COMPARATIVE MUNICIPAL BUILDING LAWS.—XV.	24
BUCRANIA.—II.	24
LETTER FROM PARIS.	26
ARCHITECTURAL DESIGN AND SOCIAL MANNERS AT THIRYNS AND IN HOMER.	27
THE ARUNDEL MARBLES.	28
ILLUSTRATIONS:—	
Houses, Nos. 34, 36 and 38 Collins St., Hartford, Conn.—The Church of St. Paul, Brockton, Mass.—House at Pittsburgh, Pa.—St. James's Episcopal Church, Leesburgh, Va.—A Competitive Design for the Washington State Building for the World's Fair.	
Additional: Church of St. Martin, Alost, Belgium.—South Transept Doorway, Church of St. Martin, Alost, Belgium.—Villa at Hautot (Seine Inferieure), France.—Court in Bishop's Palace, Liège, Belgium.—Altar Cross for Private Chapel, Welbeck Abbey.—Hunting Lodge, near Malmesbury, Wilts.—Pastoral Staff for the Bishop of St. Asaph's.	30
COMMUNICATION:—	
The Purchaser of an Excessive Certificate.	31
NOTES AND CLIPPINGS.	31
TRADE SURVEYS.	32

AN extraordinary contract was recently made with a public body by an architect in Brussels. The City Council proposed to build a police-station, and appropriated three hundred thousand francs for the purpose. An architect was employed to make the plans and specifications, and prepare estimates. When the estimates came in, a panic, as often happens in such cases, seized some of the members of the Council, who feared that the cost might exceed the estimate. The idea which occurred to them was, as usual, to make the architect responsible for the fulfilment of the contracts; and a resolution was adopted, to the effect that the architect should guarantee with his property, real and personal, that the cost of the building should not exceed three hundred thousand francs, above the foundations. A letter, embodying this proposition, was written to the architect, M. Maquet, who declined, as an architect, to accede to it, saying that it would derogate from the professional dignity of an architect, and would establish a bad precedent. However, as he recognized that miscalculations were likely to occur in carrying out such a building, and that it was natural that the Council should wish to provide against them, he would agree, in case of need, to complete the building himself, at his own risk, within the price named. In case this offer should not be satisfactory, he preferred to withdraw from the affair entirely and to abandon his drawings to the town authorities. The reply of the unfortunate architect was read to the Council, which received it with laughter, and inquiries as to what was the distinction between M. Maquet's guaranteeing the cost as an architect or a contractor; but, it being shown that he had property enough to cover any probable deficiency, it was decided that the guaranty was sufficient.

WE are almost inclined to hope that M. Maquet's calculations may be upset by some unusual weather, or by changes in the price of labor and materials, so that he will be ruined in carrying out his agreement. It is hardly credible that the Council of a city like Brussels, after getting possession of an architect's designs, should present to him the alternative of pledging, gratuitously, his whole property for the success of the undertaking, or of losing all the labor which he had put into the designs; yet that is evidently what M. Maquet feared, and tried to prevent by his foolhardy offer. We do not say that an architect ought never to assume the responsibility for the carrying out of the project on which he is engaged for a given sum; on the contrary, such a guaranty

is often desirable, but, when it is wanted, it should be paid for at a proper price, and not extorted from the architect for nothing, under threat of swindling him out of the fruit of his difficult and delicate labor if he does not submit. There are few architects who understand their business who would not be willing to guarantee that the cost of one of their buildings should not exceed the contract price in consideration of an extra fee, for the guaranty alone, of ten per cent on the contract price, or the estimated price, as the circumstances might require; and no builder would say that ten per cent was too much to cover contingencies; so that, where building operations were to be undertaken for a trust estate, or for public account, there is no reason why the trustees, or the public authorities should not make such an arrangement. We venture to say that in very many cases they would be glad to do so, considering the money properly invested in purchasing security against unforeseen contingencies, and the practice, if it should become common, would do much to promote the interest of prudent and careful architects, who have accumulated property enough to make their warranty good, and who now suffer from the competition of irresponsible designers, who have nothing to lose, and find it profitable to delude owners by gorgeous plans, about the cost of executing which they do not trouble themselves, so long as they can be sure of liberal advances on their fees before the crash comes.

A PROCESS of photography in colors has been put in practice on a commercial scale by MM. Fournier and Guitton, photographers, Rue Taitbout, in Paris, which promises to become of great value. So far as we can judge from the description in *La Génie Civil*, the Fournier-Guitton process is essentially the same as that first proposed by Mr. Ives of Philadelphia. Described briefly, it consists in taking several negatives of the object to be represented, all from the same point of view, but with screens of a certain number of colors interposed between the lens and the sensitive plate. It has long been common to use yellow screens of this sort, for the purpose, in photographing pictures or making portraits, of diminishing the actinic effect of the blues and greens, relatively to the yellows, so that, with such a screen, and a plate properly prepared, a yellow figure, for example, on a blue dress will show, in the finished photograph, light on dark, instead of dark on light, as it will in ordinary photography. In the Ives-Fournier-Guitton process, this principle is extended. A red screen gives a negative with the reds strongly brought out, and the other colors weak; a blue screen greatly intensifies the blues, and sacrifices the others; and so on; and, by employing three or four screens, of the simple colors of the spectrum, a corresponding number of negatives is produced, each giving special prominence to its own color. Mr. Ives completed the operation by making transparent positives from each negative, on glass of the color of the screen with which that negative was taken, and throwing images through these positives, by means of lanterns, on a white surface. The lanterns being so arranged as to superpose the images, each color was projected in its proper place, and with something like its proper value in relation to the others. MM. Fournier and Guitton adapt the same idea to commercial purposes by producing, instead of a lantern transparency, a lithographic plate from each negative, and, by printing successive impressions from each plate, in the appropriate color, by the familiar processes of chromo-lithography, a picture is formed which presents the tints of nature with striking fidelity, so that, where a picture is copied, it is said to be difficult to distinguish between the original and the copy. The whole operation is simple and sure, and the time required to complete it is by no means unreasonable. MM. Fournier and Guitton undertake, in the regular course of their business, to deliver a print in the natural colors in from twelve to twenty-four hours from the time the negative is taken, and their charge for making it varies from one to five dollars, according to size and other circumstances; while the price for each print is considerably reduced if a number are made. It certainly seems as if a process like this would be of great use, and, as its simple character adapts it to the experiments of amateurs, of whom there are many in the profession, we hope that some of them will find time to try their hands at it.

A CURIOUS suggestion in regard to certain possible uses of the type-writer is made by M. Hervé, in *La Génie Civil*.

It is well known that a favorite form of cipher writing consists in substituting certain letters for others, each party to the correspondence having the key by which he can replace the substituted ones by those intended to be read. M. Hervé points out that a secret correspondence of this sort can be carried on very readily by means of any type-writer. All that is necessary is to transpose the types on the type-bars, so that, for example, touching the key marked *A* will print *C*, *B* will print *R*, and so on. After one instrument has been so transposed, the other is to be correspondingly rearranged, so that the key *C* will print *A*, the key *R* will print *B*, and so on. Then *X.*, the correspondent at one end of the line, on receiving a cipher despatch from the other, *Y.*, has only to copy it on his type-writer. The machine, retransposing the letters automatically, will at once give an accurate translation, while *X.*'s reply, written on the same type-writer which translated *Y.*'s original despatch, will form an unintelligible string of letters, which, by copying on *Y.*'s type-writer, will be in its turn translated. A cipher correspondence of this kind has an advantage over the ordinary sort, in that the two parties use different, although reciprocal ciphers, and a comparison of despatches captured from each will give little clue to the meaning of either. Moreover, it would not be very difficult, with some type-writers, which have two space-keys, to make the space-keys actuate types, so that the document would be an uninterrupted string of letters. Such writing is very difficult to decipher, from the impossibility of telling where the words begin or end; yet the corresponding instrument, by mere copying, would translate it perfectly.

ANOTHER use of the type-writer which M. Hervé suggests is an instrument for short-hand writing. Most stenographers, in addition to the characters for sound, employ a large number of abbreviations and signs, usually of their own devising, which no one but themselves can understand. Hence it comes that stenographers cannot read any one else's writing but their own, and occasionally fail to read that when their use of abbreviations has been too liberal. M. Hervé says, very truly, that characters indicating sounds with sufficient accuracy can readily be found in the type-writer alphabet, while a code of abbreviations might easily be agreed upon among stenographers. With such a phonetic system of using the characters, and a reasonable number of abbreviations, it would be easy to write four hundred words a minute on a type-writer, which would be fast enough for the most rapid speaker, while the stenographic writing would have the great advantage of being legible to any other stenographer besides the one who wrote it.

THE beautiful palace of Saint-Cloud, which has never been restored since it was battered nearly to pieces by Prussian shells twenty-one years ago, is to be removed, and, as our correspondent says, the ruins have already been sold as old material. *La Construction Moderne* has an interesting history of the place, from which it appears that the original house on the site of the palace belonged to a family named Gondi. In this house, while it was in the possession of a banker belonging to the family, Catherine de' Medici gave entertainments, and it was in that house that Henry III was assassinated by the monk Clement. Later, the mansion was inhabited by four bishops of Paris, all of the same Gondi family, and then by Jean-François Gondi, the first archbishop of Paris. At this time, the garden attached to the house was already celebrated for its beautiful grottoes and its fountains, the waters of which played musical instruments; but there was a neighboring garden, attached to the house of the Tillet family, which was even more famous, and probably contained at that time, more than two hundred and fifty years ago, the chain of cascades which still forms one of the principal attractions of the Park of Saint-Cloud. In 1680 the property came into possession of the Duke of Orleans, brother of Louis XIV, whom Le Pautre, Girard and Jules Hardouin Mansard successively served in designing and supervising the construction of the palace which is now disappearing. The new building was constructed on the site of the Gondi mansion, and it is probable that some of the substructure, at least, of the ancient house was incorporated in the new one; but nothing appears to be certainly known about the matter. A hundred years later, another Duke of Orleans conveyed the property to Queen Marie

Antoinette, from whom it was taken by the National Assembly and declared public property. It was at first set apart "to serve for the enjoyment of the people," but Bonaparte, as First Consul, found it a pleasant place to live in, and appropriated it as his own residence. Here was concocted the plot of the Eighteenth Brumaire, and to this palace the new Emperor brought his Creole wife. Since that time, although it has been used only as a suburban residence, Saint-Cloud has always been associated with the Imperial house, and its utter ruin and neglect since 1871, has been curiously typical of the estate of the great family which last occupied it.

THE *Revue Industrielle* says that the problem of tinning large pieces of ironwork, which has been studied in vain for many years, has been solved by a poor workman. Hitherto all tinning has been effected by dipping the object in a bath of melted tin. This process is simple, and answers admirably for small things; but to treat in any such way a large article requires the maintenance of large baths of tin, and there are serious difficulties of manipulation. By the new process, all dipping is done away with; the object to be treated is cleaned with acid "pickle" and brushed with solution of neutral chloride of zinc, to which a little sal-ammoniac has been added. It is then sprinkled with powdered tin and exposed to a bright fire. This melts the tin, which spreads evenly and thoroughly over the surface. If the process is really as simple as the description makes it appear, it ought to be found useful in making bath-tubs and sinks. The old tubs, made of tinned sheet-copper supported in a wooden case, have the disadvantage that mice and water-bugs find harbor in the hollows of the wooden case; while the enamelled-iron tubs, which are now popular, although they give no refuge to insects, are expensive, and are apt in time to lose their enamel. If a coating of pure tin could be cheaply applied in place of the enamel, the iron tubs so treated would be the best things for the purpose yet produced, and it is to be hoped that the experiment will be made.

A VERY curious discovery has just been made in Egypt. Far to the south, in Upper Egypt, nearly in the latitude of the First Cataract, is an oasis in the desert, which bears the name of El Khargeh, or Great Oasis. It forms a very fertile tract about eighty-five miles long and ten miles wide, and is still inhabited by seven or eight thousand persons of Arab stock. In ancient times the population was probably much larger, and important ruins are to be seen, with an extensive necropolis. Some of the sarcophagi from this necropolis have recently been opened, and have been found to contain busts of plaster, apparently intended for portraits of the deceased, and elaborately colored. Four of these busts, which appear to date from the Roman period, in the second century A. D., have been sent to the Louvre. All of them represent the heads of men. Two are shown with straight, fair hair, and are supposed to represent Greeks; while the remaining two, one of whom is considered to represent a Syrian and the other a Jew, have very dark brown, wavy hair. All the heads are shown with beards. In the two Greeks the beard is scanty, and one has all shaved off except a tuft under the chin; while the Jew and the Syrian have their beards full, but cut short. The faces and necks are painted pink, and a garment of white material, apparently of wool, is shown around the shoulders. The eyes are made with bits of mica set in deep hollows, and lines of black or brown indicate the lashes. The faces are represented with an expression of careless gayety singularly at variance with the lugubrious surroundings. What was the purpose of this curious adornment of the graves of people who had long lost their ancient religious fervor, and had adopted Greek materialism in place of it, perhaps no one can say; and it is equally uncertain whether the custom was general at the period, or whether the examples already discovered are the only ones. No doubt, further researches will do something to clear up the mystery, and Egyptian scholars will be impatient for them to be undertaken.

THE competition for the Prize of Rome in the Architectural Department of the School of Fine Arts in Paris has been decided, the grand prize being awarded to M. Pierre Bertone, pupil of M. Ginain; the first second grand prize to M. Deperthes, pupil of M. Ginain and of M. Deperthes, and the second second grand prize to M. Tronchet, pupil of MM. André and Laloux. The problem was a Museum of Artillery.

LOMBARD ARCHITECTURE.¹—IV.

Fig. 23.
Capitals from San Giovanni in Borgo.



Fig. 24.

THIS is the proper place for us to examine Lombard sculpture in its *ensemble*. For this purpose, we will endeavor to ascertain the characteristics which it presents in a few later monuments than San Michele.

The sculptures preserved from the Pavian Church of San Giovanni in Borgo, which was destroyed in 1811, offer much analogy to those of San Michele; they, however, indicate a somewhat more developed art, as appears in the bas-relief reproduced in Figure 23, and representing a battle-scene, in which all the details of the costumes and of the trappings are carefully wrought, and as appears still more clearly in the curious capital (Fig. 24), which depicts a siren with long hair falling over her shoulders, a prey to two serpents which have fastened their fangs into her breasts. The strong and careful execution of this bit, and the energy and truthfulness of the attitudes rank it among the very best productions of Lombard sculpture. At San Pietro in Cielo d'Oro, in the same city, the carvings on the façade resemble those just spoken of; but the chiselling of the capitals (Figs. 25, 26) is of a different character. The figures are coarsely designed, and, as it were, scattered about by chance, so defective is their arrangement. The foliage is heavy and flat, with the principal veins studded with small holes. In other Pavian monuments, as San Teodoro and Santa Maria del Popolo, to which the beauty of the brick-laying would assign a much later date, the carving is, on the contrary, thin and dry; we might then say that three different schools of sculpture are exemplified in the churches erected at Pavia in the eleventh and twelfth centuries.

The largest Lombard edifice, the Cathedral of Parma, is also very lavishly adorned with sculptures. The two capitals here presented (Figs. 27, 28) are of thinner composition and colder execution than the work on San Michele; however, there is a great similarity in the general character of the two.

Examples of the same kind of decoration, boldly conceived, freely executed, and of powerful aspect, are constantly encountered in the churches of the eleventh and twelfth centuries; at least this is true of the city structures; in country houses of

worship the sculpturing is often of a crudeness that borders even on savagery. But this very fact shows that it was the work of local artists, and hence we may infer that, during the Lombard era, stone-cutters, if not professional sculptors, were to be found everywhere who were competent to rough-hew at



Fig. 25. Capital from San Pietro in Cielo d'Oro.

need a few ornaments of the kind. Only feeble indications were then left of Byzantine influence except in localities where Greek art made itself felt in consequence of direct intercourse with the Orient.

The profile of the bases is almost always the same as in the Attic base; but they are somewhat higher and are heavier and weaker. The fabulous animals adorning them are generally modelled with simplicity and sometimes are of a very finished type (see Fig. 19). These are often wanting in the oldest as

well as in the most recent monuments, so that no reliable inference as to the age of the edifice can be deduced from the fact of their presence or absence. The convex curves of the mouldings are thinner and the concave shallower, thus making the forms heavy and dry: artistic profiling hardly appears again until the middle of the twelfth century.



Fig. 26. Capital from San Pietro in Cielo d'Oro.

body; this must usually be ascertained from the characteristic details of the hair, the head, the claws or the tail. Monsters, imaginary beings, sirens, griffins, dragons and winged serpents occur not less frequently than wild or domestic animals, among which birds, the lion, horse and lamb are most often met with.

The figures of men and animals are either isolated or grouped to depict scenes. The latter are greatly varied; sometimes they relate to facts of real life, connected with war (Figs. 23 to 28) or the chase (Fig. 21), with fishing (Fig. 22), music, the toilet, or the exercise of a profession (Fig. 20); or sometimes to subjects taken from Holy Writ as the fall of Adam and Eve and the story of Cain and Abel, or of Daniel in the lion's den (Fig. 18); sometimes to allegorical subjects, as the death of the just and the salvation of his soul (Fig. 17), or divine justice welcoming the upright and repulsing the sinner; sometimes to popular tales, as the student wolf (Fig. 27), or the journey of Alexander the Great to the celestial spheres; sometimes to emblematical imagery, as the attributes of the Evangelists, the lamb with the cross, birds drinking from a vase or pecking at a vine, or the pelican feeding her young; sometimes, lastly, to superstitious beliefs, mingled with pagan survivals, to which a great number of figures of monsters bear witness, such as centaurs (Fig. 25), sphinxes (Fig. 15), sirens (Fig. 24), dragons (Fig. 19), etc.

The subjects that can be fully explained or interpreted with certainty are few in comparison with those whose meaning we cannot determine. Doubtless the loss of traditions and changes



Fig. 27.
Capitals from the Cathedral of Parma.

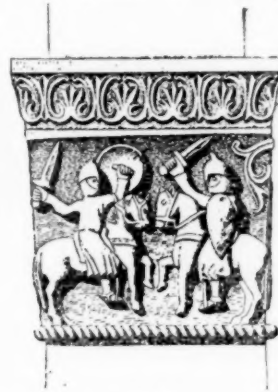


Fig. 28.

in ideas and manners prevent our understanding now many that were intelligible to the artists and the public of former times. But along with those that have become enigmatical are hosts of others which never had any clear significance. Though Père Cahier was able to recognize in a sculpture in the Cathedral of Parma a suggestion of the legend of Alexander the Great ascending to heaven in a willow cage drawn by griffins, the author of the bas-relief was certainly not as well

¹ From the French of F. Dedartain, in Planat's *Encyclopédie de l'Architecture de la Construction*. Continued from No. 875, page 6.

informed, for the essential features of the legendary tale have disappeared from his production; to connect it again with the original, it was necessary to recover a series of gradually degenerated intermediary forms. Many sculptural motives must have passed through the same phases; the ignorance of the interpreters has gradually made them unrecognizable; what was at first both emblematical and ornamental finally became purely decorative. Foliage, which is easier to draw, is better treated. The forms are exceedingly varied, but conventional. The sculptors did not study nature. They copied interpretations that were already greatly altered—carved foliage, Roman or Byzantine lace patterns, embroideries, etc.—and, in doing so, they removed them still farther from the primitive type.

In spite of its progress, Lombard sculpture was far from having freed itself from the usual defects of incorrect drawing, heaviness of form and vulgarity of subjects, before the thirteenth century. But it, nevertheless, produced a good architectural effect; it was employed with intelligence, judgment and a due sense of fitness. Considered as a whole, it constitutes a rich and beautiful decoration. Such are its merits. Unfortunately, the artists lacked intellectual culture; their ideas were limited and misty, and their symbolism seems peculiarly narrow and fallacious. No imposing composition, such as the "Last Judgment," which is so frequently reproduced over the portals of French Romanesque churches, is ever encountered in a Lombard monument. Apparently, the men of learning, the clergy, and especially the monks, did not exercise the influence on architecture south of the Alps that they did in Tramontine countries. They unquestionably never interfered in the construction of any Lombard church, and they seem never to have concerned themselves about the carved decorations. The whole task was left to the workmen; this was possible, because the latter were more skilful at that time in Italy than were their *confrères* of neighboring lands. But to this fact is due, on the other hand, the noticeable moral inferiority of Lombard sculpture. Though the art shows facility, ingenuity and even experience in certain respects, the conceptions which it translates are neither elevated nor enlightened. It appeals to the imagination, rather than to intelligence and religious sentiment.

[To be continued.]

OFFICE-HELP FOR ARCHITECTS.¹—I.

SECTION I.—EARTHS:

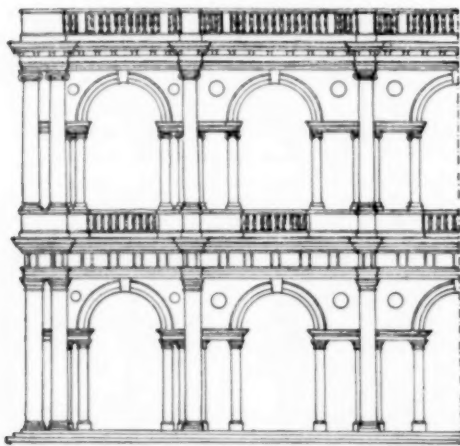


Fig. 1. Detail of Basilica at Vicenza.

§ 1 **General:**—Almost any soil, except dry sand, will stand almost vertically, but when acted on by frost and moisture, or by moisture alone, it tends to assume the slope called the angle of repose, which is usually one and one-half horizontal to one vertical. In excavating, therefore, it is desirable either to at once dress the slope to the angle of repose, to sheet pile, or to leave the excavation but a short time exposed.

In excavating in clayey soils, two things must be guarded against: (a) Seams of clay disintegrated and saturated with water; (b) Seams of Kaolin, either of which acts as a lubricant, and may cause the entire bank to slide in. Should either be shown by the test borings, the services of an engineer

¹ By George Hill, Consulting Engineer.

should be secured to avoid excessive work, or damage to adjoining structures.

In the various geological formations, we may expect the following characteristics:

§ 2 "*Archean*:"—Homogeneous, compact, and quite impervious to water, except when there is a slatey outcrop.

§ 3 "*Silurian*:"—Much the same.

§ 4 "*Devonian*:"—Much the same. Some of the limestone beds are full of voids, fissures, and hidden channels.

§ 5 "*Carboniferous*:"—Compact, and usually quite impervious to water.

§ 6 "*Triassic*:"—Compact, and usually quite impervious to water. The red sandstone occasionally degenerates into a very soft rock, pulverized by frost, and often has seams of soft rock, carrying considerable water.

§ 7 "*Jurassic*:"—Compact, and usually quite impervious.

§ 8 "*Cretaceous*:"—Clays, compact, and impervious. Sometimes full of seams of disintegrated clay, or sand, local in extent, and full of water.

Sands occur in the clays, in the laminated sand and clay marls, and as red sand; in the latter two, the sand when met with a mile or more from the outcrop is usually saturated with water, firm and compact. Lower and middle marl beds are made up of very compact layers, with very soft layers, and should be thoroughly tested.

§ 9 "*Tertiary*:"—Upper marl bed, like lower marl bed. Glass sand very pervious, quite compact and homogeneous.

Sandy clays—non-homogeneous, sometimes pervious, sometimes impervious.

§ 10 "*Glacial and Terrace*:"—Usually gravelly, compact and dry; very irregular in topography, occasionally there are sink-holes, rendered nearly impervious by vegetable mold.

§ 11 "*Quaternary*:"—Alluvial, quite compressible, and impervious. Gravelly earth and terminal moraines, compact and pervious.

SECTION II.—STONES:

§ 12 **Kinds:**—Stones may be broadly described as to their origin, as

Class I—Sedimentary. (a) Fragmental, or those deposits which have undergone no change.

(b) Metamorphic, or those fragmental deposits which have been altered by heat.

Class II—Igneous. (a) Volcanic-rocks, melted by heat, cooled at the surface.

(b) Plutonic-rocks, melted by heat, cooled underground.

§ 13 "*Conglomerate*:" [Class I, (a)]—Formed of various substances united with a matrix of lime, silica or iron; used in cyclopean work, and for stone fence-walls and retaining-walls; not good for buildings generally and affected by intense heat.

§ 14 "*Sandstone*:" [Class I, (a)]—Silicious limestone composed of lime and sand, with sand predominating.

Calcareous sandstone, similar composition, with lime predominating.

Silicious slate, composed of slate and sand, with sand predominating.

All sandstones should always be analyzed, and if any traces of iron are found, should be rejected, as the iron will stain the stones badly. They should be very fine grain, relatively heavy and, to be safe, should be from some well-known quarry.

Resists frost and moisture quite well when laid on natural beds. Nearly all of the sandstones work well under the chisel, and for that reason are called "freestones."

There is a wide range of color from light gray to dark red. Some varieties when first quarried give off considerable moisture, which is not reabsorbed. Some are also very soft when first quarried, getting harder on exposure.

§ 15 "*Limestone*:" [Class I, (a)]—Granular and compact. Formed largely of more or less finely pulverized shells, corals and remains of marine animals deposited as mud and hardened by pressure. Varies in color from a deep blue to a light gray, almost white. The granular usually makes the best building stone, and the compact the better flags. Some are susceptible of receiving a very high polish. Should be of a very fine grain, free from iron, weighing at least 145 pounds per cubic foot. (Caen, France, limestone is the only one weighing less, 119 pounds per cubic foot.)

Taken out in large slabs or in small irregular blocks—in which case it works poorly under the chisel, or in masses of almost any size, when it usually works excellently, and can be carved to any desired extent. When laid in its natural bed

resists the action of frost and moisture well. Resists fire very poorly, usually, cracking or exfoliating very badly. Almost all of our lime and most Portland and Rosendale cements are calcined limestones, having a certain chemical composition.

§ 16 "*Slate*:" [Class I, (a)]—Pulverized rock, solidified under pressure.

"*Roofing Slate*:" [Class I, (a)]—Found in many sections of the United States and Europe. A hard indurated clay, laminar in structure, splitting into thin sheets. The surface of a good roofing slate when split should have a bright metallic lustre and be free from all small, loose flakes or dull surfaces.

Slates vary greatly in resistance to atmospheric and other influences, and should never be used from an unknown quarry until a careful investigation has been made of their weathering qualities. They can be used in a large variety of colors and shades. Unless of unusual thickness, they should not show more than 8" to the weather. Should always be set with galvanized nails.

"*Flagging Slate*" or gray wacke slate, is mostly indurated clay. Similar in composition to roofing slate. Splits in thicker layers, will take a high polish, and saws well. Color: dark gray, blue or red. Resists fire poorly.

"*Mica Slate*:" [Class I, (b)]—Composed of mica, feldspar and quartz. Splits in rather thick layers, is heavy and fine grained. Polishes and saws well. Resists frost well. Makes an excellent flag-stone and fire-stone for lining furnaces.

"*Talcose Slate*:" [Class I, (b)]—Composed of talc and magnesite. Similar in composition and uses to mica slate.

"*Hornblende*:" [Class I, (b)]—A large proportion of hornblende in slate. Has a laminated structure, very hard and dense. Makes a good flagging.

§ 17 "*Gneiss*:" [Class I, (b)]—Sometimes called granite. Composed of hornblende, dark feldspar and quartz, with occasionally mica. A stratified rock, breaking irregularly. When dense, hard and containing but small quantities of mica, makes a good building stone to carry weight and resist frost; does not work readily under the chisel, and exfoliates badly under fire.

When considerable quantities of mica are present, is disintegrated rapidly by frost and atmospheric conditions. When it is laminated, makes an excellent flagging.

§ 18 "*Marble*:" [Class I, (b)]—Changed from fragmental limestone into crystalline, by the action of heat. Should be fine grained; very fine crystalline structure, works well under the chisel, polishes well; can be had in blocks of almost any size. Varies greatly in texture, color, and the ease with which it is cut. Makes an excellent building material, generally resisting frost and moisture well, resisting fire well. Used for statuary, interior decoration, stairs, flooring, etc. Requires great care in its selection when used for building purposes, as some varieties are as strong as granite, and others about as strong as chalk.

§ 19 "*Syenitic Gneiss*:" [Class I, (b)]—Composition same as gneiss, but contains no mica. Is stronger than gneiss, and slightly more durable; quite variable in character; resists frost well and fire poorly.

§ 20 "*Tufa*:" [Class II, (a)]—A volcanic rock, rather light, formed and used in tropical and semi-tropical countries, and there makes a good building material. There are several other varieties of stones used similarly but locally.

§ 21 "*Porphyry*:" [Class II, (a)]—Compact feldspar with crystals of feldspar scattered through the mass. Very heavy and hard; very rare and used almost entirely for ornamentation.

§ 22 "*Trap*:" [Class II, (b)]—Composed of hornblende and feldspar, usually granular and finely crystalline, though occasionally occurring in very large crystals; dense, heavy, resists frost very well, resists fire quite well. Will take a good polish very like granite, but with a greenish tinge. Usually taken out in small irregular blocks and therefore seldom used in building. Works fairly well under the chisel. Makes an excellent paving and macadam.

§ 23 "*Granite*:" [Class II, (b)]—A granular aggregation of quartz, feldspar and mica, in variable proportions. When quartz predominates, the stone is very hard, brittle, and works badly under the chisel. When feldspar predominates, the stone is lighter in color, and works more freely under the chisel. Best granites are of fine grain, uniform in color, weighing about 180 pounds per cubic foot. Sometimes contains iron (protoxide or sulphurate) in which case it should be absolutely rejected. Usually gray in color. Sometimes red, and E. P.

Roberts quarry in New York State, a beautiful pink. When analyzed, hornblende would indicate an increased toughness, schorl, brittleness. Generally resists frost and moisture very well. Polishes beautifully; resists fire very badly, flaking off in large pieces when exposed to great heat. Can be had in almost any size.

§ 24 "*Syenite*:" [Class II, (b)]—A granular aggregation of feldspar, quartz, and hornblende, in various proportions. That hornblende replaces mica makes the only practical difference between it and granite, except where the color is fixed by architectural considerations. All other characteristics are the same as granite.

§ 25 "*Soapstone*:" [Class I, (b)]—A partially indurated talc, quite soft. Used for sinks, laundry-trays, and for lining fireplaces, for which it is excellent, as it resists fire very well.

§ 26 "*Millstone*:"—Hard, presenting a peculiar honey-combed appearance. For ordinary building, makes a good stone, and is excellent for paving and macadam.

§ 27 "*Hornstone*:"—Highly silicious, and very hard. Looks like flint, but is translucent, makes an excellent macadam.

§ 28 "*Blueshale*:" [Class I, (a)]—A variety of sandstone, dark blue in color, quite dense, and hard; resists frost very well sometimes, and fire well. Makes a fair material for foundations and macadam, but not very good.

§ 29 *Size*:—For almost every variety of stone and for each quarry, there is a certain size which is the most economical, and above that size the cost is greatly increased. With increase in size, the cost of handling and transportation is also increased, so that some stones, which in blocks of one-half yard are worth \$1.00 per cubic foot, are worth \$10.00 to \$15.00 or more per cubic foot in the rough in large sizes.

After determining to use a certain stone, the architect should ascertain the most economical size, before making the lay-out on the drawings.

§ 30 *Setting*:—All stones are usually set in a full bed of mortar, a derrick being used, to handle the stone. There are numerous good ways of attaching the fall, and it is usually better to allow the stone setter to use the way he is accustomed to.

In setting any of the granular limestones, sandstones or marbles, great care must be used so that no cement touches the stone, as either Portland or Rosendale cement will stain it badly. These stones are usually sawed so that the joints need not exceed $\frac{1}{4}$ " in thickness: they should be set in Lafarge cement, which is a mixture of lime, plaster-of-Paris and marble dust, and the back of the stone coated with cement $\frac{1}{4}$ " thick. Before specifying the setting, inquiry should be made as to liability to stain. Stones that are tooled should have the thickness of the joints regulated by the character of the work. That is, if the stones composing the face have sawed joints, the stone in the heart work should have sawed joints, otherwise there will be unequal settlement, and cracking of sills, etc. When the stonework is simply a thin ashlar or facing fastened to the brickwork backing by galvanized-iron anchors, the joints need not be made so carefully, but should be thoroughly filled.

For footings and foundation work, no joints should at any place exceed 2" in vertical distance between adjoining stones. For ordinary rubble work $\frac{1}{2}$ " on the face and $\frac{3}{4}$ " on the backing, should be the limit; for ashlar or cut stonework, $\frac{1}{4}$ " on the face and $\frac{3}{4}$ " in the backing should be the limit. In setting sills, the centre should always be left free until the completion of the work. As soon as the stonework is set, the joints should be raked out at least $\frac{1}{2}$ " deep until the work is nearly complete, and then repointed with Portland cement. All joints should be filled full. Rosendale cement mortar may be used except when it is desired, as in tall buildings, to develop as much as possible of the strength of the stone, then Portland cement should be used. The exceptions above noted about staining, must, however be borne in mind. All stones should be set on their natural beds.

§ 31 *Laying-Out*:—This is something requiring great care and some experience. After determining the most-economical size of stone, the entire front should be laid out so as to show the jointing and typical plans made of each pier, showing the internal jointing as well. The stones should be as nearly rectangular in plan as possible, and should be so laid out as to break all vertical joints as often as possible. Whenever a column is put in in one length, a note should be made in the plan to make its bottom joint as thick as three-fourths the thickness of the joints in the stones in the height of the wall behind

it. Piers should be so laid out as to be carried up almost continuously, and the lintels and arches of the front supported on inner piers, so that in the event of unequal settlement, the lintels will not be cracked, but can accommodate themselves. (Fig. 1). When this is done, the trouble can be remedied by

works. One is by hand, and the other by machinery, but generally both are used.

The limestones, slates, and sandstones can usually be prepared up to the final finish of the exposed surface by the use of saws, cutters, planers and grinders. If a perfectly flat plane surface is desired, the saw or planer will give the finish without any hand-dressing. Granite, trap, gneiss, and the like, cannot be so finished, but must be finished by hand. In preparing any stone for use, by hand, the stone-cutter first draws a line by hand all around one surface, using a straight-edge, and a piece of iron ore or black lead: the stone above the line along the edge is then pitched off with the pitching tool.

A draft is then cut along the narrow end about 1" wide with a chisel. This forms a narrow plane, "draft," (Fig. 3), at one end. A similar draft is then cut on the other end, and made exactly true with the first draft, by using two straight-edges of the same width and sighting across them until parallelism is assured. Then similar drafts are cut along the long sides until a straight-edge will touch the end drafts, and all

along the side drafts. This gives as a basis the edge of a plane all around the stone and from this, the stone is squared and trued up on all sides. Warped and curved surfaces are made in a similar manner, except that the faces of the straight-edges are made to conform to the desired curve and are made

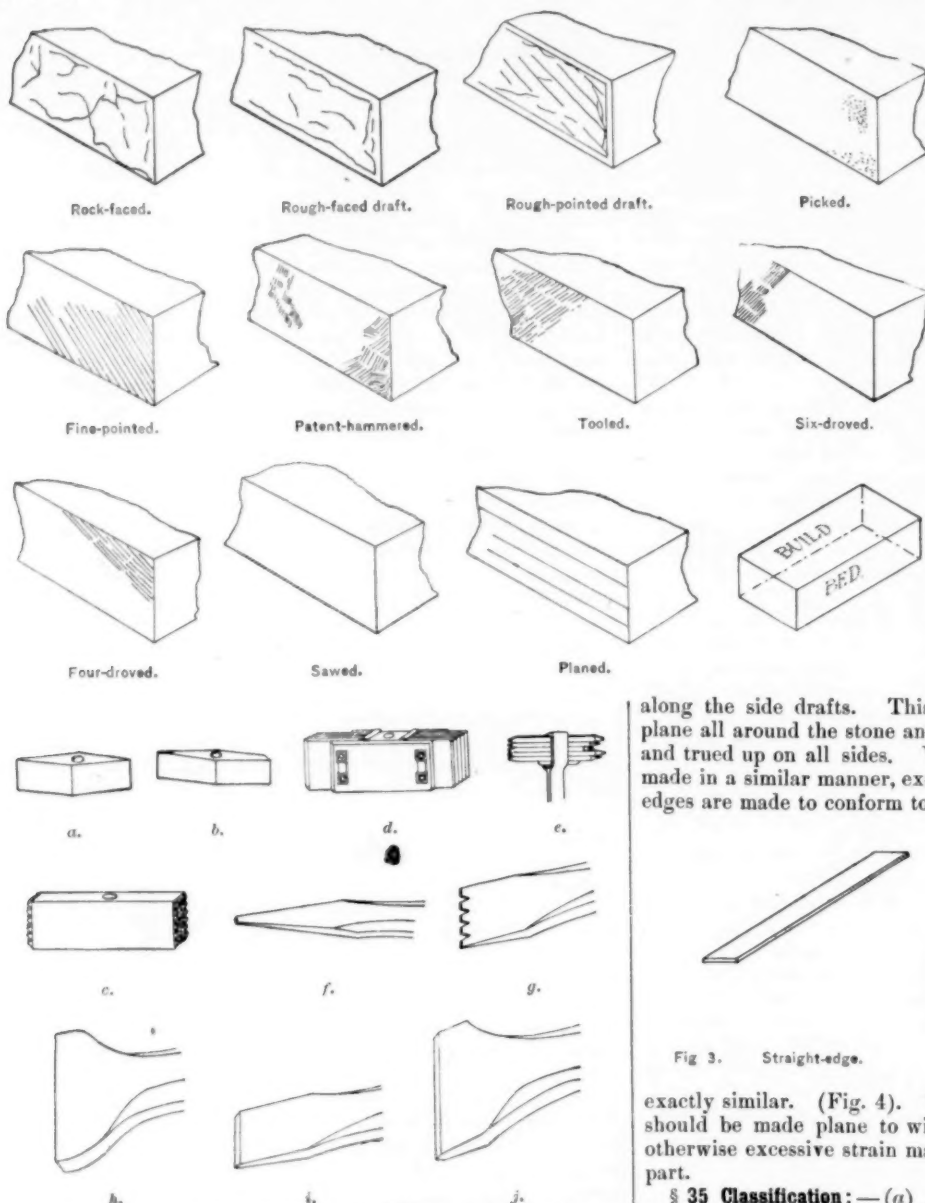


Fig. 2. a. Stone Axe. b. Stone Hammer. c. Bush Hammer. d. Patent Hammer. e. Cradle. f. Point. g. Tooth Chisel. h. Pitching Tool. i. Chisel. j. Drove.

repointing, but if not done, the cracks will always be in evidence, and will lead to suspicion, even if the strength of the work is in no way impaired. Further, the weights from the floors should be concentrated on the piers as far as possible by using girders, and header beams past the openings.

§ 32 **Bond-stones**:—The Building Regulations of some cities require bond-stones in all brick piers less than a certain size; when this is the case, especial care should be used in the building of the piers, as the stones are an element of weakness which must be guarded against.

§ 33 **Templates**:—Are stones placed under beams and girders to distribute the load on the masonry of the walls. They should be at least 4" thick for a width of 12", and should keep the same proportion of thickness to width for all sizes. They should go into the wall at least 12" except where the wall is but 12" thick, then 8". When wider than 20" they should go into wall 16".

§ 34 **Cutting**:—Is done in a large variety of ways and with a large variety of tools.

Different kinds of tools and the finish they give are shown in Figure 2.

Two general methods are used in preparing stone for the

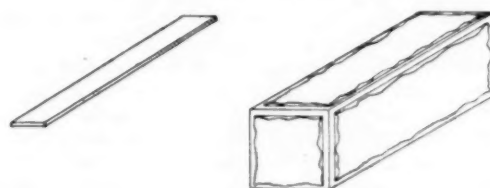


Fig. 3. Straight-edge. Draft-edge cut.

exactly similar. (Fig. 4). The beds and builds of all stones should be made plane to within 1" and parallel to within 1", otherwise excessive strain may be brought on to the projecting part.

§ 35 **Classification**:—(a) Ashlar, in which the joints are all dressed to an approximately plane surface.

(b) Rubble, in which the joints are at most only rough pointed off.

Examples of both and various modifications are given in Figure 5.

§ 36 **Pointing**:—Immediately before the finishing of the works, the joints should all be pointed either with lime putty, (lime, plaster-of-Paris, and white lead), or Lafarge cement, if

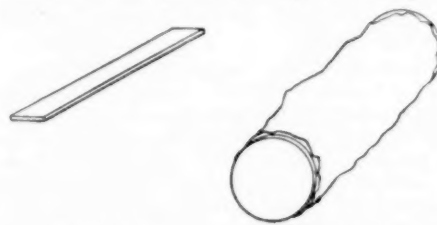


Fig. 4. Curved-edge. Draft cut for a column.

the material will stain, or with Portland cement. Should any coloring be desired, some mineral coloring matter must be used. Pointing should always be done with special tools, cuts of which, and of various styles of pointing, are given later in Figure 6.

§ 37 Cleaning Down:— Proceeds simultaneously with the repointing and consists of removing all stains, dust, dirt, pieces of mortar, etc., from the masonry. It is done with wire brushes and water for marble work, giving it an old appearance; with acid and bristle brushes for all other work. If it is desired to clean down an old front, it is usually done with a sand blast, either compressed air or steam being used to blow a fine spray of sand against the masonry. This takes off $\frac{1}{8}$ " to $\frac{3}{16}$ " of the surface—more if desired, leaving the surface practically the same as it first came from the stone-cutter, and if carefully done detracts in no way from the delicacy of the carving.

§ 38 Working Drawings:— Working-drawings showing every piece of stone with some distinctive mark should be furnished by the stone contractor to the foreman-setter, and each piece

reject the stone, as no chances should ever be taken in works that are intended to be enduring.

§ 42 Tests:— Every stone intended for building purposes, that does not come from some well-known quarry should be tested. (a) By chemical analysis both quantitatively and qualitatively, and the results compared with the analyses of well-known stones of the same kind. Any marked disagreement, if of constituents soluble in water or attacked by sulphuric or carbonic acid should result in rejection. The variations in weight and the amount of water absorbed should not exceed ten per cent. Generally the greater the weight and the less the amount of water absorbed, the better the stone.

(b) By ascertaining the crushing strength of 6" cubes prepared by sawing and tested between pieces of oak $\frac{1}{2}$ " thick,

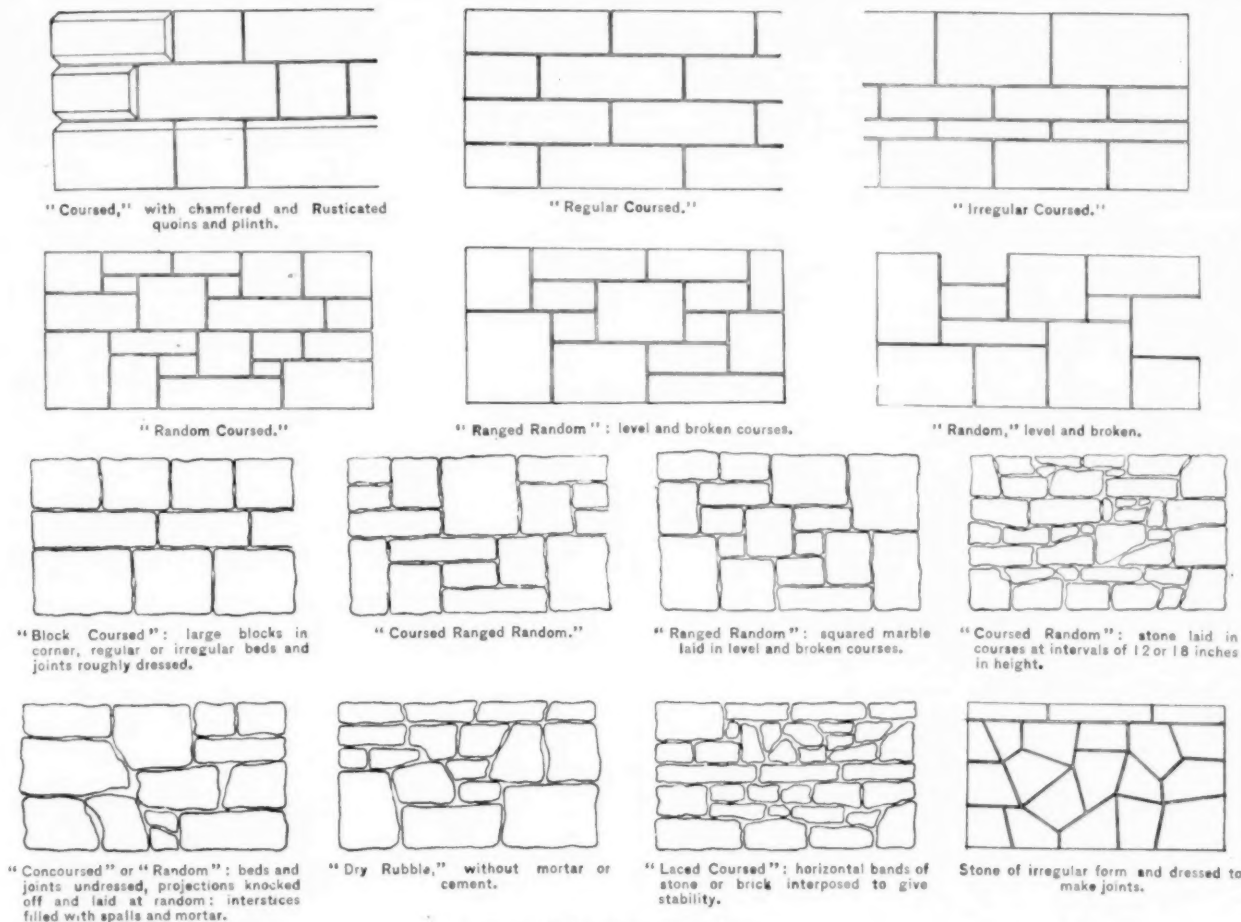


Fig. 5. Series of Cuts showing Masonry.

of stone should be correspondingly marked. Drawings showing all necessary clamps, anchors, etc., should also be furnished by the stone contractor to the iron contractor.

§ 39 Delivery:— A schedule of delivery should be agreed upon by the several parties in interest, and this should be rigidly followed.

§ 40 Protecting:— A clause in the carpenter's specification should provide for boxing all moulded and ornamental work so as to protect it against damage, until completion, using rough white pine. Hemlock stains the stone.

§ 41 Remarks:— In using any new stone the architect should visit a number of works in which it has been used, carefully ascertain the local conditions as to staining, age, exposure, whether north, east, south or west, whether exposed or sheltered, effect of frost, etc., and if possible, find some building where the exposure has been similar to that of the proposed works. He should also visit the quarry to acquaint himself with the facilities for getting-out work, limitations as to size of stone that can be quarried and handled, and should observe the appearance of the outcrop and the action of the stone. If anything suspicious is observed, especially if any indication of disintegration by frost is observed, reject the stone unconditionally. If everything appears right, have chemical and physical tests and reports made, and compare with similar tests of well-known stones. If anything is then observed of a suspicious nature,

and of the size of the block. The strength should be within at least ten per cent of the average for the same class of stones from a well-known quarry.

The stone should contain no seams containing uncemented material, "drys," or dark colored material uncemented, "crow-foots." The fracture should show bright, clean and sharp, without loose grains. It should be homogeneous, compact, without pores visible to the eye and preferably crystalline and not amorphous.

It should always be given at least three months in which to dry out after being quarried.

At least six specimens of 6" cubes should be prepared for testing and sent to the architect's office. The one that most nearly represents the average in appearance should be retained as a sample for comparison and the remainder should be tested. When practicable, they should be selected by the architect at the quarry so as to show a fair average of the material from different parts of the quarry. Each piece should be tested physically and chemically, and the average results should be measurably uniform and should form the basis of the judgment. It is well also to obtain an expression of opinion from the chemist making the tests.

The presence of iron pyrites should always lead to the rejection of a stone that is intended for ornamental purposes.

[To be continued.]

COMPARATIVE MUNICIPAL BUILDING LAWS.—XV.

[Note:—In these tables bracketed letters invariably refer to preceding passages in the same column.]

Chimney Construction.

Boston:—*a.* No chimney shall be corbelled from wall more than thickness of wall.

b. Nor be hung from a wall less than 12" thick,

c. Nor rest upon wood.

d. All chimneys shall be built of stone, brick or other incombustible material. *e.* Brick chimneys shall have walls at least 8" thick, except that with terra-cotta flue linings 4" of the brickwork may be omitted.

f. Other chimneys shall have walls at least 8" thick, and shall have, in addition, a lining of 4" brickwork or a terra-cotta flue lining.

All chimneys shall be topped-out at least 4' above highest point of contact with roof. No nail shall be driven into the masonry of any chimney.

Baltimore:—*g.* All flues shall be topped-out at least 4' above roof, or at height required by Inspector. (*e.*)

All chimneys or smoke-flues shall have a wall at least 9" thick, and, when corbelled out, shall be supported by at least five courses of brick; and, if supported by piers, the latter shall start from foundation on same face with breast above, and shall not be less than one and a half bricks wide on face.

All chimneys shall be bonded to walls at every course from bottom to top.

Brooklyn:—*h.* Every chimney shall be started from the foundation.

i. Except upon a 12" wall, chimney need not start from foundation, provided it wholly rest upon a base formed by racking out that wall with brick or stone an additional 4", and does not project more than 4" beyond wall.

No chimney "shall be cut off to be supported in any manner whatever, provided that such chimney must be supported by an additional wall of 4" built on the inner side of said wall."

Charleston:—Chimneys shall be built of stone or brick and (*h.*), and rise at least 2' above highest part of roof.

Chicago:—*j.* No chimney shall be built with less than 4" walls.

k. No chimney top shall be less than 5' above the roof (for flat roofs), and 2' above ridge of any pitched roof.

l. Any chimney not forming part of wall shall rest upon the ground with proper foundation.

m. In no case shall a chimney rest upon or be supported by woodwork of any description.

Cincinnati:—*n.* Chimneys forming part of wall shall not be corbelled out beyond face of wall more than two-thirds thickness of wall (unless with permission of Inspector as to method and extent of such corbelling).

o. Chimneys not forming part of wall shall rest upon ground or other sufficient fireproof foundation.

p. No chimney or smoke flue shall be built with less than 4" inclosing and division walls, and shall be lined with terra-cotta fire-clay lining or plaster on inside, and on outside where passing between timbers.

q. Chimneys where there are no flues shall be built solid.

r. Chimney tops shall be at least 4' above roof, and any chimney carried above roof more than six times its thickness shall be properly anchored or otherwise made secure.

Cleveland:—(*u.*) (*o.*) (*p.*) (*q.*) (*r.*).

Denver:—(*s.*) (*d.*).

All chimneys shall have a footing of masonry or iron supported by iron or corbels of brick or stone.

s. No chimney shall be hung to 8" wall or bear or rest upon wood.

t. Flues shall be topped-out at least 4' above the highest part of roof, and the topping shall not have more than 4" projection, unless covered by a cap of approved incombustible material properly secured.

Detroit:—All chimneys shall be constructed of stone or brick and (*j.*). All joints shall be thoroughly filled with mortar.

The chimneys shall be built as nearly perpendicular as possible, and without square offsets, and shall be wholly free from woodwork.

District of Columbia:—Chimneys shall be built of brick or stone or other fireproof non-conducting material.

No chimney shall rest upon a floor without a footing of masonry or iron supported by iron bars having a secure bearing on masonry or iron at both ends.

u. Brick flues not starting from foundation shall be securely built into the brickwork of the walls to which they are hung, and shall be supported by courses of brick corbelled out from main wall by successive projections.

v. Where breast of chimney projects more than 9", it shall be started and built on same line from foundation, or, where this is impracticable, secured in such manner as shall be determined by Inspector.

All flues shall be topped-out at least 4' above roof of building to which they belong or adjoin.

Brick topping-out shall not have more than 4" projection, unless covered by a cap of stone or iron properly secured.

Kansas City:—(*d.*) (*s.*).

All chimneys shall be plastered on outside below roof, and shall have footing of masonry or corbels of brick or stone.

No chimney corbelled from wall shall project more than one-half thickness of wall.

Flues shall be topped-out at least 4' above highest part of roof with brick or stone, and the topping shall not have more than 2" projection, unless covered by a cap of approved incombustible material properly secured.

Louisville:—Walls of chimneys shall increase in thickness in proper proportion for height, as do walls in buildings. (This applies only to chimneys such as are part of and in building.)

(*j.*) (*k.*) (*l.*) (*m.*). Foundations for chimneys and stacks shall conform practically to requirements for foundations of walls.

Memphis:—*se.* No chimney shall be started or built upon any floor or beam of wood, and in no case shall chimney be corbelled out more than 8" from wall, and such corbelling shall consist of at least five courses of brick. Where chimneys are supported by piers, the piers shall start from foundation on same line with chimney breast, and shall not be less than 12" on face, properly bonded into walls. No chimney shall be cut off below and supported by wood, but shall be wholly supported by stone, brick or iron.

se. All smoke flues shall extend at least 3' above roof, and shall be coped with well-burnt terra-cotta, stone or iron.

g. Or the four top courses laid in Portland cement-mortar.

Milwaukee:—(*j.*) (*k.*).

Minneapolis:—Any chimney or other conduit for smoke shall be built of brick or other fireproof material other than sheet-iron.

Smoke conduits for boilers, factories and mills and stove-pipes from stoves to chimneys are not prohibited if same be approved by Inspector.

In structures less than two stories high, walls of flues may be 4" thick; in high structures, not less than 8".

a. In no case shall chimney rest upon floor without a footing of masonry or iron, supported by iron beams having a secure bearing on masonry or iron at either end.

aa. In wooden buildings, chimneys not built up from the ground shall be supported on good and sufficient planks or posts from the foundations. No such chimneys shall rest upon brackets.

bb. Flues shall be topped-out at least 4' above if roof to which they belong is flat, and 2' above ridge of any pitched roof.

Nashville:—Stove-pipes shall connect with brick flues substantially built on stone or brick foundations.

No chimney or flue shall be built on any floor, ceiling, joist or beam.

Flues may be corbelled out from wall when they are 13" thick and started from below ceiling far enough to allow stove-pipe to enter 18" below ceiling.

Ordinary flues shall have walls at least 4" thick.

Newark:—Any chimney projecting more than 4" shall be started from foundation.

No chimney shall be cut off in whole or part to be supported below, except by iron columns or brick piers.

New Orleans:—No oven, furnace or forge shall be constructed against a partition wall unless a counter wall of masonry is made, provided that if partition wall is of brick or stone, a span of 1' shall be left between, and, if of piers or plank, a space of 4".

The chimneys of all forges and furnaces connected with steam-engines shall be carried up at least 20' above highest portion of building within radius of 100'.

New York:—(*w.*) (*x.*).

Omaha:—Flues shall be topped-out at least 4' above highest part of roof with brick or stone.

Philadelphia:—*cc.* Every chimney shall be carried up in brick or other incombustible material at least 3' above juncture of any part thereof with roof.

Pittsburgh:—(*cc.*) Chimneys shall be built of well-burnt brick, clay-pipe, stone or iron. The same to have back walls at least 9" thick. Chimneys of forges, etc., carried high enough to be safe and as little troublesome from smoke as practicable.

Providence:—Chimneys shall be built of well-burnt brick, clay-pipe, stone or iron. (*d.*) (*e.*), or a brick topping not having projection of more than 2". Brickwork of isolated chimney shall not be carried over more than 3" to course, nor so far as to throw centre-of-gravity outside base thereof.

St. Louis:—(*f.*) (*bb.*).

No smoke-stack where steam-power is used shall be less than 25' above buildings situated within radius of 300', unless written consent is obtained from owners of such buildings.

All chimneys shall be topped-out at least 4' above part of roof to which they belong, and capped with stone or metal securely fastened, or laid with best hard-burnt brick in cement-mortar.

All smoke-stacks of brick or iron, except on dwellings, shall be carried to 15' above roof or adjoining roof, and provided with spark arrester.

San Francisco:—Chimneys of brick or stone shall commence at ground and extend 4' higher than extreme height of building, and 4' above top of adjoining building if thought necessary by Fire-Wardens.

All buildings within limits, where fire is used, shall have chimneys of brick or stone. Or, in place of such chimneys, those of patented construction, provided written consent is obtained from Mayor, and consent of Fire-Wardens is given, and that name of patentee and date of patent is legibly stamped on each chimney. In frame buildings, chimneys shall not increase in size above base.

Wilmington:—(*d.*) (*u.*), or, where this is impracticable, secured in manner determined by Inspector.

Flues shall not be constructed upon wooden joists or on wood bearings.

When breast of chimney or flue projects 9" or more, chimney shall be started and built on same line from foundations, and built plumb and straight.

Chimneys shall not be topped-out less than 3' above roof.

Compiled by H. A. PHILLIPS.

BUCRANIA.¹—II.

Fig. 8.



Fig. 10.



Fig. 9.

IF human belief and outside religious observances changed and modified themselves through ages under diverse conditions, rites on the contrary, as is easily acknowledged, transmitted and perpetuated themselves and through mere routine were performed as in the past, without reflection or change. In former times, above all, no rites were permitted to be changed; they were sacredly and religiously preserved by the priests.

It is thus that the sacrifices offered in Egypt to divinities and at the time of funerals were still performed by many other peoples, almost with the same ceremonial, especially in Greece and afterwards in Rome; and that with these two peoples sacrifices were also revived and kept with due observance of exterior form. This revival was made sometimes by using the head of a ram; but the most precious and agreeable present to offer to gods was the ox and so

¹ Continued from No. 871, page 154.

they chose the bucranium in preference to the ram's head and this is the ornamentation we shall meet with most often; not, however, the bucranium embellished, surrounded and ornamented as was done by the Egyptian decorator, but the true bucranium, accurately copied, the bucranium in its skeleton state, not very pleasing to the sight, but yet capable of good decorative effect and great impressiveness.

The Greeks, as well as other peoples, their predecessors or neighbors, thought that the different manifestations of the gods might be softened and made propitious to them by prayers or vows, offerings or sacrifices:

"Hic Helenus, caesa primum de more juvenis,
Exorat pacem Divum."

As elsewhere these sacrifices were the occasion of a repast, a sacred repast, a communion between the god and the priests and the faithful, and that repast was supplied by immolated beasts. Moreover every Greek and Roman god had his special and carefully chosen animal, as we have seen with the Egyptians; every animal was not fit for the sacrifice, and even if it were not marked in advance by the priest, it was nevertheless necessary that it should have certain indispensable qualities: for instance, it should have a certain age; its sex should correspond with that of the divinity; it should never have borne the yoke; sometimes it should be white as snow, and besides its horns were gilded and its head was ornamented with small lace bands (*licia*), ribbons, flowers, etc.

"I will bring to thy temple a solemn offering, I will present before thy altars a young white bull, with gilded forehead; he is already as large as his mother; he is already menacing with his horns and is making the dust fly under his feet." (*Virgil*.)

Oxen have been consecrated especially to the great god of the sun Apollo; then to Jupiter, Neptune and above all to Minerva, Minerva Polias, to whom one hundred oxen, presented by the colonies, were sacrificed with great ceremony the 28th of the month of Hecatombæon. When the army was coming back victorious, it went directly to the temple in order to thank the gods and present them with bulls and sheep.

Besides these expiatory or thanksgiving sacrifices, there were also special sacrifices of purification at which three animals, one of them being a bull, were immolated. Finally there were also numerous immolations of heifers and cows. It is thus, as Aristophanes tells us in the "*Clouds*," "that almost every day

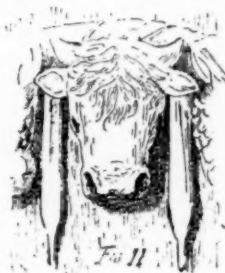


Fig. 11.



Fig. 12.

of the year we see religious repasts and crowned victims," and Plato says: "We are the people who offer the most numerous sacrifices." This is what was going on in Greece. Of Rome, the same might have been said and even more, for the Romans were superstitious and disliked to go into any enterprise without having first propitiated their gods. So that, with these two peoples, sacrifices were always numerous. The Greeks described them by the word *ιεσπεριον* and Latins called them *hostia* or *victima*, according to the sacrifice. Whatever may have been the reason for the change of name, the ancients did not keep all the heads which had been cut off nor did they scornfully throw them away as the Egyptians did; some were burnt upon the altar, others eaten, and those remaining were kept as souvenirs of the accomplished rite. Formerly, after the ceremony, these heads were tied at the corners of the altar upon which the victim had been immolated, or at the doors, or on the walls, or even at the upper parts of temples and tombs: they could be very easily hung because they remained just as they were before having been cut off, that is, trimmed with small bands and garlands, these being very convenient for the hanging. The heads being exposed to the burning sun soon decayed and gave out a bad odor. In order to get rid of these inconveniences and at the same time to allow some of them to remain in full sight, they adopted the custom of hanging them between the ends of the roof beams, between the triglyphs of the temple, in that space which was called *metope*, where was the opening through which Orestes and Pylades once entered the sanctuary of Diana. Through that space the wind blew hard and therefore hastened the drying of the flesh, which soon disappeared leaving the skull clean and smooth. Thus only the bones of the ox's head remained, at once a remembrance of the pious ceremonies and an appropriate decoration at the place where the sacrifices were performed. But later on, for reasons that we need not discuss here, architects thought best to fill the empty space of the metopes by placing between the triglyphs a sort of wooden or marble slab. This slab being set-in a little, offered a field for the decorator.

Naturally, and as a matter of course, it occurred to the ornamentist to indicate on this panel what had been there before and to make an ornament out of it, an ornament which should be at the same time a souvenir, a symbol and an emblem. To this end he almost always

sculptured on this smooth rectangle an ox's head embellished with bands—in anticipation of that ornamentation which dates to the period of the highest development of Grecian art. This was the very beginning of the Greek bucranium, nearly related to the Egyptian bucrania, and later on adopted by Roman artists.

The bucrania of the ancients are most frequently representations of the skeleton or the skinned head. However, numerous examples exist in which the decorator did not wait for the desiccation in order



Fig. 13.

to reproduce it; some are represented with the head skinned, others in their natural state, even with a tuft of hair on the forehead, a death-mask, as it were, taken a few minutes after the sacrifice was performed. So the antique bucranium is presented to us under two very distinct aspects, both being of the same age, as it were, and having been alternately and indifferently used in all epochs.

As for the models of the first type we will name, at random: in Greek art the head of the victim trimmed with falls (or pendants) formed with roses and swags (Fig. 8); in Rome, one of the bucrania which decorated the frieze of the tomb of Cæcilia Metella, which is indicated by modern Italians under the common name of *capo-di-bove*, (Fig. 9).

The second type can be seen on the reverse of a silver coin of Assos, colony of Methymna (Fig. 10), and at the charming circular temple of Vesta at Tivoli (Fig. 11). Whatever the adopted model might have been, in architecture, however, the bucranium was not used at random; they tried to adapt it to the style of the edifice, and the selected order, and to that end it was more or less ornamented and accompanied with different embellishments according as the temple, altar or tomb had been erected in a severe and sober mood, or in a joyous and fanciful one. At least so it seems to me from the different monuments I have studied.

Thus, on smooth and grave Doric friezes, bucrania are simply trimmed with small bands of stuff or leather, as for instance those placed by Philibert Delorme at the bottom of a mantel-piece (Fig. 12). If, on the contrary, it is a work of rich and pleasing aspect, something in the Ionic or Corinthian order, then the bucrania are embellished and ornamented with coquettish additions of ribbons and garlands: of this kind are those on the tomb of Cæcilia Metella, the temple of Tivoli and on the funeral *stèle* in the Louvre (Fig. 13); and also on the crowning of a bronze tripod found at Herculaneum (Fig. 14).

The use of the bucranium has been constant with the Romans;



Fig. 14.



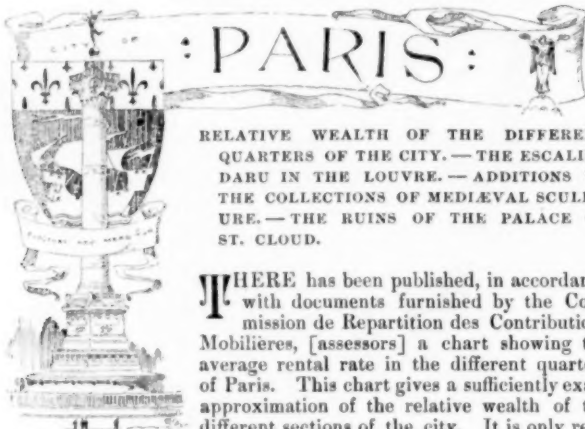
Fig. 15.

we see it at every epoch of their history and even after the beginning of the Christian era. From the time of Hadrian to the end of the fourth century, the taurobolia were celebrated in Italy and Gaul, in honor of Cybele, these bloody ceremonies taking place at the foot of an altar, the faces of which bore a bucranium (Fig. 15,

Taurobolis altar found in the sixteenth century at Tain, Department of the Drôme).

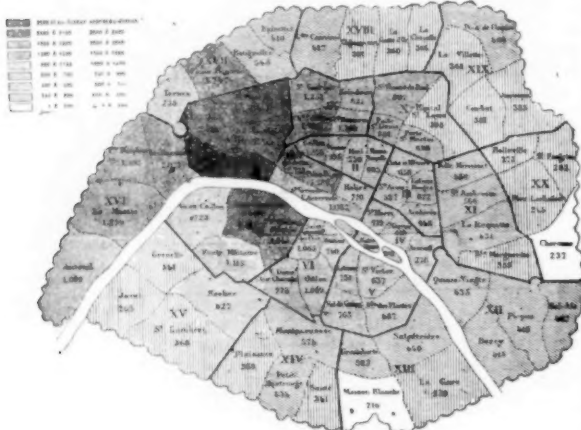
The bucranium will be the last relic of ancient history, for soon new ideas will impose themselves; the quiet and sweet religion of Christ will triumph forever, and with the suppression of sacrifices, with the forsaking of temples and altars as henceforth being useless, this motive of ornamentation will cease to be used because there is no longer a reason for its existence. JULES PASSEPOINT.

(To be continued.)



RELATIVE WEALTH OF THE DIFFERENT QUARTERS OF THE CITY.—THE ESCALIER DARU IN THE LOUVRE.—ADDITIONS TO THE COLLECTIONS OF MEDIEVAL SCULPTURE.—THE RUINS OF THE PALACE OF ST. CLOUD.

THERE has been published, in accordance with documents furnished by the Commission de Repartition des Contributions Mobilières, [assessors] a chart showing the average rental rate in the different quarters of Paris. This chart gives a sufficiently exact approximation of the relative wealth of the different sections of the city. It is only relative, because the numbers used in making the chart are too high. In fact, there is included only lodgings which have to pay a tax, and tenements yielding an income under five hundred francs have been systematically excluded. Now, it should be remarked that out of 806,187 dwellings of every kind, which the city of Paris contains, more than three-fourths, or 622,376, have a rental of less than 500 francs, and out of this number only about 70,000 pay a tax, which the others



are exempted from. It is a matter of proof that the wealth of Paris sensibly increases from the east to the west. Starting at the Maison Blanche, Thirteenth Arrondissement, with the figure 216, the average price of rental increases to 4,031 francs for the Champs Elysées in the Eighth Arrondissement. This difference in well-being is very simply proved. The census of 1886 showed that out of all the quarters of Paris the Maison Blanche returns proportionately the smallest number of domestics (12 per 1,000 households), while the proportion increases to the maximum in the Champs Elysées (1,640 domestics per 1,000 households). Are not these figures curious? Next to the Champs Elysées comes the quarters of the Madeleine (average rental 2,619 francs); then those of du Roule (2,494 francs); the Invalides (2,485 francs); Europe (2,413 francs); and Les Bassins (2,073), the quarters of the Plaine Monceau, of the Chaussée d'Antin, of the Place Vendôme, of Gaillon, of St. Germain l'Auxerrois, of the Palais Royal, of the Faubourg Montmartre, of the Porte Dauphine, of La Muette, of d'Auteuil, on the right bank; and those of the École Militaire, of St. Thomas d'Aquin, of St. Germain des Prés and of the Odéon, on the left bank, have an average value of more than 1,000 francs. The others are far less wealthy. The poorest two are the quarters of the Charonne and of the Maison Blanche.

At the Louvre we have lately taken away the scaffoldings which for eight years have obstructed the Escalier Daru. The staircase, which will be one of the finest parts of the new Louvre when it is finished, connects the galleries of sculpture on the ground floor with the Gallery of Apollo, the Salon Carré and the Salle des Primitifs, and the French rooms. The "Victory of Samothrace" occupies the central landing. The general plan was prepared in 1852 by Louis

Visconti. When, on August 14, 1857, this part of the palace, finished by Hector Lefuel, was inaugurated, it was far from being in entire conformity with the original plans, and the Escalier Daru in especial, with its bald domes, its piers of unwrought stone, and its steps of cement, showed only the sketch of the structure which the grand architect desired to create on the spot where was the old staircase, built by Percier and Fontaine under the Restoration. Hesitation was felt in undertaking the decoration, which made necessary considerable outlays. In 1883, the Ministry of Fine Arts, in concert with the Administration of Civil Buildings, decided that the walls and piers should be clothed in marbles, and the six elliptical domes should be covered with mosaic by French workmen, now well trained by the mosaic-workers of the Vatican, who had just finished the apse of the Panthéon. The programme for this decoration was prepared by the architect of the Louvre, M. Edmund Guillaume, who composed the decorative motifs. Lenepveu was entrusted with the task of painting the figures. The domes were to represent the four following divisions: First, Ancient Art; second, the Middle Ages; third, the Renaissance; fourth, Modern Art. Work was begun on the dome devoted to the Renaissance. September 1, 1884, the scaffold was set up, and the mosaic-workers began their work under the superintendence of MM. Edmund Guillaume, Lenepveu and Gerspach, administrator of the mosaic-factory. Work did not advance rapidly, and it was only at the end of three years that this dome was finished. It contains four symbolic figures, representing France, Flanders, Germany and Italy. Beneath the glazed portion of the dome, a frieze runs bearing winged genii, holding medallions of Poussin, Raphael, Rubens and Albert Dürer. Excluding piers and arches, 108 square metres have been covered. There still remained about 1,000 square metres of mosaic-work to do, and the further support of the Administration of Civil Buildings having been withdrawn in 1886, there appeared to be in this about twenty-six years' more work.

Next, the compartment devoted to Ancient Art was attacked. This is situated above the "Victory of Samothrace," one of the chef-d'œuvres of antique sculpture. It was to be finished in time for the Universal Exhibition, but even to-day it remains incomplete. There appears still a year's more work to do; but these scaffoldings so obscured the staircase, to say nothing of disfiguring it, that it was at length decided to remove them. Moreover, M. Gerspach declared that the mosaic-work could be prepared in the workshops of the Gobelins, and then could subsequently be put in place with speed. It is difficult to judge this unfinished mosaic-work in the midst of architecture which is hardly roughed out. The large figures are relieved against a background of blue, and seem a little stiff, and the eye is confronted with tones that are rather loud. The friezes are good, and the genii, on a gold background, are finely designed. Perhaps when most of this magnificent staircase is finished, these mosaic domes will form a really brilliant and rich crowning feature.

We will not leave the Louvre without indicating some of the new additions to the gallery of medieval sculpture. They are due to the initiative and zeal of M. Louis Courajod, assistant conservator of National Museums. This learned man has visited all the churches of France, and out of all the débris collected from the work-yards or obtained by research has formed, little by little, a varied and very precious collection. To this collection have just been added some new and curious pieces, fragments of gargoyles, of pinnacles, of capitals from the Cathedral of Troyes and the Church of St. Urbain in the same city; also a remarkable fragment dating from the second half of the thirteenth century. This takes the form of a Virgin, half life-size, clad in a robe clasped about the waist with a girdle and half covered by an ample cloak. She wears a crown, and holds out a flower to the Infant Jesus, whom she holds on her knees. The Christ holds a bird, which he is showing to his mother. The smile on the lips of the Virgin, the delicacy of her hands, the charming gesture of the infant, make this statue a remarkable work. It was formerly painted and gilded, as is proved by certain traces of the ancient coloring. We notice, also, a fragment of a sepulchral slab, coming from the Cathedral of Troyes, dating from the end of the fifteenth century. Upon this slab is cut the figure of an old man of great beauty. The upper portion of the body is bare, but the lower part is covered with drapery. The modelling is obtained by simple contours more or less deeply cut. The head has a fine expression, in which the artist attains the ideal without losing sight of nature.

Finally, dating between the beginning of the thirteenth and the beginning of the fourteenth century, I will mention the tympanum of one of the doors of the Cathedral of Meaux, unfortunately a mutilated fragment. This tympanum represents, or rather represented, an Annunciation. The silhouette of the angel, as he prostrates himself before the Virgin can be distinguished, and the expression of the two personages can be appreciated. The angel smiles, and the Virgin, clothed like a maiden of the time, holding in her left hand a book of hours, suggests with her right hand a gesture of surprise. Between them is a vase with a long neck, from which rises the stem of the symbolic lily. These different sculptures allow us to appreciate the charm, nobility and grace which our national art awakened at the outset.

At length it has been decided to do away with the ruins of the Palace of St. Cloud, and soon there will be nothing left of this monument, which in its day witnessed so many splendors and so many atrocities — after the luxurious fêtes of the Empire, the occupation by the Germans, the pillage and the conflagration. Here the

artistic souvenirs are few and far between. The State has reserved to itself all objects which have any interest whatever, and all treasures, if any are found (which is very unlikely), and has also reserved the twelve statues which decorate the façades on the court of honor, three of which only are uninjured. The Duke of Nemours purchased two pediments bearing the arms of the Orleans family and a bas-relief from the chapel. The bureau of demolitions, it appears, is negotiating with an American, who desires to send to the exhibition at Chicago the little bas-reliefs which held a place over each window of the main façade. The sculptures of the chapel, with six pediments, still remain to be sold. Count Pozzo, who has rebuilt in Corsica a portion of the Tuileries, purchased the great wrought-iron balcony which overlooked the garden. All this is of small moment; but what is curious is that what turns out to be of most worth to the demolishers is the cut-stone itself. This is old Bagneux stone, the most resisting and best of the stones from the basin of Paris. It is out of this stone that was built the Church of St. Sulpice, and the greater part of our old "monuments"; but the quarry has been worked out, and for two or three years past the few blocks which have been extracted from it have been regarded rather as objects of art, and the proprietor has demanded for them 200 francs per cubic metre, the normal price being 63 francs.

The purchaser of the ruins of St. Cloud, M. Kasel, had something to do with the purchase of the ruins of the Tuileries. There are a few houses in Paris which can enter on an undertaking of this sort, which demands immense yards for the storage of materials. The sum obtained for the ruins of St. Cloud was three thousand francs, a ridiculous price. The ruins of the Tuileries brought 25,000 francs. It is true they were much more important. At that time the contractor found himself compelled to refuse a hundred thousand francs for four bronze capitals by Philibert Delorme, which he was obliged to turn over to the State.

ARCHITECTURAL DESIGN AND SOCIAL MANNERS AT TIRYNS AND IN HOMER.

THE present is an age of great activity in archaeological exploration and of scarcely less in the discussion of the bearings on history of what the spade of the excavator brings to light. But if the parties to the discussion sometimes seem to get bewildered in its maze, the students who cannot spare time to follow all their devious traces, but still are eager for instruction, are apt to get equally perplexed from not knowing where exactly to look for a clear result. If German dissertations are to be included in our reference we may despair of any clear result—of any fully sanctioned agreement, being come to on any point. We can never



be secure against an appeal—made respectable at least by true Teutonic labor and learning—to reopen an inquiry in favor of a newly constructed paradox. It is to English writers that we may refer more hopefully. They are usually much less given to confining themselves to one point of view, and less afraid of unsettling their judgment by taking up several in succession before adopting a decision. We would fain be able to obtain a well considered judgment on these terms respecting the historical results of the excavations at Tiryns and Mycenæ, as well generally as in particular respecting architecture, but even yet seem destined to be tantalized. This subject is included in the "New Chapter in Greek History" lately published by Dr. Percy Gardner. To the report therefore of the Oxford professor of Classical Archaeology and Art, we turn to seek a satisfactory judgment on controversies so actively maintained and so prolonged. On these two points among others we would gladly be informed: What is the true relation between the scheme of the palace of Tiryns, of which the foundations have been so successfully uncovered, and that of the palace of Ulysses as described by Homer; and then what inferences are fairly to be derived from the plan as to the social characteristics of its occupants.

We find ourselves rather taken aback by two primary assumptions of Mr. Gardner; he assumes that Homer gives but a muddled account of the dwelling of Ulysses, partly from insufficient familiarity,

either personally or by tradition, with such a prehistoric house as that of Tiryns, and partly from inability to work up into consistency a variety of materials. This is what is presented to us:—"The poet of the Odyssey does not seem to be sufficiently familiar with such houses to escape confusion in some parts of his narrative. In the stirring episode of the slaying of the suitors especially, he sometimes nods: we find it hard or even impossible to determine at which end of the hall Odysseus stood when he shot them down, or how Melanthius contrived to fetch the arms. No one can make a vivid and consistent picture of an event of which the scene is not really familiar to him; least of all a poet like the author of the Odyssey—[we hold our breath, wondering what is to come]—who has to work up given material into a new whole." (p. 148-9). This is to betray but a poor appreciation of the power of a poet's imagination to body forth and turn to shape the form of things unknown. Front-de-boeuf's castle of Torquilstone is a tolerably self-consistent structure nor does the free and gentle passage-of-arms of Ashbey de la Touche fail of verisimilitude though worked-up from materials gathered out of old English ballads, Chaucer's knight's tale, "Pericles, Prince of Tyre" and Lord Herbert of Cherbury's "Life of Henry VIII". Nay—Dante is surely vivid and consistent in every canto. But indeed there is no confusion in the Odyssey to favor the notion that the poem is made up out of scraps. Whether we accept or repudiate the theory of the Rev. Mr. Mahaffy that it is a patch-work only less clumsy than the Iliad, the narrative of the slaughter of the suitors is transparency itself. Ulysses, disguised as a beggar, sits with a small table beside him, near his son Telemachus at the farther end of the long hall and opposite to the main entrance. The doors behind him to the women's department of the house are already secured within, and the entrance to the court-yard in front is also made fast. He lays the quiver on the table, and sitting as he is, performs the feat of drawing the bow in which the suitors had failed and sends the arrow direct through a series of rings. He addresses words to the suitors in which they would not discern the covert threat, and then suddenly transfers his position to the opposite end of the hall to bar exit by the door to the court and also to guard a wicket at the opening to a narrow passage from a side door. The suddenness and swiftness of his action is expressed in the short phrase of the rapid narrative.

"He said and with nodding brow signalled and gird himself with his sharp sword
Did Telemachus, son beloved of the divine Ulysses,
And the grasp of his dear hand he closed on his spear-shaft, and there very near him
Beside his seat took his stand, with weapon of bright brass gleaming.
But strip himself of his rags did the manifold counselled Ulysses,
And on the great threshold leapt, with the bow in his grasp and the quiver
Filled full of arrows; and forth the rapid shafts he emptied
Before his feet on the spot, and thereon spake to the suitors.
'This contest has then so far decisively been accomplished;
Again now a different mark, which never has any man yet struck,
Will I look to, if hit it I can and Apollo shall give to me glory.'
He said and against Antinous pointed the bitter arrow—"

The word which is here translated *leapt* and is responsible for the traversing of the length of the hall is the same which Homer employs for the movement of Achilles springing to the attack of a crowd of fugitives, and for that of the arrow of Pandarus starting on its course. Those who are bold enough may blame Homer, if they please, for trusting to such a word to convey the required meaning—but as to the meaning there should be no question. Telemachus left behind for the moment faces Ulysses and pierces in the back a suitor who is rushing to assault him.

Here again as so often in questions between poet and cavilling critic—

"It is not Homer nods but he who dreams."

A further matter open to consideration is whether Professor Gardner rightly interprets the significance of the "marked separation of men's and women's apartments" at Tiryns. He sees in it an indication of the seclusion of women as one among other stately customs of the ancient princely houses, which the wandering and troubled life of the Achæans after the Darian invasion would tend to diminish—a gradual change, of which he sees traces in the Odyssey, p. 169.

The plan, as excavated, certainly exhibits two sets of rooms, which, except in their dimensions correspond very closely in design and arrangement; they are arranged side by side on parallel axes, fronting south; and their intercommunication is partly roundabout and partly indeterminate. The main entry from the gate of the Acropolis leads into a large forecourt, and thence we pass into an enclosed court symmetrically fronting a portico which introduces to a vestibule and thence to a spacious apartment with a central hearth. Corresponding to this on its east side is a smaller hall with vestibule only; an enclosed court in front of it proportionally small and communicating with another court which seems to replace the great forecourt on the other side. In the centre of both the large and the small hall was a hearth for a fire, a similar hearth was found in like position in the foundations of the palace at Mycenæ. Each *corps de logis* has attached to it a number of chambers, but it

is observable that those which are annexed to the smaller hall on its eastern side are more roomy than the others on the west of the larger.

Now considering that this palace was the residence of one in the command of Tiryns—that is, not only of this marvellously fortified acropolis and its garrison, but of its territory also, there is nothing in this distribution which implies any peculiar strictness of feminine seclusion. It exhibits simply the natural division between private and state apartments; between the division required and frequented for the business of administration, council and general transactions, civil and military, or miscellaneous entertainments, and the division occupied by the chief together with his wife and family and their immediate personal attendants. The separation is no more than obtains in every country house, between business room, study, library or gun-room on the one hand, and parlor, drawing-room, boudoir, kitchen and nursery, etc., on the other; or let us say, between officers' mess-room and colonel's quarters in barracks, or governor's house in a citadel.

Access is provided for each division independently, both to the main entrance and to a small postern. Here as in the house of Ulysses—a much meaner, but still very composite design—it would be easy to lock off the private apartments from the public; that the two are placed side by side here instead of one in front of the other upon the same axis, makes no essential difference. So it is that at Pompeii we see a constantly varied juxtaposition of the identical elements of a house to accommodate diversities of site.

Homer might have been familiar by actual residence with every part of the palace of Tiryns and still have departed from its arrangement in framing a description, to suit his incidents, of the far more inconsiderable dwelling of the Ithacan monarch. The differences which are salient to observation are precisely such as might be expected. The private division in both cases is easily shut off from the public; but the intercommunications are much more simple and direct in the smaller establishment. Penelope with her female attendants presents herself to the suitors by a doorway at the end of the hall opposite to the front entrance, and over a threshold which is of stone, not like the other of wood, an indication of stronger construction. By this, when the feasters have departed, the women servants come in to clear away and put all "to rights," and Penelope takes her seat by the fire as she questions the seeming vagrant about her husband. There is no such door at Tiryns, and so far as appears by the excavated plan, the great hall could only be reached by a complete and tortuous circuit from the vestibule; the inference is that there was a true connection with the upper stories by stairs. In the great hall at Ithaca there was a side door into an external lateral passage opening into the forecourt in one direction and in the other communicating with the private division. The latter fact appears very clearly in this way: Melanthius leaves the hall and brings the suitors' arms from a *thalamus* to which they had been removed from the hall by Ulysses in anticipation of the contests.

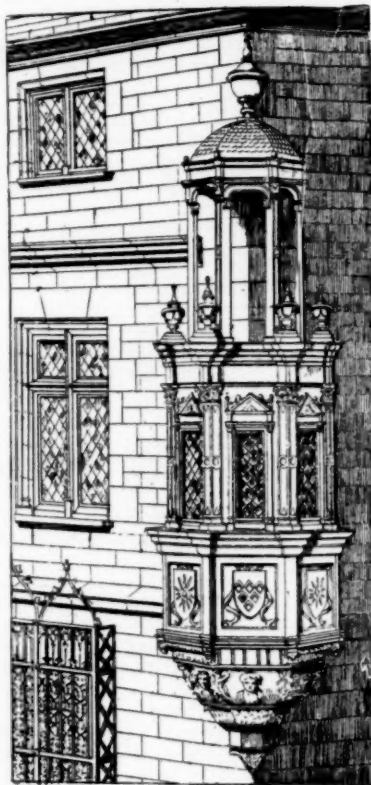
On his second trip he is caught sight of by Eumæus who guards the passage, and is waylaid. The first thought of Ulysses that the treachery was on the part of the women servants, proves that there was in the ordinary way access for them to the passage. In fact, it provided the occupants of the private division with the indispensable means of reaching the *aule*, or forecourt, and main exit without passing through the great hall. At Tiryns this convenience is effected by a long passage which leads from the private forecourts to the propyleum of the main entry; another passage round the back of the palace leads to a postern to which another passage from the public division also gives access, but there is evident provision for closing communication between the two. In all these arrangements we may discern a purpose to keep the private and domestic division of the palace perfectly separate from that which was open to all the bustle which was of necessity incident to the headquarters of a chief whose position required the safeguard of these Cyclopean fortifications. We may safely put aside any purpose of studiously secluding the women; allowance made for the conditions of a fortress there is no reason why they should not have enjoyed as much liberty here as Helen and Penelope, Arete and Nausicaa in the Homeric story. As regards the suggestion that the Odyssey shows traces of a gradual change of manners from prehistoric reserve to later emancipation of Hellenic women our most positive information as to their position in later times points quite the other way, to the development of a disposition to seclude them.

It is rather extravagant to claim that the discoveries at Tiryns have enabled us for the first time to realize the descriptions of Homer. Thus we read, "Truly delightful is it with these facts so securely based in our minds to turn once more to doings of Odysseus and Telemachus in the Odyssey, which no longer seem to have taken place in some dim palace of romance, but in a hall of which the arrangement and details are familiar to us. Through the whole Homeric tale a light spreads like that which the presence of Athens spreads in the hall at Ithaca," p. 102. This is to interchange the burden of obligation. It is Homer who introduces light and life into the scene of desolation at Tiryns and Mycenæ. They must have read the poet but unworthily who had only a dim conception of the precincts he describes without further assistance. The plan of the dwelling of Ulysses could not be clearer than it was before to moderate attention and competent imagination. We gain no addition to our knowledge of the river at Monmouth by learning that there is another in Macedon which also contains salmon.

The endeavor is praiseworthy to elicit as much information as possible from archaeological revelations, but the temptation must be jealously guarded against to rejoice at getting that out of them which we ourselves forced into them in the first instances. We may often be well content to miss acquisition of new knowledge if we at least get confirmation and illustration of what we had before.

W. WATKISS LLOYD.

THE ARUNDEL MARBLES.



Oriel Window, XVII Century, Hotel Marisy, Troyes, France. From Havard's "Dictionnaire de l'Architecture."

THE collection of inscriptions in Oxford, some busts in the British Museum and works in various other places formed part of the treasures which belonged to the second Earl of Arundel and Surrey. He was born in 1586. In the time of James I he acquired most of the honors which were lost by attainder of his father and grandfather. The Dukedom of Norfolk alone was withheld from him. The Earl did not make the usual grand tour until after his marriage; however, he was then not more than twenty-two years of age. He remained abroad until 1611, and from what he saw in France and Italy he became an enthusiast for the arts and literature. The Earl was sent to accompany the Princess Elizabeth and her husband, the ambitious Earl Palatine, out of England. From Germany he proceeded to Italy, and began to collect examples of ancient art. The Earl, on his return to England in 1614, was

received with favor by James I. His conversion to Protestantism, no doubt, was advantageous to him. On the fall of Lord Bacon the Earl was appointed one of the Commissioners for the Great Seal, and he was also restored to the family dignity of Earl Marshal. After the accession of Charles I he continued to stand well at the court, but he was afterwards sent to the Tower for allowing his son to marry Lady Lenox, who was destined by the King for a different husband. After his release the Earl succeeded in regaining his position at court, and he was entrusted with some important missions abroad. He could not escape taking a prominent part in the proceedings which were the prologue to the Civil War. He presided as Lord High Steward at the trial of Strafford, and he was deputed to give the royal assent to the act by which it was enacted that Parliament could not be dissolved without the consent of the members. The Earl of Arundel could not be blind to the troubles that were impending, and, with the sanction of Charles, he left England. After residing in various cities he settled at Padua, where he died in 1646.

One of his contemporaries described the Earl of Arundel in the following words: "He was the greatest favourer of arts, especially painting, sculpture, designs, carving, building and the like, that this age hath produced, his collections of designs being more than of any person living, and his statues equal in number, value and antiquity to those in the houses of most princes, to gain which he had persons many years employed both in Italy, Greece and so, generally, in any part of Europe where rarities were to be had. His paintings, likewise, were numerous and of the most excellent masters, having more of that exquisite painter, Hans Holbein, than are in the world besides; and he had the honour to be the first person of quality that set a value on them in our nation, and so the first person who brought in uniformity in building, and was chief commissioner to see it performed in London, which, since that time, has added exceedingly to the beauty of that city."

The Earl's palace in the Strand, near London, and his country retreat at Albury, in Surrey, were, upon his return to England in 1614, resorted to by men of talents. Rubens was one of his collectors. He patronized Inigo Jones and Vandyke; he brought over Wenceslaus Hollar, the first engraver of merit, and encouraged him

in England, and he employed Nicholas Stone, Le Sueur and Fanelli, the sculptors. It was from the example and recommendation of Lord Arundel, and encouraged by Villiers, who was glad to make the King a competitor of the Earl, that Charles I was induced to study and encourage the arts in England.

As soon as Lord Arundel determined to collect a gallery of statuary, he retained two men of letters for that purpose. The well-known John Evelyn was sent to Rome, and the versatile Mr. (afterwards Sir William) Petty undertook a hazardous journey to the Greek islands and the Morea. In the islands of Paros and Delos, Petty's indefatigable researches had been rewarded with ample success, when, on his voyage to Smyrna, he was shipwrecked on the coast of Asia, opposite Samos, and escaped only with his life. At Smyrna he acquired many marbles of great value, particularly the celebrated Parian Chronicle. The jealousy of Villiers was influential in interrupting Lord Arundel's agents. Sir Thomas Roe, then ambassador at the Porte, was directed to purchase beyond Petty's ability, and to withhold every assistance in his diplomatic capacity which he dare not openly refuse.

The following arrangement was adopted by Lord Arundel for his various acquisitions from Greece and Rome: the statues and busts were placed in the gallery, the inscribed marbles were inserted in the wall of the garden of Arundel House, and the inferior and mutilated statues decorated the garden itself. The catalogues prove that the Arundelian collection, when entire, contained 37 statues, 128 busts and 250 inscribed marbles, exclusive of sarcophagi, altars, fragments and the inestimable gems.

When Lord Arundel left his country seat in 1642, Lord Orford says he transported himself and his collection to Antwerp. Dallaway says, apparently with more truth, that his gems, cabinet-pictures and curiosities only were removed. He adds: "In the general confiscation made by the Parliament, the pictures and statues remaining in Arundel House were in some measure included. Many were obtained by Don Alonzo De Cardenas, the Spanish ambassador to Cromwell, and sent into Spain with the wrecks of the royal collection."

After Lord Arundel's death, his personal estate was divided between his eldest and second surviving sons, Henry Frederick and Lord Maltravers and William, afterwards Viscount Stafford. Henry, second son of the former and sixth Duke of Norfolk, succeeded to the elder share, and, influenced by the previous recommendations of Selden, as well as Evelyn, in 1667 gave a part of his moiety (the inscribed marbles) to the University of Oxford; the remainder descended to his son, the seventh Duke, and were afterwards mostly possessed by his divorced wife.

About the year 1678, Arundel House and gardens were converted into streets. It was then determined to dispose of the statues by sale. The agents tried to sell the whole collectively, but no purchaser could be found. In consequence, a division was made. One portion, consisting principally of busts, was purchased by Lord Pembroke; these are now at Wilton. A second was purchased by Sir William Fermor (the father of the first Earl of Pomfret), who removed them to his seat at Easton Neston, in Northamptonshire, where such as were capable of being repaired had their defects amended and supplied by one Gueli, an artist who misconceived the character and attitude of almost every statue he attempted to make perfect, and ruined the greater number of those which he was permitted to touch. The Countess-Dowager of Pomfret, in 1755, transferred these marbles also to the University of Oxford, where they became again united to the inscribed marbles. Theobald, in a communication to the Society of Antiquaries made in 1758, says that many of the broken statues which were thought not worth repairing were begged by one Boyden Cuper, who had been a servant in the family, and were removed by him to decorate a piece of garden ground which he had taken opposite Somerset Watergate, in the parish of Lambeth, a place of resort for citizens and others in the holiday time, and long after known by the name of Cuper's Gardens. They continued there till about the year 1717, when John Freeman, of Fawley Court, near Henley, in Oxfordshire, and Edmund Waller, of Beaconsfield, in Buckinghamshire, happening to see them, and observing something masterly in the designs and drapery of several, and that they were fragments of very curious pieces of sculpture, agreed for the purchase of them at the price of 75*l*. One moiety of these went to Beaconsfield and the other to Fawley Court. A few statues and broken fragments were given to a Mr. Arundel, a relation of the Duke of Norfolk, who rented a waste piece of ground on the opposite shore of the river, which afterwards became a timber-yard. One or two of these were subsequently given to the Earl of Burlington, and went to Chiswick House. A few remains were carried to Mrs. Temple's seat at Moor Park, near Farnham, in Surrey. Various other fragments which were not thought worth removing were buried in the rubbish and foundations of the houses in the lower parts of Norfolk Street and the other buildings of the gardens. Several of these, including a few trunks of statues, dug up at a later time, were sent down to the Duke of Norfolk's seat at Workshop Manor.

The divorced Duchess of Norfolk, by whom the busts and statues were sold, also possessed the cameos and intaglios, and bequeathed them, at her death, to her second husband, Sir John Germaine. His widow, Lady Elizabeth Germaine, who valued them at 10,000*l*., offered them, about 1755, for that price to the curators of the British Museum, who were not in a situation to bestow so large a

sum upon the purchase, and finally gave them to her niece, Miss Beaucherk, upon her marriage with Lord Charles Spencer, from whom they passed to his brother, the Duke of Marlborough, and were long known as the Marlborough Gems.

Lord Stafford succeeded to a house built for his mother, the Countess of Arundel, by Nicholas Stone in 1638. It stood near Buckingham Gate, and was called Tart Hall. The second share of Lord Arundel's curiosities was deposited there, and produced, at a sale in 1720, 8,851*l*., 19*s*., 11*d*. The house was soon after levelled with the ground.

Lord Orford says the coins and medals of the Arundel collection came into the possession of Thomas, Earl of Winchelsea, and in 1696 were sold by his executors to Mr. Thomas Hall.

The greater part of the Greek inscriptions in the Arundel collection now at Oxford were obtained, as has been already noticed, at Smyrna, where Gassendi says the celebrated Peiresc, who was engaged in similar pursuits, had first discovered them. According to this account, one Samson, Pierese's factor, had paid fifty crowns for the curiosities, but the Turks, having seized on Samson and his collection, with a view to obtain a higher price, the Earl of Arundel commissioned Petty to redeem the whole. They arrived in England in 1627, soon after which, at the suggestion of Sir Robert Cotton, they were carefully examined by Selden in conjunction with two other eminent scholars. Selden, in 1628, published his "*Marmora Arundelliana*," a thin quarto volume, in which twenty-nine Greek and ten Latin inscriptions of this collection are deciphered and illustrated. The Arundel inscriptions were at first let into the wall which surrounds the Sheldonian theatre, each marked with the initial of the name of Howard. They were, however, soon increased by the accession of Selden's private collection and some other donations, so that the whole amounted to 150 inscribed marbles, including tablets, altars, pedestals, stelæ and sepulchral monuments. An edition of the whole was undertaken, at the desire of Dean Fell, by Humphrey Prideaux, then student of Christ Church, but afterwards Dean of Norwich, which appeared under the title of "*Marmora Ozoniensia, ex Arundellianis, Seldenianis, aliisque conflata*," fol. 1676. They were edited with great care, and illustrated by the annotations of the editor, Selden, Lydiat and others. This work was republished fifty-six years afterwards by Michael Maittaire, under the title of "*Marmora Arundelliana, Seldeniana, aliæque Academicæ Ozoniensium donata; cum variis Commentariis et Indicibus, Secunda Editio*," fol. Lond. 1732, with great augmentations as to comment. An appendix, consisting of three Greek inscriptions, subsequently given to the University, was published in 1733, fol. In 1763 the "*Marmora Ozoniensia*" were again published in a new and splendid form, under the auspices of the University, by Dr. Richard Chandler, of Magdalen College, including the ancient inscriptions collected by Sir George Wheeler and Messrs. Dawkins, Bouverie and Wood during their travels, some which Dr. Richard Rawlinson possessed and a few others, with engravings of statues, busts and other marbles to the number of 167 articles, 103 of which belonged to that part of the Arundel collection which the Countess-Dowager of Pomfret had given to the University. The Greek inscriptions of this collection, "*ad Chandleri exemplar editæ*," were separately published at Oxford in 1791 in a small octavo volume.—*The Architect*.

THE POWER OF KINDNESS.—The Meydoun Pyramid stands in the burying-ground of oldest Egypt, and there, day by day, are conducted most careful explorations under the management of Mr. Flinders Petrie. Thus does the tomb yield up its secrets, but these are not more interesting than the fact demonstrated throughout these operations that even the idle temperament of Egyptian workmen is more powerfully influenced by love than by fear. At Luxor, a swearing bully of an overseer hustled the children, with their palm baskets of mould, from pit to bank, lashing them mercilessly at times, and flicking his elephant-hide whip for pure cruelty at the half-naked bodies of the poor little boys and girls who, in the name of science, were working like slaves, through heat and dust, to bring back the colossi of Rameses the Great, or the temple of his father, Seti, from the grave of centuries. It was a sight to make one's blood boil, to see the lash curl with a crack round the leg of a lad, or the naked ankle of a girl, as they toiled up the steep bank with a heavy palm basket on the head. Sometimes it would bring the poor creatures to their knees, but when I remonstrated I was told: "It matters not! No whip, no work." Now Mr. Petrie gets twice as much work out of his men and boys as does this bully at Luxor, and yet his intercourse with them is uniformly gentle and serene. It was refreshing to sit there in the shadow of those vast mounds, at the building of which the land had groaned and the lash had been busy, and to see how men to-day labored with the same tools, dressed in the same way, had much the same simple wants to satisfy, and the same home to return to at eventide. A light was in their faces, and a smile on their lips, for they toiled for honest bread at honest prices, and their master was a friend. That evening I heard a boy's voice, and saw a boy's hand thrust through the tent where we sat. Mr. Petrie cut a piece of soap in two, and gave the lad half, saying, quietly: "I find there's nothing like soap for sore heads." Soon another voice piped in the darkness, and the same knife now dived into a pot of ointment, and spread some carefully on a bruised face. Presently, with a low salaam, a dusky man with an ache in his dusky stomach applied for cure. The paraffin lamp was kindled, a cup of coffee was made, and a spoonful of pepper stirred therein. The poor fellow swallowed it with a gurgle, and turned to go. "May God increase your goods exceedingly!" were the words of thanks, and the grateful ones went back to their reed huts, their burnouses and sandy beds for the night.—*Gentleman's Magazine*.

ILLUSTRATIONS

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSES NOS. 34, 36 AND 38 COLLINS ST., HARTFORD, CONN. MESSRS. COOK, HAPGOOD & CO., ARCHITECTS, HARTFORD, CONN.

[Gelatin Print issued with the International and Imperial Editions only.]

THESE houses were built by Mr. Chas. Collins of Yonkers, N. Y. as an investment. The land was practically valueless, being a steep hillside sloping down to railroad tracks and used only for pasturage. There are two full stories below the street level, necessi-



tating a heavy bank wall along the front. The block cost \$15,000, and rents for \$1,700. Mr. Hapgood, of the firm who designed it, occupies the middle house.

THE CHURCH OF ST. PAUL, BROCKTON, MASS. MESSRS. CRAM, WENTWORTH & GOODHUE, BOSTON, MASS.

ST. PAUL'S Church will stand on the corner of Pleasant Street and Pleasant Place, Brockton. The material will be seam-faced granite, trimmed with Nova Scotia sandstone. The church alone will be constructed at first, the parish house and rectory being left until some future time.

HOUSE OF G. W. ALLYN, M. D., PITTSBURGH, PA. MR. S. T. MCCLARREN, ARCHITECT, PITTSBURGH, PA.

THE cost of this house, which is of brick and stone finished in hardwoods, was \$13,000.

ST. JAMES'S EPISCOPAL CHURCH, LEESBURGH, VA. M. LÉON DESSEZ, ARCHITECT, WASHINGTON, D. C.

THIS church is to be built of local stone. The foundation to be of dark blue gneiss, and the superstructure of dark blue limestone; all to be set "random rubble." The jambs, arches, coping, steps, etc., to be of dressed "Warsaw bluestone." Roof covered with blue "Peachbottom" slate. Interior woodwork to be of Georgia pine, natural finish. Walls above wainscoting to be rough plastered. Ceiling sheathed. The arched trusses to show. Lectern, pulpit, choir and communion rails to be of brass.

A COMPETITIVE DESIGN FOR THE WASHINGTON STATE BUILDING FOR THE WORLD'S FAIR. MR. JOHN PARKINSON, ARCHITECT, SEATTLE, WASH.

THE competition occurred last November. Three designs were selected, viz, those by Architects Ritchie, of Seattle, first place, Bullard & Heywood, of Tacoma, second, and Skellings, of Seattle, third. Mr. Burnham, Chief of Construction, of Chicago, refused to allow the selection of the Washington State Fair Building Commission to be placed on the grounds and selected that by Mr. Skellings, the third prize design, a decision which met with the general approval of the competing architects. The Commission reported the design herewith sent as the most beautiful but that it ought to be built in white marble and offered a few other reasons for dropping it. It was the intention to shingle the building with wood and stucco ornamentation. The plan was semicircular, simple and easily constructed within the limit of cost, viz, \$50,000.

[Additional Illustrations in the International Edition.]

CHURCH OF ST. MARTIN, ALOST, BELGIUM.

[Gelatin Print.]

APART from the Hôtel de Ville, almost the only building of architectural merit in this little manufacturing town, is the unfinished Church of St. Martin. The choir, transepts and one or two bays of the nave are all that were ever built. The building dates about 1498.

SOUTH TRANSEPT DOORWAY, CHURCH OF ST. MARTIN, ALOST, BELGIUM.

[Gelatin Print.]

VILLA AT HAUTOT (SEINE INFÉRIEURE), FRANCE. M. HODANGER, ARCHITECT.

[Copper-plate Etching.]

COURT IN BISHOP'S PALACE, LIÈGE, BELGIUM.

It is sometimes said that the Gothic period in Belgium came to an end with the Bishop's Palace in Liège. The buildings of any importance which were erected subsequently were examples of the Renaissance. It will be evident from Prout's drawing that the palace could only be raised at a time when there was more or less dissatisfaction with existing forms and a change of style was to be anticipated. The columns of the palace can be by no effort of the imagination be considered as a legitimate development of the ordinary Gothic column or of those which are seen in carved screens. They are signs that the old rules had lost their power with designers, and suggest that the Renaissance really preserved architecture from lawlessness, into which Gothic was degenerating.

The palace in Liège has had, however, illustrious admirers. Charles V considered it to be the most magnificent example of architecture in Christendom, and Queen Margaret of Navarre was no less enthusiastic about its beauty. At a later time critics have also found much to admire in the novelty of the treatment. But while admitting the strangeness, which is unsurpassed out of India, we must say that the columns do not show that restraint which disciplined strength imposes on itself. Evidently the designer's only aim was to depart as much as possible from precedent.

It must be acknowledged, however, that owing to the present condition of the building the effect which the courts produced in their pristine condition may not be fully realized. Originally there were two courts, and as the upper story seems to have been continuous and uniform and the openings in the lower arcade were of the same span, it was requisite to express a distinction by means of the columns.

The remains which have survived belong to the third palace in Liège. One constructed in A. D. 973 was burnt at the same time as the cathedral, that is, in 1185. The second palace was also destroyed by fire in 1508. The new palace was commenced in 1511, and the works took thirty-two years to complete. The great fire which occurred in 1734 brought ruin to the third palace, for the works which were afterwards undertaken were inferior to the parts which survived the flames.

Gelatin prints of this building may be found in the *American Architect* for August 16 and 23, 1890.

ALTAR CROSS FOR PRIVATE CHAPEL, WELBECK ABBEY. MR. H. WILSON, ARCHITECT.

HUNTING LODGE, NEAR MALMESBURY, WILTS. MR. H. WILSON, ARCHITECT.

PASTORAL STAFF FOR THE BISHOP OF ST. ASAPH. MR. J. D. SEDDING, ARCHITECT.

COMMUNICATIONS

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE PURCHASER OF AN EXCESSIVE CERTIFICATE.

SARATOGA SPRINGS, N. Y., September 17, 1892.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you kindly give me a decision, if possible, on the following:

What rights has a third party who has purchased an excessive architect's certificate in good faith, the owner disputing the amount of certificate?

Please answer and oblige

Yours respectfully,

R. G. SMYTH.

[No rights whatever against the owner. Of course, the purchaser is entitled to recover back from the contractor what he has overpaid him for the claim.—EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

PROFIT THROUGH FIRE-LOSS.—All information on the subject of the large increase of late in the fire-waste of the country points to the growing element of moral hazard as the responsible factor. It is certain that improved building methods are coming to be more generally adopted, and the use of protective devices, under the persuasive power of reduced rates, is spreading rapidly. Any changes in the condition surrounding fire-departments and water-supplies are more apt, in these times, to be progressive than retrogressive. Underwriters' organizations throughout the country have demanded that many minor improvements be made in mercantile risks especially, and have succeeded in having their demands enforced. Still, with all these apparent difficulties placed in the way of the "fire-fiend," losses continue to pile up, last year reaching the enormous aggregate of \$140,000,000. Some very high authorities blame the insurance companies themselves, or more strictly speaking their agents, as contributing, to a certain degree, toward this result by placing temptation in the way of the insured in the form of over-insurance. Certain it is that sufficient care is not exercised in this direction by many agents whose immediate interests may appear to be best subserved by writing as large lines as possible, without regard to probable losses. Another class of agents, who look farther into the future, can readily see that their true welfare is identical with that of the companies they represent, and that a low loss-ratio on slightly smaller premiums is to be preferred to a heavy one on somewhat larger income. As applying to States having valued-policy laws, the force of this argument will be quickly recognized; it is equally applicable to any location. In a recent number of a trade journal, it spoke of the satisfaction with which a group of workmen were observed to be gazing at the ruins of a large warehouse. One of them was heard to remark, "That's a good job o' work for lots of us next spring." This opens up another view of the effect of general prosperity, or the reverse, among business men. It draws attention to two classes who might be benefited by a large factory fire, for example: The owner, who has been conducting an unprofitable business, carries heavy insurance on a depreciated stock; the employés, part of whom may have been discharged, have had their wages cut down. Both would reap some advantage from a fire which would wipe out the old stock and necessitate the rebuilding of the factory and the manufacturing of new goods. A city with a large floating population of the unemployed contains an element which should be constantly guarded against. Incendiarism is on the increase, and some method should be devised for successfully combating it. The action of the National Board of Fire Underwriters in memorializing the President of the United States upon the question of the annual fire-waste was a step in the right direction, which should be followed up by pressing for action by State legislatures and municipal authorities in the direction of requiring strict investigation of all fires, and punishment of those found guilty of either arson or criminal negligence. Such action as this would be productive of much good; it would reduce the number and extent of fires very materially, would give encouragement to capitalists to invest their money in fire-insurance companies, and, by producing a full supply and reducing the hazard, would enable the insuring public to obtain all necessary insurance at much reduced rates. While it is too much to expect that such a desirable state of affairs can be immediately brought about, continued agitation of the subject and periodical, vigorous prodding of legislators may accomplish some good.—*The Spectator*.

THE FRINK SYSTEM IN CHICAGO.—I recently mentioned the likelihood that the art-section of the World's Fair at Chicago would be lighted by the Frink system of reflectors—the only system I am acquainted with which would be adequate to this important purpose. I have studied the various methods of lighting picture-galleries for a number of years, and have on occasions experimented in that direction myself; and under no other system than the Frink have I found it possible to avoid those numerous drawbacks in the reflection and refraction of light by which pictures suffer so much under artificial illumina-

tion. In view of the vast preparations for the art-exhibit at the Chicago Fair, therefore, it struck me as a matter of the first importance, both in justice to the exhibitors and for the benefit of the public, that the managers should give especial attention to this important feature of their galleries. I now learn that the Frink system has been finally adopted by Mr. D. H. Burnham, Chief of Construction of the Exposition, for use in all the seventy-eight galleries of the fine arts. The award was, moreover, made upon the tested merit of the system. Mr. James W. Ellsworth, who owns one of the finest private collections in Chicago, is Director of the Exposition, and his two private galleries have been fitted with the Frink reflectors. Their practical application, with completely successful results, led him to recommend their adoption for the department of the Exposition in which he was specially interested, and in his endorsement of them to the architect, he wrote: "After thorough investigation of the lighting, by artificial light, of picture-galleries in New York, I have convinced myself that there is but one method of reflectors which gives absolute satisfaction, in connection with which, I believe, there is nothing to be desired, and which is absolutely perfect. This is the Frink system of reflection. I have ordered them for my own gallery here, and have spoken of them in connection with the Art Institute galleries now being constructed, and I desire, as one of the members of the Art Committee (and will obtain the endorsement of the entire committee to this) that it should be used in the galleries of the Exposition grounds. I feel so great an interest, as do Mr. Hutchinson, Mr. Ives and others of our committee, respecting the lighting of the pictures when in place there, that I trust there may be no question but that the Frink reflectors may be used. I have talked this matter over very fully with the Frink people, in the interest of the Exposition, and as to results they will give you every guaranty necessary, providing you may have any question in your mind relative to the latter point." Messrs. Charles L. Hutchinson and Halsey C. Ives furnished emphatic endorsements of Mr. Ellsworth's commendation, and the adoption of the system followed soon after. The artists who exhibit at the Fair, therefore, the collectors who loan works for exhibition, and the visitors to the galleries, may congratulate themselves that the beauty of the display will not be marred by bungling devices or insufficient contrivances under which it otherwise might suffer.—*The Collector*.

A DINNER-PARTY AT THE BOTTOM OF THE SEA.—Some time ago the labor of deepening the harbor of Ciotat was completed. On that occasion the contractor gave to the members of his staff and the representatives of the press a banquet unprecedented for its originality. The table was set eight metres below the level of the sea, at the very bottom of the harbor, inside the "caisson" in which the excavators had been at work, and only the narrow walls of this caisson separated the guests from the enormous mass of water around and above their heads. The new-fashioned banqueting-hall was splendidly decorated and lighted, and, but for a certain buzzing in the ears caused by the pressure of air, kept up in the chamber, in order to prevent the in-rush of the water, nobody would have suspected that the slightest interruption in the working of the air-pump would have sufficed to asphyxiate the whole party. After the banquet an improvised concert prolonged the festivity for several hours, after which the guests reascended into the open air.—*La Vita che si vive*.

ARTIST AND WALKING-DELEGATE.—The New York *Sun* tells this almost incredible story of an artist, a member of the National Academy of Design, who had undertaken the decoration of a private residence. He engaged a fellow-artist and Academician to paint pictures on the walls of one of the rooms. While this painter was at his task a walking-delegate came up to him, and this colloquy occurred: "Do you belong to the union?" "What union?" "The fresco-painters' union." "No; I am not a fresco-painter, I am an artist." "Well, if you don't join the union I shall order out every man at work in the house." Under that threat, and because his fellow-artist, who had agreed to complete the decoration, would lose money if such a strike occurred, the artist was forced to join the union, pay the dues, and put himself under the authority of the walking-delegate as an artisan slave!

CASTE PREJUDICE.—The *Morning Post* writes: "The Sanitary Commissioner, Central Provinces, brings to notice the baneful effects of that caste prejudice which drives people away from the best wells; and what was true of the village in the Bhandara District, to which attention has been called, is, no doubt, true in similar circumstances of the entire Province. In all schemes for improving village water-supply the provision of separate wells for the low castes should never be neglected. In the Northwest Provinces the experience has been just the other way, the low castes freely using the water-supply and leave the rich and wealthy to indulge in their prejudices of caste and adhere to the wells. In this connection we might adduce the experiences of Colonel Jacob, in connection with the Jeypore water-works, where the people at first refused to take water from the lion's head stand-posts because the water flowed out of what resembled a dog's mouth!"—*Indian Engineering*.

REMOVING THE CROWN FROM PUBLIC BUILDINGS IN PARIS.—The French Government, our Paris correspondent states, has taken steps for erasing the emblems of late monarchies that have been left on public buildings in Paris. This order is not to apply in cases where such emblems have a purely historical significance such as the carvings on the walls of Cluny, the Summer palace of the Emperor Julian, which remind us that the Roman Caesars held sway over what has become France. But there is surely some incongruity in the Imperial Crown of the first and third Napoleons over the main entrance to the Elysée.—*London Daily News*.

FREAKS OF LIGHTNING. — The Etruscans of old believed in three kinds of lightning: one incapable of doing any injury; another more mischievous in its character, and consequently only to be issued with the consent of a quorum of twelve gods; and a third carrying mischief in its train, and for which a regular decree was required from the highest divinities in the Etruscan skies. Curiously enough, modern scientists, following the lead taken by Arago, have also decreed that the varieties of lightning are threefold. The first comprehends that in which the discharge appears like a long, luminous line, bent into angles and zigzags, and varying in complexion from white to blue, purple, or red. This kind is known as forked-lightning, because it sometimes divides into two or more branches before reaching the earth. The second differs from the first in the range of surface over which the flash is diffused. From this circumstance the discharge is designated sheet-lightning. The third class differs so widely from the more ordinary manifestations that many meteorologists have denied their right to be treated as legitimate lightnings. They neither assume the form of long lines on the one hand nor sheets of flame on the other, but exhibit themselves as balls or globular lumps of fire. A very singular story is told concerning the vagaries of one mass of globe-lightning. A tailor in the Rue St. Jacques, in the neighborhood of the Val de Grace, was getting his dinner one day during a thunder-storm when he heard a loud clap, and soon the chimney-board fell down and a globe of fire as big as a child's head came out quietly and moved slowly about the room at a small height above the floor. The spectator, in conversation afterwards with M. Rabinet of the Académie des Sciences, said it looked like a good-sized kitten rolled up into a ball and moving without showing its paws. It was bright and shining, yet he felt no sensation of heat. The globe came near his feet, but by moving them aside he avoided the contact. After trying several excursions in different directions, it rose vertically to the height of his head—which he threw back to prevent it touching him—steered towards a hole in the chimney above the mantelpiece, and made its way into the flue. "Shortly afterwards, when I supposed it had had time to reach the top," the tailor said, "there was a terrible explosion, which destroyed the upper part of the chimney and threw the fragments onto the roofs of some adjoining buildings, which they broke through." In the forest of Nemours a tree was once struck; two pieces were rent from its trunk; the smaller was tossed to a distance of fifty feet, and the larger, which eighteen men could not move, to a distance of twenty feet or so in an opposite tack. In 1838 the topgallant mast of H. M. S. "Rodney" was hit by a flash and literally cut up into chips, the sea being strewn with the fragments as if the carpenters had been sweeping their shavings overboard. Shortly before, the top-masts of H. M. S. "Hyacinth" had suffered in a similar manner; and when the "Thetis" underwent a like visitation in Rio Harbor, Captain Fitzroy described the foretop-mast as "a mere collection of long splinters, almost like reeds." These are a few of the examples of the mechanical effects of lightning. It works chemically as well. It has the power of developing a peculiar odor, which has been variously compared to that of phosphorus, nitrous gas and most frequently burning sulphur. Wafer mentions a storm on the Isthmus of Darien which diffused such a sulphurous stench through the atmosphere that he and his marauding companions could scarcely draw their breath, particularly when they plunged into the wood. The magnetic effects produced are often very curious. A chest containing a large assortment of knives, forks and other cutlery was, not many years ago, struck in the house of a Wakefield tradesman, and magnetism imparted to the whole of the articles. Arago, in his "Meteorological Essays," speaks of a shoemaker in Swabia whose tools were thus treated, to his indescribable annoyance. "He had to be constantly freeing his hammer, pincers and knife from his nails, needles and awls, which were constantly getting caught by them as they lay together on the bench." The same authority knew of a Genoese ship which was wrecked near Algiers in consequence of some pranks played by lightning among the compasses, the captain innocently supposing that he was sailing towards the north, when, as a matter-of-fact, he was steering due south. — *Chambers's Journal*.

CLEOPATRA'S STATUE. — About two miles east of Alexandria is the plain of Eleusis, now a salt-marsh and shallow lake, the result of subsidence of the soil, which at some remote period is believed to have occurred over a large area in the neighborhood of Alexandria. In old times there stood on this plain a temple to Ceres Proserpina, in front of which were placed, as described by ancient writers, colossal statues of Mark Antony and Cleopatra, the former represented as the god Osiris and the latter as the goddess Isis. These statues are described by Mahmud Falaky, an Egyptian astronomer and savant, in his book, published twenty years ago, on "Ancient Alexandria." He had seen them ten years previously when making researches to find the Canopic road and to get material to be used by the late Emperor Napoleon in his "Vie de César." Since that time they had disappeared, probably covered over again during the levelling of the ground for cultivation. Daninos Pasha, an energetic local archaeologist, lately began excavations, and at a spot strewn with large numbers of granite blocks and columns found, as he believes, the remains of the temple. Close by he dug out a much-mutilated colossal statue in gray granite representing the head and torso of a woman wearing the insignia and coiffure of Isis. The nose is mutilated, but the prominent eyes, the contour of the cheek, and the firm rounded chin show the characteristic traits of the Ptolemies. The head alone is more than a metre high. The sculpture is of high order and finish, probably the work of an able Greek artist. A large detached fragment represents a portion of a man's right hand, the thumb grasping the fingers of a female hand, which are of proportions corresponding to those of the statue. Daninos Pasha identifies his find as certainly the statue of Cleopatra, and considers it to be probably a portrait statue of the famous Queen. If so, it is unique and of very great interest. He is continuing the search for the companion statue of Mark Antony, which is believed to have been removed to a considerable distance, thrown into a hole, and covered up.

If the search should be successful, these two statues will be among the most valuable and interesting relics of ancient Alexandria. — *London Times, Cairo Correspondent*.

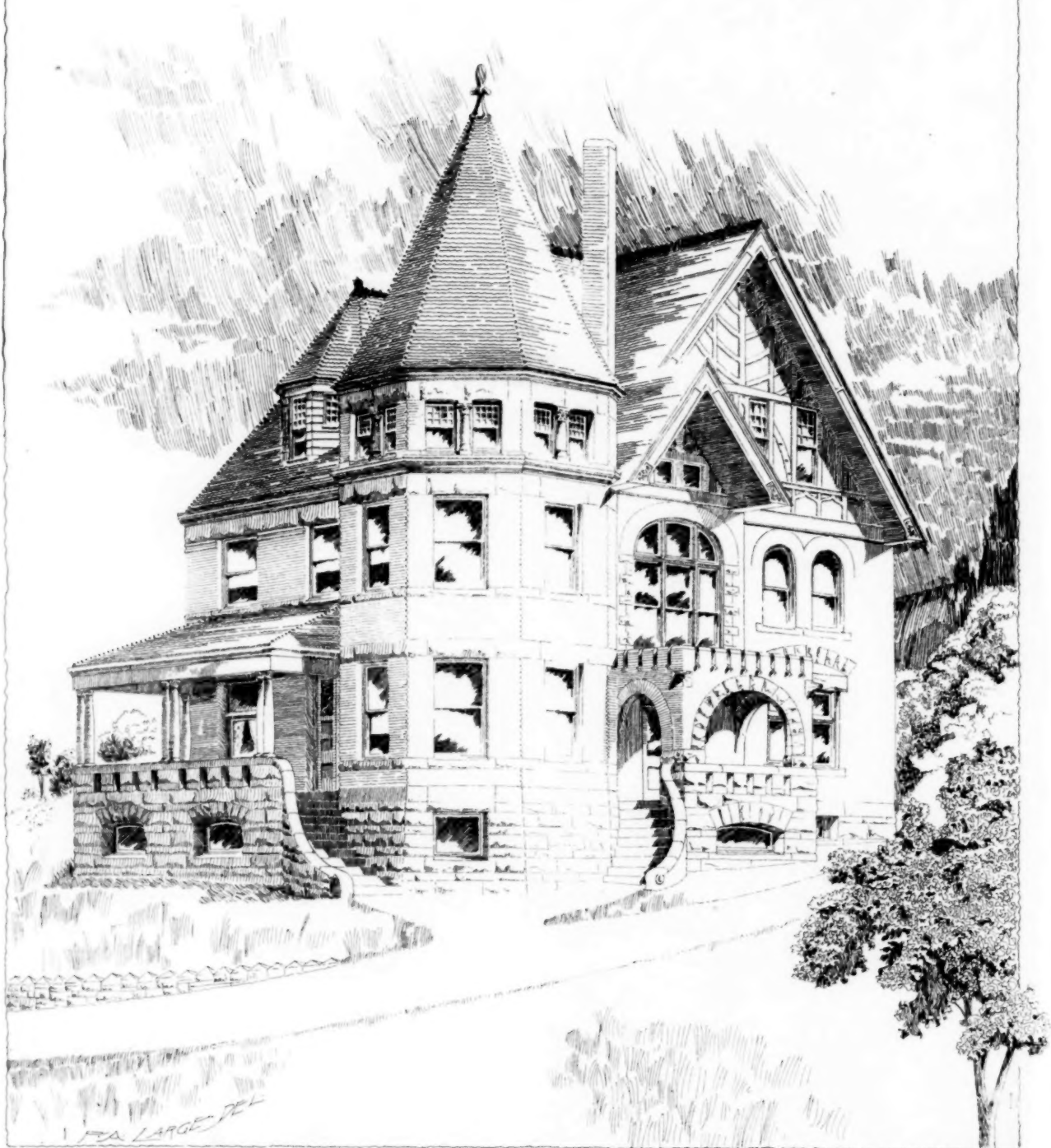
A SAILOR'S SIGN-POST. — A tourist on the southern shores of Ireland reports having found near Waterford a strange decoration for one of the great white pillars erected on the cliffs as guides for mariners. This is a metal figure of a sailor about 12 feet high, with outstretched arm, pointing to the rocks that are a menace to shipping. As there is no bell nor horn nor light, the metal man is of no sort of use when ships are most in danger, namely, in fogs and at night. The tourist was informed that no one knows the origin of this statue. — *New York Times*.

TRADE SURVEYS

WRITERS ON financial, commercial and general industrial affairs on both sides of the water, but especially on the other side, have for some months past spent a good deal of ingenious argument in attempting to establish the conclusion that the business world is nearing a stepping-stone to higher activity in all departments of work and progress. The arguments adduced are interesting, to say the least. The statistics and comparisons with former decades appear to warrant the inferences drawn. Rapid as has been the progress of the world in industries and commerce during the past twenty or twenty-five years, the conclusions of these writers are that the conditions fully warrant them in saying that a much greater degree of progress will be made in the near future. There is very little pessimistic writing at present. Among the conclusions drawn are these: that prices are likely to remain low for almost all kinds of commodities; that the capacity of machinery and all mechanical appliances for the production of power will increase very rapidly in the next few years; that railroad work and ship-building will also expand, out of former proportions; that newer countries will be opened up by capital and enterprise, and that emigration will assume larger proportions than ever. Another inference drawn which may be altogether imaginary, but deserves mention, is, namely, that combinations of capital will be formed for the carrying out of the greater coming enterprises. It is impossible to say how much of this argument is based upon actual or probable conditions, or is the result of mere smart theorizing. On our own side, it is found that opinions like these are held in very high quarters, particularly among those interested in railroad expansion and in the lending of money. New York financiers are particularly gratified at some of the recent developments in the way of expansion of trade and business. They point to the large resources in money, and argue that the extremely low prices of material of all kinds will stimulate enterprise, rather than discourage it. For many years enterprise did wonderful things, but under advancing prices and high margins. The next era of activity will be under low prices and narrow margins. An authority in ship-building on this side states very confidently that every indication to-day points to a very great expansion of ship-building and lake-building work. It is an ascertained fact that the contracts for tonnage on ocean and lake at this time are considerably in excess of any former time. It is also known that a very large amount of railroad equipment work will soon be given out, in accordance with a quite general determination reached by railroad managers to equip their properties and put them upon a more substantial basis. Looking in other directions, it is not difficult to see evidences of a greater expansion of trade. Not a single industry has been distinctly overdone. Even the iron trade is in excellent condition, despite the fact that almost twenty per cent of crude capacity is idle at this time. In the industries wherein iron and steel enter as raw materials, such as manufacturing establishments, machine-shops, etc., there is no idleness, and no prospect of any for months to come. Labor is as fully employed at this time as it has been for five years. Wages are lower, but the earning power of money is slightly increased. The complaints which the agricultural interests made a few years ago concerning the low purchasing power of wheat has been in part removed, and, while the farmers are not exchanging their wheat according to their views for its full value, they are getting more this year for their farm products than in any former year. In other words, an equalization is going on in values by which commodities are more evenly exchanged. It is this fact which economists declare is the basis for the coming expansion, which ever it be, great or small. It would be useless to go into the history of prices and of industries to show how, in years past, unequal exchanges have been made of products; how one product sold for much more than it was relatively worth than another; how the unequal development of our industries placed the community at a disadvantage, being obliged to pay much more for one thing than another. These evils or drawbacks have nearly all disappeared. The price of labor has been pretty well equalized. The interest on money has been reduced; the volume has been increased. Industries have been scattered all over the United States. The same diversification of interests has been brought about in foreign countries. Carelessly speaking, a couple hundred millions of people have, within the past ten years, been brought within the reach of London, Liverpool, New York and continental exporting cities. This process of centering the commerce of the world at our great seaports is rapidly growing. It means a good deal more than it appears to mean on the surface. It is this fact which is another basis for the anticipation above referred to; namely, the great expansion of trade in the near future. The anticipations of the wise business men of the world may be too great, but, viewing the matter in a conservative spirit, it is certainly reasonable to conclude that causes are at work in this and all other countries which will, in a few years at farthest, very greatly expand the volume of business, increase capital in manufactures and greater agricultural activity. At this time, prices seem to be at a standstill on both sides of the water. Buyers and sellers have lost interest in future probabilities. Production is under excellent control. The fear of the probability of overstocking markets is now at a minimum. The steady decline in the number and volume of commercial failures is a most favorable evidence of improvement. There are some serious problems confronting the managers of the world's business, but they are not of such magnitude or character as to justify fears or anticipations of serious disaster. The science of business, so to speak, is better understood. Organization has taken the place of blind effort. Requirements are now known where heretofore they were guessed at. Vast fields are being opened up in new parts of the world which invite capital and enterprise, and it is in these new directions that the younger brains of the commercial world will find profitable fields for activity.

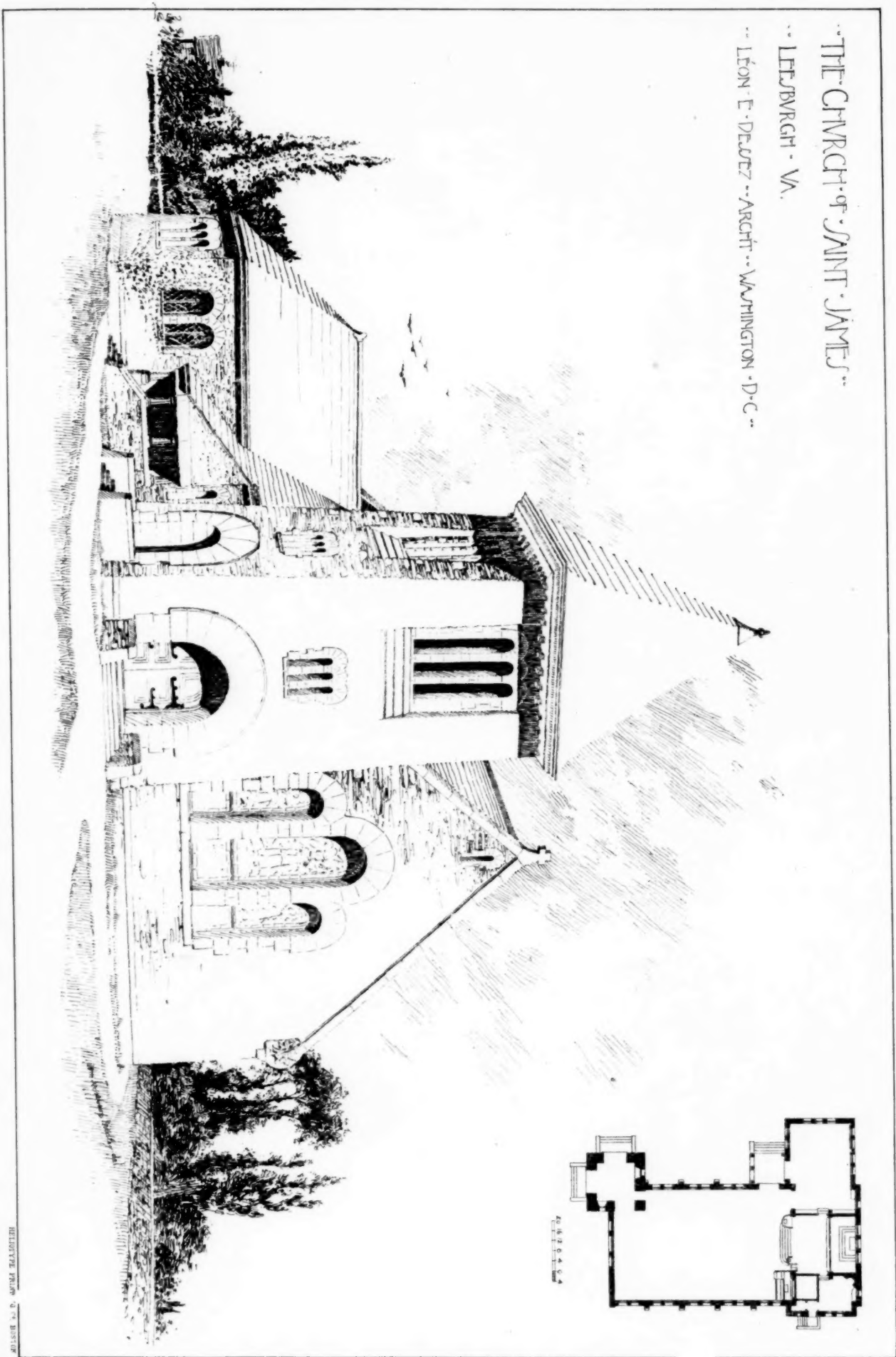
Residence of G. WALLYN, M.D.
TORBES AVE. PITTSBURGH, PENNA.

S. T. MCCLARREN, ARCHITECT.
Westphalia Building, Pittsburgh.



COPYRIGHT 1892 BY TICKNER & CO

THE CHURCH OF SAINT JAMES.
LEESBURG, VA.
LÉON F. DESJES, ARCHT., WASHINGTON, D.C.



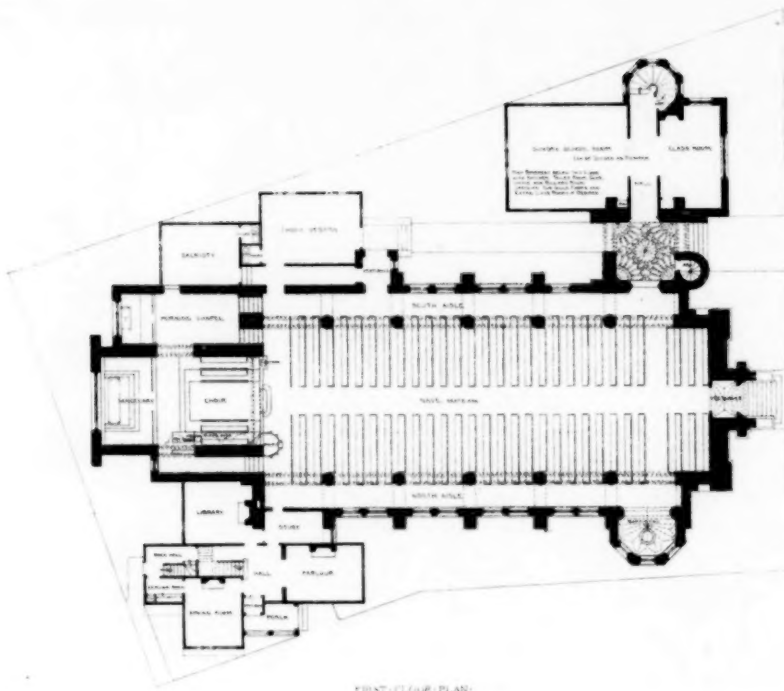


COMPETITIVE DESIGN FOR
WORLD'S FAIR BUILDING

John Parkinson Arch't
SEATTLE







FIRST FLOOR PLAN





• NEW • CHVRCH • ST • PAUL'S • BROCKTON •

• CRAM • WENTWORTH • & • GOODHVE •
• ARCHITECTS •

