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MAY 30, 1891.



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THE attack of the New York walking-delegates upon the lumber-dealers appears to have met with complete defeat.

The action of the dealers, who combined in self-defence, in stopping delivery of lumber in the district reigned over by the delegates, threw about a hundred and fifty thousand men out of employment, and the autocrats were quickly forced to yield. An offer was made, and accepted by the dealers, removing the boycott against a certain dealer which caused all the trouble, and the delivery of lumber was ordered to begin again as usual. The delegates, however, desired to reduce their proposition to writing, and, when opened, it was found that a new condition had been inserted, to the effect that all non-union men should be discharged from the yards. The lumber-dealers immediately rejected this proposition, and countermanded the orders for delivery, and the delegates then surrendered without further dodging, the only stipulation made being one to which the lumber-dealers have not yet agreed, that future differences, until July 6 next, should be settled by a board of arbitration, composed of three members of the Lumber Dealers' Association, and three of the Board of Walking-Delegates. We hope that this may end the struggle which has taught both sides that the trade-unions can exercise their power with impunity only against individuals, and that a combination of employers can defeat with tolerable certainty the manœuvres of the labor leaders. The first contest in which this was made to appear, was that brought on by the attack on certain brickmakers last year. The combination formed by the brickmakers to resist was incomplete, and the struggle was prolonged on that account, but the victory remained at last with the employers. This year, the lumber-dealers have profited by the brickmakers' experience, and have acted more energetically, and repelled the attack much more quickly and thoroughly. We may be sure that the lesson will not be lost in New York, and that the time is nearly over when a manufacturer or dealer can be compelled to creep humbly before the Board of Walking-Delegates, to apologize for having refused an insolent bully permission to inspect his shop, and to offer himself and his business to the unrestricted supervision of the bully and his friends.

WE mentioned the other day the decision by which some stained-glass windows for churches, which were entered at the custom house as "pictures," were made to pay duty as manufactures of glass. Since then, this question, which is of much importance to church corporations, and to

others interested in ecclesiastical architecture, has been discussed by the Attorney-General, who, finding that the considerations involved are not free from doubt, has advised that they should be referred to the Supreme Court of the United States, which will give a final decision as soon as the case can be reached.

A VERY good illustration of the fact to which we have so often called attention, that the Government authorities of the United States have no deep antipathy to good artists, or to good art, but that they do not know how to interest the one, or get the other, is to be found in the recent discussions between the Treasury Department and certain sculptors. It is proposed to remodel the coinage, and, with most praiseworthy intention, the officials of the mint issued circular invitations to some two thousand artists of various degree. Circulars were sent, accordingly, to, amongst others, Messrs. Augustus St. Gaudens, J. Q. A. Ward, Daniel C. French, Olin L. Warner, Hubert Adams, Charles I. Niehaus, Miller McMonnier, Kenyon Cox, Will I. Low, and H. S. Mowbray, and Miss Louisa Lawson, inviting them to submit designs. The terms offered by the circular were unsatisfactory, as is, we believe, invariably the case where such invitations are drawn up without professional aid, and the artists mentioned immediately joined in returning a very sensible letter, declining the invitation on the ground that the terms of competition proposed were "such to preclude the possibility of any good result from it," for the reason that the time given for the preparation of the sketches was too short, and the compensation altogether insufficient, while no assurance was given as to who would make the awards. The letter concluded by suggesting terms of competition which they would consider acceptable, these being, briefly, (1) that the awards should be made by a jury of competent artists of standing in the profession, to be chosen by vote of the competitors, by the presidents of the great art institutions, or otherwise; (2) that at least three months should be allowed for the production of sketch-designs, and at least six months for the production of completed models, if these are to be insisted upon; (3) that one hundred dollars should be paid to each artist competing for each sketch-design submitted, or five hundred dollars for each completed model accepted; and (4) that one thousand dollars, in addition to the sum paid for the competition sketch or model, should be paid for each completed model finally accepted. Besides this, the artists proposed that the obverse and reverse of any coin should be designed by the same artist, and that the reverse of the present silver coins should be abandoned.

ALL these artists, whose opinion deserves attention, signed the letter, except Messrs. Ward and Warner, who were absent from New York, Miss Lawson, and Mr. McMonnier, who had already sent an individual reply. It is much to be hoped that the Treasury officials will receive the suggestions of the sculptors in the same spirit of courtesy in which they were made, and will modify their action in accordance with them. All artists will agree that the price asked by the sculptors for their work is moderate enough, and that the other propositions which they make are perfectly fair and reasonable. The Treasury officers, the public, and the sculptors themselves, are in entire accord as to the object to be gained, which is simply to make our new coinage the most beautiful that American skill and talent can produce. This is certainly a noble scheme, which does credit to those who devised it, and nothing should be allowed to stand in the way of carrying it out. To this day, the common silver coins which the Greeks carried about in their pockets twenty-five hundred years ago are, perhaps, the most instructive objects of the sculptor's art in existence, and to possess and study one of them is almost an artistic education. There is no reason why our new American coins should not be as precious as those of Magna Græcia, if we are willing to find out, and follow, the proper way to make them so. This way is not to hire cheap designers, or to get makeshift models dashed off in a hurry, but to employ the best artists in the country to devote time enough to the work to produce something worthy of themselves, and both to encourage them and incite them to do their best, by putting the award in the hands of the judges for whose opinion they have the highest respect. If these conditions can be fulfilled, we may promise ourselves

very great pleasure in the new coinage. The expenditure of a couple of thousand dollars more or less on the design is insignificant compared with the result to be attained. Let any one look at the silver coins in his pocket, and ask himself how much more pleasure he would annually derive from handling little bas-reliefs by St. Gaudens, Warner, Niehaus and the rest, in place of eagles and wreaths of cornstalks. Suppose, to put a modest valuation on the æsthetic enjoyments of the ordinary American citizen, that the average pleasure and educational profit to be obtained in this way is worth one cent a year for each person. At this rate, the value of good designs over bad ones will be, for the whole country, about six hundred and fifty thousand dollars a year, and, supposing the dies to last twenty years, we shall have profited to the extent of thirteen million dollars by an expenditure which will have been reimbursed, in the same equivalents, in about a day.

THE Government, although special inspectors have just been sent to the public timber-lands, appear to have been hardly yet awakened to the immense and pressing importance of doing something to check the destruction of our forests. Within a generation, the United States, from one of the most richly wooded countries in the world, has become comparatively sparsely provided with timber; yet, such is the force of the habits handed down from our grandfathers, who supposed that the forests among which they dwelt were inexhaustible, that we still see our small remaining area of timber-land diminishing day by day, partly under the axes of reckless lumbermen, and partly through the gigantic forest fires, whose smoke obscures the sun over half the continent for weeks in every year; while in Germany, which at this moment possesses a forest area much larger, in proportion to its population, than the United States, firewood is sold, in the cities, by the pound, all the forests are guarded by State officers, thoroughly educated for the purpose, the underbrush is kept cleared away, to prevent fires, the cutting of timber is restricted to a limited number of mature trees to the acre, so that the supply shall be kept constant, and no timber, except a little oak of specially beautiful grain, is sent out of the country; while the United States, out of a smaller reserve, exports timber to the value of more than five hundred thousand dollars a week. The end of this way of treating the splendid provision which Nature made for us is easily to be seen. Within a few years there will be a timber famine in the United States. It is true that the Canadian forests will supply us with spruce for a considerable period, but Canadian spruce, at a high price, will not seem to the Pennsylvania farmers a favorable exchange for the unrivalled white pine which their fathers chopped and burned and destroyed so energetically; and still less will it commend itself to the people of the future great cities of Texas, as a substitute for the Georgia pine which they could once get so easily and cheaply.

WE do not realize how imperatively necessary a supply of wood is, or how little we have left to satisfy our increasing needs. The forest area of the United States has long ago been settled as thickly as it is likely to be, and the tendency of population is now strongly toward the treeless, though fertile lands of Kansas, Texas, Nebraska, Colorado and Montana. The people who settle in those States must have houses, and must have timber to build them with, and the railroads which serve them must have perennial supplies of ties. For all these needs wood must be had, even if it is brought from the ends of the earth. We have known building timber to be sent from Boston to Zanzibar, and from New York to Buenos Ayres, and we may rest assured that when our stock is exhausted we shall have to buy more, and shall have to pay the people who have it whatever price they choose to ask for it. So far, the steps which have been taken by the public authority to check the annihilation of the forest wealth of the country have been hardly more than the feeblest demonstrations of a consciousness of the evil against which they were directed. Something has been done to encourage tree-planting by settlers, under the so-called Timber-Culture laws, which provide that a settler who cultivates trees on one-sixteenth of his homestead claim shall receive his patent in three years, instead of five, but this is a mere trifle, and the unwillingness of Congress to do anything of serious practical significance is curiously shown by the law adopted at the last session, in which it was declared that it is "important to reserve all public lands bearing forests, or covered with timber or undergrowth, on which the timber is not absolutely required for the legitimate use and necessities

of the residents of the State or Territory in which the lands are situated." It need hardly be pointed out that "the legitimate use and necessities of the residents" in the neighborhood of Government timber lands have generally required them to plunder and denude the lands to their hearts' content, and will be likely to continue to do so, until some much more forcible language than this is used in the public statutes, and officers are assigned to see that the statutes are complied with; and even then, in our opinion, little will be accomplished toward restoring the balance between the production and consumption of timber until private plantations, as well as natural forests, are brought under official supervision. It is well known that, in the Eastern States, pine trees are now extensively planted, but the work is done by individuals, with small resources, and still less knowledge of the proper management of their infant forests. There is no reason why expert officers of the Government should not be detailed to assist in this very important work, and to combine the efforts of a large number of proprietors. There would, obviously, be a great difference, at the end of twenty years, between the pine timber on a thousand acres of land, belonging to different estates, but all planted and managed together, under skilful direction, and that on an equal area, divided into a hundred scattered clumps, planted at random, and left to grow or perish as circumstances might dictate; yet the cost of one method of cultivation would be hardly larger than that of the other, and the shrewd farmers of the New England States, at least, could be depended upon to appreciate the advantages of the combined and well-directed effort. If such facilities for increasing the profit of timber culture were afforded by the public authority, nearly all the waste land, now overgrown with weeds and worthless "scrub," which occupies an immense area in the Eastern States, could be made valuable to its owners; and the Federal officers, or even those of the individual States, might be empowered to take possession of and plant such waste lands as the owners neglected to improve, and to retain them long enough to secure reimbursement, from their products, for all expenses incurred, before turning them over, in the shape of valuable and productive property, to their owners. To put a stop to forest fires, which not only form one of the principal agents of the destruction of the standing timber now in existence, but the dread of which is perhaps the principal obstacle in the way of inducing farmers to plant forest trees on their exhausted lands, an efficient means would be, it seems to us, to make every man responsible for losses by forest fires proved to have originated on his land, railroad companies, as now, assuming the liability for all fires caused by sparks from their cars or locomotives. It is tolerably well settled that if underbrush is kept cleared away, there is little danger from forest fires, and, with such a regulation, which would be a thoroughly just and fair one, every man who owned timber land would be constantly on the lookout, not only to see that his own territory was free from undergrowth, which might make him liable to his neighbors, but to note those of his neighbors who allowed the "scrub" to grow, so as to have good evidence against them in case of a destructive fire. Such mutual supervision would be infinitely more effective in promoting the proper care of forests in this respect than the occasional visits of an officer, and it would cost the public nothing, while the persons chiefly interested would be amply rewarded for their trouble by the improved growth of their trees.

ACCORDING to *La Semaine des Constructeurs*, an important archæological discovery has been made at Aubagne, near Marseilles, where some workmen, engaged in digging a trench, struck with their picks the ridge of a small structure, which, by order of the owner, was soon laid bare, and proved to be a little temple, about twenty-three feet long, and twenty feet high, evidently of Roman workmanship, and strongly resembling in style the famous *Maison Carrée* of Nîmes, which is not far away. In the interior of the temple was found a very beautiful statue of Diana, and several sculptured fragments, which were collected, and carried to a house in the neighborhood, to await an opportunity for transporting them to the Museum at Marseilles. One of the fragments bore an inscription, of which only parts remained, these forming the letters,

TRI . . . Æ . . . SYLV . . . ERE.

So far, no one appears to have been able to supply the missing letters, and perhaps some of our readers would like to try their skill at guessing them.

SPANISH ARCHITECTURE.¹—I.

Fig. 1. Cathedral of Murcia.

THE history of Spanish architecture is very complicated, owing to the influence of political events which at three different times placed the government of the country in foreign hands. This history may then be divided into four sections, the first covering the Roman period; the second, the period of barbarian invasions (Goths and Visigoths); the third, the period of the conquest and of Moorish rule in the provinces subjugated by the Arabs; the last includes the history of architecture in those provinces that remained independent, from the Arab invasion to the sixteenth century; then from this latter date, in all Spain, down to the present day. Two of these periods, the second and the fourth, form the subject of the following sketch.

At the time of the barbarian invasion of Spain (A. D. 411) ancient architecture was already in complete decadence and the monuments which were then reared in the Iberian Peninsula were, as in all the other Mediterranean provinces of the Empire, more or less strongly marked with the impress of the arts of the Orient. This influence may certainly be attributed in a great degree to the establishment of the imperial capital at Byzantium, but it is perhaps even more largely due to the pilgrimages which Christians of all conditions were in the habit of making to sacred places, and to the more or less successful imitation of the architectural forms in use in Palestine and Syria.

In general, scarcely anything more than mere vestiges of the churches, basilicas or convents of that epoch have been preserved, and in Spain, as in the north of Africa, as well as in Southern Italy and Sicily, we find not only multifold analogies in the composition of plan and *ensemble*, but also of the details which seem copied out and out from the same models. To cite but one example, the same decoration is found repeated, in absolutely the same form, in a Syrian church (at Serdjilla), in the Spanish collegiate church at Covadonga (Concejo de Cangas de Onis), in the church of St. John at Baños (province of Palencia) and in Africa, in the churches of Bir-Oum-Ali and Henchir-es-Sdid. It is very interesting to determine the unity of style displayed in the monuments of the fifth to the seventh century over this broad extent of territory. There are, nevertheless, notwithstanding their common source of inspiration,

notable differences of detail in the dispositions adopted, and the Spanish plans, while retaining the basilican form, are more elongated than the Syrian or African. Down to the ninth century, this school continued to flourish in Spain, in those provinces which escaped the Arab conquest, and it was only in the eleventh century that edifices began to appear, bearing any likeness to the more ancient French-Romanesque structures. Afterward, with the reconstitution of the Spanish kingdoms, the Arabs were gradually driven back by the Spaniards, while at the same time, they bequeathed numerous motives of their art to their conquerors. Until the fourteenth century, however, the influence of French architecture prevailed and the cathedrals of Burgos (southern front), Salamanca (Tower of the Cock) and Toledo exhibit very fine examples of it.

On the frontiers of the provinces occupied by the Arabs and in those gradually recovered from the invaders by the Spaniards, the so-called *Mudejar* style began to appear in the eleventh century, concurrently with the employment of the architectural forms of the north, which were brought into Spain by numerous artists attracted thither from Germany or Flanders; it reached its zenith in the fifteenth century. The *Mudejar* style may be described as follows; an Arabic ornamentation, decorating an *ensemble*, the conception of which is derived from European architecture (either Gothic or the early period of the Renaissance); these conditions may be found reversed, as in the *Puerta del Perdon* at Seville (sixteenth century), where an Arabic *ensemble* is covered over with Renaissance decorations. In the fifteenth century, the Gothic style was almost exclusively reserved for religious edifices, and the *Mudejar*, parallel with a new style termed *Plateresque*, was more especially employed for civil constructions. We have followed here the classification adopted in official Spanish works on the national monuments, and particularly in the treatise entitled "*Monumentos arquitectonicos de España*." The *Mudejar* style was common in those regions where Arab influence was perpetuated by a people of Arab stock, though converted to Christianity; the *Plateresque* style, on the other hand, was more especially developed in provinces destitute of these traditions; nevertheless, on the borders of the sections subjected to these influences the two styles are noticed side by side. Both possess characteristics of powerful originality, and they are the only styles which are exclusively Spanish. The other monuments of Spain, whether Romanesque, or Gothic, or of the Renaissance, or modern (of the seventeenth and eighteenth centuries), are so slavishly copied from foreign models as to preclude any just claim to originality, although they do exhibit that peculiar character of exuberance and wealth, which is typical of the Spanish art of every period.

It is the adaptation to architecture of forms commonly used in the goldsmith's art that constitutes the distinctive feature of the *Plateresque* style, and hence also its name (*platero*, goldsmith or, more properly, silversmith). In this style broad surfaces, the masses of which are still inspired by Gothic traditions, are covered over with arabesques and ornaments of quite complicated pattern. These decorations are derived from the first Italian Renaissance, but in their abundance they offer a contrast to the somewhat playful soberness of primitive Italian art.

A description of the *Mudejar* style belongs rather to the history of Moorish architecture, where it naturally finds a place as a continuation of Arab art in Spain. We therefore refer our readers to this subject for its study.

The imitation of Italian art was much in vogue among European nations at the moment when, under the energetic hand of the emperor Charles V, the Spanish power reached its zenith; Spain then borrowed all her architectural inspirations from Italy. From this time the constant intercourse naturally maintained between Spain and Italy by the possession of Naples and Sicily, gave prominence to this Italian influence. In the seventeenth century, Spain adopted all the oddities and distortions of Italian architecture, and exaggerated them still more in the eighteenth, ending this period by crudely copying the edifices of Italy which were inspired by the revival of ancient traditions.

The feature which distinguishes Spanish from other contemporary art, in all these different periods, is an exuberance, a burdensomeness, which manifests itself even in the productions of Moorish art. Decorations are distributed in profusion everywhere, the dimensions of the structures are oftentimes colossal, and we can truthfully liken this exaggeration of effects to the proverbial magniloquence of the national literature. Spanish

¹From the French of H. Saladin, in Planat's "*Encyclopédie de l'Architecture et de la Construction*."

architecture exhibits this same pompous character in the Middle Ages, in the Renaissance, and in modern times; to cite the numerous examples of it would be to pass in review nearly all the monuments of the country. It is this Spanish disposition to do things on a grand scale and seek effect that has given their architecture that theatrical aspect which is so characteristic of it, and of which two remarkable types are given here: the façade of the Cathedral of Murcia, (Figure 1) and the Puerta del Palau at Valencia (Figure 2). The architectural composition is reduced to the rôle of simulating a decoration, without indicating any disposition which might be expressive of a mode of construction or of some office or purpose. However, in the important edifices of the fifteenth century, in the

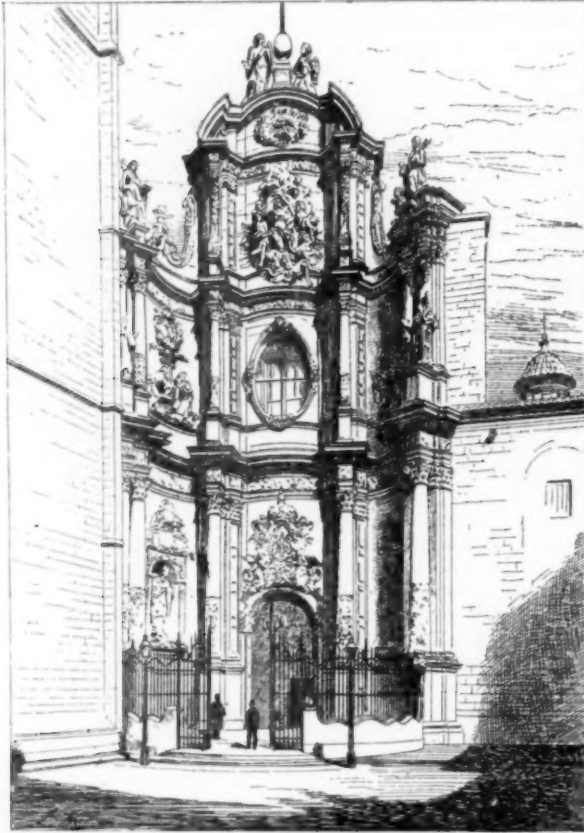


Fig. 2. Puerta del Palau, Cathedral at Valencia.

great cathedrals of Burgos and Toledo, the Spanish architects succeeded in producing marvellous effects of grandeur and majesty.

By the great wealth of ornamentation lavished upon the sanctuaries, the choir walls, the altars and altar-screens they gave to the religious expression of their works a sense of vastness, vagueness and weight analogous it seems to me, to the sentiment which the Hindus have introduced into their religious architecture; but they succeeded, at the same time, in imparting an almost idolatrous character to their monuments, in which they differed greatly from our French architects of the Middle Ages and the Renaissance, whose productions bear the stamp of the loftiest religious feeling. In civil architecture this opulence, on the other hand, displays a peculiar character of grandeur and nobility, which appears in a measure to reflect the national pride and haughtiness. The palace of Monterey, the Casa de las Conchas and the University at Salamanca, the Alcazar of Toledo, the Palace del Infantado at Guadalajara, the Casa del Cordón at Burgos, the Casa de los Momos at Zamora, the municipal buildings and Exchange at Saragossa are the best known specimens of this majestic and sumptuous architecture; we omit from the list the Escorial, whose sombreness and isolation give it much more the character of a religious establishment.

We will rapidly review the monumental history of Spain, pointing out in the various examples cited the characteristics which we have briefly touched upon in the foregoing paragraphs.

It is necessary to indicate precisely, by dates, the period

into which the history of Spain is naturally divided; we can in this way follow the development and vicissitudes of the arts in connection with the political changes:

Conquest of the Goths, 409-584; Hispano-Latin kingdom, 584-711.

Moorish conquest, 711.

Christian kingdoms of Navarre and Arragon established, 760. Kingdoms of Castile established, 1005.

All northern Spain united into one kingdom, 1072.

Toledo conquered from the Arabs, 1226.

Conquest of Valencia, 1238.

Conquest of Seville and Murcia, 1243.

St. Ferdinand died, 1252.

Alphonso the Wise, 1252-1284.

Peter the Cruel (Alcazar of Seville), 1350-1369.

Ferdinand and Isabella, 1474-1516.

Conquest of Granada, 1492.

Charles V and his successors. Influence of Italy in the sixteenth, seventeenth and eighteenth centuries.

The first period of Spanish architecture, which we will term the Latin-Byzantine, to indicate the dual source of its style, is full of interest. Unfortunately, although its remains are comparatively numerous, the written documents necessary to an accurate chronological classification of them are wanting. It is, however, probable that the fragments of the Metropolitan atrium, the baptistery and the basilica of Merida are among the most ancient.

The sculpturing of the capitals and bases points to an indifferently skilful imitation of the monuments of the Roman period; we find, on the contrary, in the frieze decorations, in the walls adorned with pilasters, and, generally, in the embellishment of flat surfaces, an adaptation of Oriental forms, the essential element of which consists in the application of geometrical outlines to a running ornamentation. Not that an art can be seen developing here analogous to Arabian art, which created, by means of geometric elements, such a homogeneous and characteristic *ensemble*; but these designs are not without a certain originality, and their execution has many points in common with Byzantine, Syrian and Arabian decoration. It is quite probable that textile fabrics imported from the East may have furnished the linear theme, and as for the mode of execution, it must have been suggested by movable articles in carved wood or stone. A striking indication of this may be seen in the little Jewish ossuaries of the Judaical museum in the Louvre, or in the delicate objects in carved wood which the Kabyles of Algeria skilfully cover over with decorations cut into the surface, such as spoon-handles, folding-desks, small articles of furniture and even the moulds used in shaping bread and cakes.

The church and cloister of St. Peter and St. Paul at Barcelona offer a comparatively late type of the edifices of this period; the remarkable arrangement of the doorway (Figure 3) exhibits, in the lintel and the long consoles which serve as

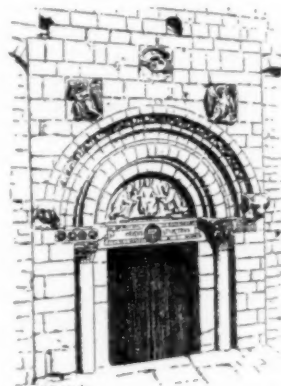


Fig. 3. Doorway from San Pablo at Barcelona.

imposts to the arch, the characteristic decorative features of the style. The disposition of the impost consoles is very peculiar, and it is this particular example that has furnished me the key to the design of numerous similar constructions which I have discovered in the ruins of churches in Tunis belonging to the second Christian period. The simplicity of the arrangement bears a considerable analogy to certain dispositions in Arabic monuments of the eighth century, erected at a time when the traditions of the preceding periods were still in the fulness of their force.

San Juan, at Baños (province of Palencia) presents another interesting example of this style; the quatrefoil disposed on horizontal friezes is employed here. It is found also at the same time in Syria and in Africa.

At San Miguel-de-Escalada (Ayuntamiento de Gradefes), carved paving-stones of this period are to be seen, the work on which is inspired to such a degree by the arts of the East as to appear almost Arabic.

In the province of Oviedo, the Church of Santa Maria de Naranco (Figure 4) dates from the close of the ninth century, and is supposed to be the palace of King Ramiro, converted into a place of worship in the tenth century. There are tombs in it of the same period. It is constructed with numerous slightly projecting buttresses, and its characteristic lateral façades cannot be better compared than with the Sassanid edifices of Mesopotamia. We, therefore, encounter that Oriental influence which passed from Ctesiphon to Rabbat-Ammân and Kasr-Machiita, to be developed afterward in Syria and Hauran, where, coming in contact with Greek and Roman influences, it formed the mixed style to which the Christian monuments of Syria and Africa during the fifth, sixth and

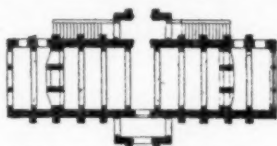


Fig. 4. Santa Maria de Naranco.

seventh centuries were due. San Adrian de Tuño (Concejo de Villaneuva) may be attributed to the same period.

The hermitage of Santa Cristina (Concejo de la Pola de Lena) approaches more nearly to the Romanesque: it comprises a rectangular nave terminating in a lofty space, which serves as a place for the altar; an anterior portion may be considered as representing what we may term the narthex in the Church of Santa Maria de Naranco. The walls are pierced in the centre with four broad entrances, preceded by square rooms, of which the one in front of the narthex is a sort of vestibule. The edifice then presents a cruciform plan. It is cantoned with heavy buttresses, and both the barrel-vault and the groined vault are employed; the remains of the basilica of Guarrazar are of the same period, and it may not be out of place here to call attention to the votive crowns, known as the "treasure of Guarrazar," now in the Musée de Cluny. The exquisite character and workmanship of these offerings show what a marked difference existed between the civilization of Spain under the rule of the Visigoths and the barbarism of France under the Merovingians. At Toledo, there are numerous fragments of Christian sarcophagi which exhibit specimens of Latin-Byzantine decoration, and in one of the churches, which the Arabs converted into a mosque, paintings antedating the Moorish conquest have been discovered which bear the Oriental stamp still more than does the sculptural ornamentation. San Salvador de Val de Dios (Concejo de Villaviciosa) belongs to the last of the ninth century. San Salvador de Priesca is of the early part of the tenth century, and it may already be remarked, from the study of these different monuments, that the style in use in the kingdom of Leon is more energetic and simple than that of the monuments of the Asturian monarchy.

The ruins of the church at San Roman de Hornija show striking likenesses to the Christian decorative forms in Africa, as likewise the Church of San Pedro at Navas. No names of the architects of this period have come down to us, unless, indeed, the tradition which attributes the palace of Ramiro, referred to above, to Tioda be correct.

We will also cite the Camara Santa in the Cathedral of Oviedo, the Church of San Miguel de Linio and the Collegiate Church of Covadonga (Concejo de Cangas de Onís); a tomb in the last offers a well-preserved and characteristic example of the mausoleums of this period. It consists of a sarcophagus, richly decorated and borne on three powerful consoles, engaged in a niche, the flat surface of which is embellished with rectilinear ornamentation. The arch, on the contrary, bears quatrefoils similar to those of San Juan de Baños, and forming a broad archivolt.

Numerous remains of this style are still to be seen at Seville, Italica and Nieva.

The works just enumerated include only the most remarkable examples of the Spanish structures of the period preceding the advent of the Romanesque style. The list is, however, sufficiently complete to establish the importance of this school, perpetuating, as it did, in the Spanish provinces not conquered by the Arabs, during and even after the conquest, the traditions of Roman antiquity and the influences of Oriental Christian art; it likewise constituted in the kingdoms of Navarre, Arragon, Castile and Leon a well-defined transition between ancient art and the art of the Middle Ages, the first principles of which were laid down by the architects of the Romanesque era.

[To be continued.]

EMMANUEL FRÉMIET.¹—IX.



Hunting Dogs. Frémiet, Sculptor.

ABOUT art-teaching and the Ecole des Beaux-Arts, Frémiet made these observations: "I never went to the School, and never wanted to, because the teachers in my time were a poor lot, and they treated Rude shamefully. If I had a son who wanted to follow sculpture, I would teach him the methods which I think are the best, such as my master taught me. If my advice were asked by a student of sculpture, I would tell him to choose a good master at the School and go into his studio. Not stay too long. The professors there are able men and understand good methods. This is all I care about saying concerning the School. Rude had a clear and sure method that permitted the student to study easily and pleasantly. He was very exact with nature, and taught perfect precision. He was a great friend of Monge, the geometrician, and made his statue for the city of Beaune. Science is an absolute aid in art."

Frémiet is exactly opposite to what Barye was as a friend and teacher of pupils. The latter never was known to say anything to one, except, "O, its all right. Its first-rate. Go ahead." Many years before his death, he said this to an American of very keen art-instincts, who quickly responded, "Excuse me, Mr. Barye, but I don't see that it is all right. It looks to me all wrong." Barye stopped, turned around, looked sharply, and somewhat surprised at his pupil, but no wise disconcerted, and then added, "Very well. All you have got to do is to keep at and it will come all right. Go



St. George (Bronze Statuette), Frémiet, Sculptor.

ahead!" Millet had the same self-protecting reticence, with a considerable touch of peasant secretiveness.

He said to Karl Bodmer, who also lived in Barbizon for quite forty years, "Why should we give away to these young fellows the things we have learned by years of hard labor. Let them find out for themselves. If they work hard enough they will find out, if not, its no good to tell them." Frémiet takes the greatest interest in any student who gives evidence of talent, and will go to any pains to help him. Still, it is only the mighty bright ones that can get any real good out of such a master. Being the most distinguished pupil of

¹Continued from No. 804, page 115.

one of the greatest of French sculptors, I think Frémiet takes a special pleasure in the fancy of having a worthy one of his own. The relationship, almost indescribable, between a great master and a pupil equal to his opportunity, has seldom, if ever, had so fine an illustration as that which existed in the case of Rude and Frémiet. How just was the commanding fate that brought them together, and how cruel that which has failed to duplicate it in so many instances.

In what way has the antique helped you? I inquired of Frémiet. "Not much. Very little in fact. I like the horses of the Parthenon and the few pieces of Phidias, the 'Theseus and Ilissus,' especially. They are superb, great every way — masterpieces. I care nothing for other sculpture." This answer surprised me at first, and puzzled me, for it was the first time that I had ever heard from the mouth of a great artist, so complete an expression of indifference to the charms of Renaissance sculpture, and the acknowledgment of so small indebtedness to the Greek.

To the great mass of what is accepted as the "art-world," this declaration is fearful heresy. Not to rely upon the Greek as the highest source of confirmation, to have no care for Signorelli, Donatello and Michael Angelo, and never to mention the vaunted educational value of museums, cannot be interpreted by the above mentioned art-world as anything less than an expression of unpardonable audacity and irreverence.

Most sculptors like the Renaissance, not perhaps as a stopping-place, but as a delightful study, an encouraging observation, a very human art-expression, a great page of true history, — especially

those who study nature thoroughly. In it they see the whole scheme of a grand struggle of sentiment, an adorable tribute to sub-

guided by an absolute reliance upon nature in every respect, in this great part of his work, it was natural enough that I should ask him if he had seen and studied the "three great equestrian statues."

"No," he replied, "I never saw but one of them, the 'Colleoni,' when I was in Venice, in 1885." "Will you tell me what you think of it?" "Yes, I am very glad to give a rap at it. It is a horrid work. It is not a horse. He cannot move. A bad copy of the poorest kind of Roman sculpture. The head of the rider has character, but there is no man in the armor. The position of the armor is forced, unnatural, and stiff. The pose of the whole thing is exaggerated, without movement, and silly. The man especially is disgustingly vain."

In this as in many other art matters there is a decided difference of opinion between a certain class of artists and those who form, or lead, popular judgment. Frémiet is not alone in his condemnation of this generally accepted famous statue. Other artists, though not knowing, in any sense, a thousandth part as much of the subject as he does, have pronounced it lifeless in its pretence of movement, strained in design, and vulgar in execution. There is a reason for it all. The sculptors who made it were not only not the greatest ones of their time, but they knew very little about a horse. A fact evident enough to those who, with any degree of care, have studied horses, and their place in the composition of equestrian statues. It could not be expected that the qualities of the Greek frieze would be found in the first statue of any sculptor of the Renaissance times, even if he had known a great deal about horses and equestrian combinations. The detailed faults of the "Colleoni" are many, and are quite as caustically expressed by its critics, as those just mentioned.

The horse of the Padua statue is criticised because of its bad proportions, its heavy and clumsily modelled hind parts, and its general lack of life. The legs are regarded as especially cold in every respect. Its critics say, that it is evident that its author knew little about



"St. Michael."



"Credo."

Bronze Statuettes, Frémiet, Sculptor.



"St. Cecilia."

jects familiar, tender, symbolic and personal; a beautifully graded growth through generations; the successful expression of what they themselves are struggling for. Not impassive, grand, god-like, like the Greek, but themselves, living, and instinct with emotion.

Neither the tone of Frémiet's nature, the character of his temperament, manner of expression, nor subject treated, bear any special or general relationship to any phase of Renaissance or Greek growth or development. He is independent and self-supporting, needs no encouragement or sympathy from any source, save nature, and from that he has got everything. No one has ever accused him of being inspired by anything else — not only in its general character and inexhaustible suggestiveness, but in its smallest detail.

He uses the plumb-line and calipers without ceasing, and relies upon well selected natural proportions of living models of every kind. He has been extremely fortunate.

In the matter of subjects Frémiet entered, like a lordly knight-errant, fully armed and equipped, into an unexplored realm, where he revelled in compositions of widely varying character. Heroes, warriors and mighty men, standing for races, epochs and ages. Gods in their day. Not to stir emotion, but to be wondered at, to live in space and with the elements. All in repose.

No tenderness, no heart struggle, no present life, telling of conflicts, and the fate of destiny.

Frémiet has made no less than eight large equestrian statues, one, life-size, two half-life, six or more life-size horses, for decorative and other purposes, and dozens upon dozens of statuettes. Far more than any sculptor known in history.

In spite of the fact that I knew well enough that he had been

horses, and copied one for his purpose without any of the sincerity that characterizes his other work. The rider is rather fine, sitting well on a horse that does not move. The head of the latter is also considered fine. Yet, they say, the whole effect is attractive, because it illustrates the charm that a master can give to everything that he touches, even if out of proportion, and carelessly studied. It is for this reason that the best artists regard the "Gattamelata" as much superior to the "Colleoni." Of the latter, it is observed, that a worse example of inferior sculpture never makes a piece of decorative art.

The "Marcus Aurelius" also comes in for a rap. Its movement is said to be heavy, the horse uneven, and thin in execution, in parts, and the left fore-leg straight and stiff. In fact, it is far from being good Greek, if Greek at all. Fault is found with all these statues because they produce no impression of going along, though intended to do so. They urge, push along, heavily, and without concentration in either construction or movement. Showing little knowledge of the horse in any of its multifarious aspects. They are artificial, not natural.

Some artists prefer the "Colleoni" and the "Gattamelata," to the "Marcus Aurelius," though generally admiring the superiority of the pedestal of the latter.

The superiority claimed for Frémiet's equestrian statues over the three great ones, consists of the following points. (1) His horses are living, natural, and of fine type. (2) When they are intended to move, they do so; have moved, are moving, and will continue. (3) They are thoroughly and elegantly constructed, firmly and beautifully modelled. (4) They compose with their riders in every respect, in type, action, proportion, and sympathy, producing a

perfect whole, in character with the subject. (5) Beyond all compare is the elasticity of their outline and action, the "Knight-Errent" and the first "Joan of Arc" being especially notable. Of the statues whose horses stand still, it is affirmed that they fully accord with the varied natures of their subjects, a variety quite as distinct as that shown in the horses that move, the extremes of which are seen in that of the "Saltimbanque" and the "Duke of Orleans." The monumental tranquillity of this statue, and its immense style, are qualities quite sufficient to carry its author into the admiring memory of the age. And what an appropriate place it has the good fortune to occupy! The almost impertinent readiness of the "Gallic chief" presents such a contrast to the "Duke of Orleans," that it requires a stretch of credulity to believe that they were made by the same hand. Serious students of equestrian statues regard these four as incomparably the best ones in the world.

The number of horses that the sculptor has made, the variety of type and character they represent, and the contrasts of color seen in the equestrian statues, is nothing less than amazing. What a gamut of extent and variety for one man to run through, and with such an unwavering and sustained power! It is right to call the statuettes equestrian statues, because they have all the air of large works. To see all the latter is a pilgrimage, which few are likely to undertake, but by placing the photographs of them side by side, a wonderful impression may be obtained. Such illustrious demeanor do they all have! Each in itself, respects its own gravity, like all great sculpture, and fills the nineteenth century with unknown wealth.

It seems unfortunate, judged from the everyday point of view, that neither individually nor collectively, have they brought the sculptor any private or public recognition, in the way of orders, with the exception of that from the Roumanian minister. On many occasions, during the past twenty-five years, have foreign governments, kings, princes and representative committees, including French noblemen, engaged French sculptors to execute equestrian statues, but not one has thought of Frémiet. Considered from one point of view this fact is an admirable and fortunate one, a part of the sculptor's quiet and dignified life.

All of his important works have come into the world for individual and private reasons, executed in the most undisturbed professional peace, and for their real appreciation they have remained individual and private. He has been able to live, not without great difficulty, and bring them into existence—an extraordinary thing for an artist of his genius, even in France. And, so, he has escaped all the annoying intrusions on professional privacy, the vulgar contentions of the art-world, the indescribable ignorance of committees, and the patronizing impertinence of princes.

It is not then from an everyday point of view that Frémiet is to be judged or sympathized with, but from one established by himself and the circumstances that have surrounded him. All things considered, professional and public indifference to such a contribution to the art of the world is not surprising, but that the curious writer on "Horses in Art," and the compilers of books, telling how horses have been and should be represented in art, all of whom have been obliged to rely upon borrowed material, should omit the enjoyment of national pride and boasting over the efforts of a countryman, is both surprising and amusing. In four long, illustrated articles, published in the *Gazette des Beaux-Arts*, by Colonel Duhoussat, under the above comprehensive title, and in which reference is made to about everything concerning horses, from the Greek down, not an indication is given of the existence of Frémiet.

He closes his articles, however, very appropriately, with the commonplace recommendation to students, to study nature.

It is not to be wondered at that there are so few really good equestrian statues. The difficulties to be surmounted even with an artist born with the genius for that branch of sculpture, are enormous, vastly more so than in any other, and quite in keeping with its superior rank. It is very costly, the study of horses, and none but a rich artist can think of undertaking it. Then there is no more public demand for them than there is appreciation. The peculiar superiority of a fine equestrian statue, as a representation of the highest kind of sculpture, and as a work requiring special gifts, is recognized by but a few persons. Custom, the world over, has affirmed the dictum that any one can make a horse, just as our own college professor has said that "any one can make a statue." A few persons have also become convinced, for various reasons, that to make equestrian statues worthy of the name, special gifts are required, even more special than those with which makers of ferocious animals are endowed. Artists so favored by nature are about as rare as the lovers of fine living horses who can see any beauty in a fine horse as represented by a good sculptor. Thinking these things over, and wondering at the long and precious procession of horses Frémiet had made, their almost buried isolation, so far as the world generally was concerned, and the endless amount of study and pleasure they could give to those who may hereafter care for them, I asked the sculptor if he did not think that he had had good luck, in having such an extraordinary opportunity to study horses, and he replied, "Yes, the greatest kind of luck."

There is a difference of opinion as to whether France appreciates her great artists, living or dead. Some say that she does not, and as proof of this, they point to the lives and memories of Rude, Barye, Millet, Corot and many others.

The opposite view is supported by the assertion that all such men "arrive" in their life-time, that is, that they are recognized by the

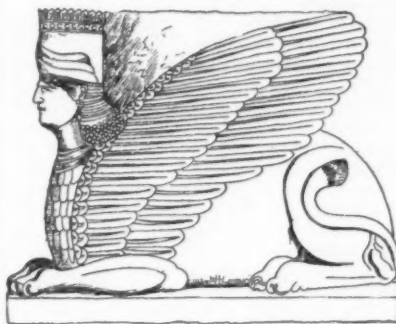
best art-judges as masters, and see in life, or have after death, examples of their work placed in the Luxembourg, or the Louvre. Those who affirm that France has never cared for her great artists, do not regard this as an indication of appreciation, because the same thing is done for inferior artists, and marks no distinction of superiority, due to those of exalted genius. Such men, they say, should have been commissioned by the State to execute important works during their entire lives, receiving generous remuneration, freed from the annoyances of poverty, and permitted to follow their professions in ease and comfort. That would have been appreciation, the fulfilment of a duty owed to them by their country. Frémiet agrees with the last statement. "France cannot appreciate her great artists," he says. "She is loaded down with too many half artists, and to a very ordinary level. It is impossible for her to do anything for grand art; she is obliged to treat high and low alike. No discrimination is made in favor of her best men."

T. H. BARTLETT.

(The end.)

ANCIENT ARCHITECTURE FOR STUDENTS.¹—IX.

DETAILS OF ASSYRIAN ARCHITECTURE.



Assyrian Sphinx. Time of Asshur-bani-pal.

ONE of the most, if not the most disputed point in reference to Assyrian architecture, is the manner in which the buildings were roofed, and also as to how light was admitted.

Fergusson, who is very determined about the truth of his theory, is sure that, in the first place, the inner walls where the rooms are two or three deep, did

not go up to the ceiling, and that the ceiling or roof over the central room, in the case where they are three deep, was raised to a higher level than the roof of the two outer chambers. By this means, he says, light and air were admitted to all three rooms, the inclement weather being easily kept out by means of curtains, which would close up the aperture. The only foundation for such a theory is shown by Rawlinson "to be the occurrence of a single bas-relief, representing in a city in Armenia what is regarded as a similar arrangement, but this is probably merely ornamentation, as there is no proof the spaces were pierced." Layard thinks that possibly the rooms were not roofed over entirely, but that a square or oblong space was left in the centre easily closed by a curtain or awning, observing that the flat roofs on beams are laid, to this day, in Mesopotamia, over a space almost equal to that of Assyrian halls. Herein Rawlinson partly agrees with him, because great timbers sufficient for the purpose were imported, the natural trees of the country being too small.

Place, in his discoveries, found in the interior débris at Khorsabad a large number of cylinders of terra-cotta, about ten inches high and thirteen and one-half inches diameter, and he thinks that by means of one or more (according to the size of the chamber) penetrating the roof at various places, the rooms would be sufficiently lighted and ventilated. No other use has yet been discovered to which these cylinders could be applied.

Now, as we shall see later, the Assyrians were great arch-builders; they were apparently well acquainted with both the round and pointed forms of the arch: some few bricks especially made for vaulting with a round arch, have been discovered, "concave at the bottom and broader at one end than at the other;"² but the greatest arch actually discovered had a span of only fifteen feet.

Messrs. Perrot & Chipiez, the latest authorities on the subject, although thinking M. Place's theory very justifiable, believe, themselves, that the rooms were in every case roofed with an arch of crude brick, a vault of round-arch section, such as have been discovered here and there. The immense quantity of rubbish shows that the structure of the roofs was very thick. Explorers have come across no beams that would support the theory of flat roofs, and as regards Fergusson's theory, these authors regard it as "purely fanciful." Assyrian clay is of a more plastic and tough character than any other clay known, and after all, when it has been proved that Assyrians constructed arches, it seems most reasonable to suppose that this was the manner by which they covered in their chambers. Place's cylinders would come in as usefully in a vault as in a flat roof.

But this does not entirely dispose of the question, How was light admitted? One very important source of light was the doorway, the doors being of unusual height, quite out of keeping with the requirements for ingress and egress. Doorways from fifteen feet to twenty-two feet have been discovered at Khorsabad having a width from six feet to ten feet, even to the minor chambers, such as store-rooms and kitchens. "When," says Place, "we find architects so

¹ Continued from No. 793, page 151.

² Rawlinson.

reluctant, as those of Assyria, to cut openings of any kind in their outer walls, using doorways of these extravagant dimensions, we may surely conclude, that they were meant to light and ventilate the rooms, as well as to facilitate the circulation of the inhabitants." The bronze repoussé bands of a door bearing the name of Shalman-ezer III, and which must have been nearly twenty-seven feet high, were discovered at Bulanac, and are now in the British Museum. "The heat of the climate, as well as the nature of his materials, led the Assyrian to suppress windows while he gave extraordinary dimensions to his doors."¹ It was more usual to finish a doorway with a round archivolt, although solid bronze lintels, sills and jambs have been discovered.

The arch plays a prominent part in Assyrian architecture, and the Assyrian may well lay claim to having been the greatest vault-builder of antiquity. The construction of the pointed arch with the Assyrians was excessively rude. The form was that of an arch, but the principle of the arch did not exist. They were similar, in fact, to those of the Egyptians, already described.

One reason, and that a very strong one, against Fergusson's theory of pillars supporting the roofs is that any remains of pillars in Assyria are of the rarest occurrence.

Layard discovered a set of circular bases or pedestals, and he suggested that they supported wooden posts or, may be, pillars of a covered way, by which the palace was approached. Pillars are constantly represented on the bas-reliefs, but recent discoveries have shown that, when a column was used at all, it was subordinately, a decorative rather than a structural feature. A colonnade was not understood, and it is only through careful and diligent research that the existence of columns at all has been demonstrated.

At Khorsabad, a fragment of a wooden pillar covered with metal, in the form of scales of a palm-tree, was discovered by Place. Only one fragment of a stone column has been found; that was at the same place, and by the same explorer. The capital and the portion of the shaft are cut out of one stone; the shaft is plain and the cap cushion-shaped, ornamented with lines raised on the surface and curved like festoons. A voluted cap is that which is generally represented in the bas-relief, but no example of the kind has actually been found. They were fond of representing pilasters and pillars supported on the backs of standing lions, or diminutive winged bulls, but these also existed only in bas-reliefs, not in reality.

Colossal figures we have seen were of frequent use for adornment to open courts or the entrances of palaces. They were also used as pilasters or engaged columns, adding considerably to the magnificence of the apartment in which they were placed. But there are none higher than 18 feet, and no seated colossi have been found at all.

The Assyrian sphinx was borrowed from Egypt, but "thoroughly Assyrianized."² An example has been found dating from the reign of Asshur-bani-pal with a woman's head, lion's body and immense wings extending upward and backward to the level of the top of the horned cap, and almost as far back as to the root of the tail, very similar to the wings of the winged bulls.

The bas-reliefs so often alluded to form one of the most important branches of Assyrian architecture. They are sculptured slabs, on which are represented scenes from the public and private lives of the monarchs



Evil Genii Contending, Koyunjik.

who erected the palaces where they occur. Historical events, battles, feasts, hunting-scenes are all exhibited. Temples, houses, with foliage, trees and shrubs, are depicted, so that these slabs are of the greatest interest and importance in showing much of Assyrian manners and customs. The slabs were usually four feet or five feet high, placed like a frieze round the chambers and courts. They are of various materials—alabaster, gypsum and also limestone—and, with the Assyrians, take the place that statuary did with the Greeks, and that painting did with all European nations in later times. In Assyrian bas-reliefs three distinct periods of art may be traced. There was no background used in the earliest period. Sennacherib (704 B. C.), at Koyunjik, introduced back-

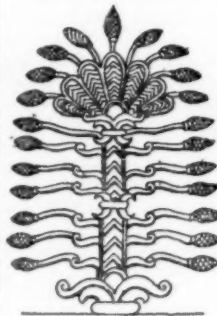
grounds representing the actual scenes where the events took place. This forms the second period, while the highest type of the art, or the third period, is reached about 667 B. C. (Sardanapalus), where figures are used to the exclusion of vegetable forms. Detached figures, though rarely found, are given up for figures in bas-relief. Carvings, when found, are of a kind that leaves no doubt that their



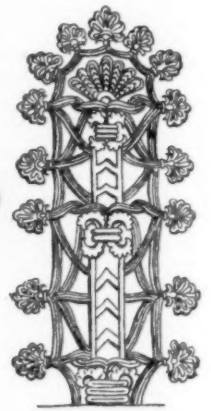
Susianian Horses, Koyunjik.

patterns are from textile fabrics, of which all sorts were produced by Assyrian looms. Some of the bas-reliefs from Sargon's Palace at Khorsabad represent the Children of Israel's captivity and the sufferings they had to undergo.

Mouldings are very rare, and female figures, according to the strict custom of the exclusion of women, which to this day obtains among Orientals, are never introduced, with the exception only of one or two instances. One of these instances is the noble woman, Semiramis, wife of Iva Lush (810 to 781 B. C.), a descendant of a long line of Baby-



Simplest Forms of the Sacred Tree, Nimroud.



Final and most elaborate Type of the Sacred Tree.

lonian kings, and who reigned in Babylon independently of her husband, and to whom we shall have to refer in the chapter on Babylonian architecture.

Perrot compares the Assyrian with Egyptian sculpture in saying that the Egyptian loved *force in repose*, while the Assyrian *force in action*. But in Assyria there was no attempt made to preserve the portrait of the deceased. All faces are exactly alike, and, in fact, funerary statues are unknown. We may notice an advance in Assyrian statuary in an evident desire and attempt to represent life. All statues and figures in bas-relief are engaged in some action, either in connection with the office held by the person portrayed, or mythological priests are represented with the symbols of their office, kings strangling lions—all are depicted with an energy indicative of careful and conscientious attention to life.



Assyrian King. From a Rock-tablet near Khorsabad.



Hawk-headed Ganuis, Khorsabad.

All early nations seem to have agreed about the adornment of their statuary with color. On figures discovered at Nimroud, paint could be clearly discerned. The Assyrians used, however, in this connection only four colors: red, blue, black and white.

Egyptians coated their statuary with stucco and painted it, while the Greeks colored parts of the actual stone or marble, such as the eyes, hair and drapery.

By the bas-reliefs, friezes of enamelled brick in color, metal plates attached to flat surfaces, bronze castings in low relief, and even colored-glass, the decoration of Assyrian palaces, must have been very complete and beautiful. The remarkable prismatic colors of

¹ Perrot & Chipiez.
² Rawlinson.

the glass are, however, due rather to the effects of time than to the process of manufacture or the skill of the artists.

Before leaving the subject of bas-reliefs, something must be said about an oft-repeated detail of Assyrian decoration which is particularly interesting. This is the "sacred tree." No inscriptions have come to light which would give any explanation of its history or meaning, but there is no doubt it was held in great reverence. It is sometimes represented alone, sometimes guarded by genii in adoring attitudes, sometimes, even, as being worshipped by royal persons. Further evidence of its sacred character may be gathered from the fact that it is found in conjunction with the Assyrian symbol of supreme deity, the winged disc, occasionally surmounted by a human bust. The tree is variously represented by the Assyrians, always conventionally, but most often as a tree of medium height, with trunk in the centre and branches starting from it on either side horizontally from the ground to the top of the trunk, and, radiating above that point, a leaf is indicated at the end of each bough, and usually a bunch of broad leaves at the foot of the trunk, as if it grew out of the ground. No attempt at perspective is made in the representation. Lenormant¹ says: "It is difficult not to connect this mysterious plant, which in every way asserts itself as a religious symbol of the first class with the famed tree of life and knowledge, which played so important a part in the story of the first sin."

Sewing had a great influence upon the art of decoration, and embroidery a far greater; it is the "prototype of all mural decoration." There are two kinds of ancient embroidery, "opus plumarium" and "opus phrypo-nium;" the first is the earliest kind and consists of colored thread laid over a groundwork in parallel lines, and this allows of great freedom of treatment; the second, is the cross stitch of canvas, the nature of the canvas necessitates the formation of squares as the stitching followed the pattern of the canvas, and we find examples of decorative work consisting of interlacing squares covering large surfaces of walls in Assyria. From this kind spring all Greek frets, diaper-work and such like mural decorations.

The author quoted above (Lenormant) has an important note on the Assyrian winged bulls. He says, "it is now absolutely certain that the word Kerub is of pure Semitic origin and has been used as a substantive to denote a 'bull' in the sense of an animal strong and powerful beyond others. In Ezekiel the words, 'face of a cherub' and 'face of a bull,' are synonymous expressions. The colossal images of winged bulls, with human faces, with lofty cidar, decorated with several pairs of horns flanking the gateways of Assyrian palaces, are associated with the Cherubim of the Bible."

A form of monument yet remaining to be described is the obelisk, differing very considerably from the obelisk of the Egyptians. Instead of being a square on plan, and finished at the summit with a truncation, the Assyrian obelisk has two wide and two narrow faces and finishes abruptly at a height no greater than thirteen feet or so, in three gradines or steps, an ornament thoroughly Assyrian but derived, not from the Egyptians, but from Phœnicia. An obelisk known as the "white" obelisk, now in the British Museum, was set up by Asshur-bani-pal, it is of white stone and commemorates by its sculptures and hieroglyphics the principal events of his reign. Its height is about thirteen feet and its base measures twenty-four by fourteen inches. Tapering slightly, it is finished by the usual gradines. Another, erected by his son and successor, Shalmanezzer II, in the central palace at Nimroud, is similar in shape but of black marble; it is handsomer and of better material, but otherwise it is similar to that of Asshur-bani-pal. An interesting particular in the inscription on this obelisk is the occurrence of the name of Jehu, King of Israel, who appears to have given tribute of silver and gold to Shalmanezzer II. Other obelisks have been discovered, but of them all, the one that has a special historical value is one discovered by Layard and illustrated in his "Nineveh and its Remains." It commemorates a no less important event than the conquest of the Medes, who dwelt in the remote country of the confines of India, by an Assyrian king called according to Vaux,² Temenbar (or Shalmanezzer II, 850 B. C.) and the story of the circumstance is illustrated by means of five rows of sculptured panels (twenty altogether) on each of its four sides beneath which is an inscription of two hundred and ten lines in the best preservation. It is only seven feet high and terminates in gradines.

Assyrian literature forms one of the most interesting discoveries of the century, and here we have preserved for us most valuable records of their history and customs. The so-called "Libraries" consisted of hundreds of tablets or flat bricks made of native clay and these are called the "books." On these, while soft, hieroglyphic representations and cuneiform inscriptions were imprinted. The tile was then baked and stored away with companion bricks or "books." Very little of their writing was committed to papyrus, but these clay libraries were very extensive. The principal one was collected by Sargon at Khorsabad (731 B. C.) and it contained an account of Babylonian astrology and astronomy in the cuneiform writings, translated into Greek by the native Babylonian historian, Berosus, about 470 years later. Another library (at Senkereh or Lussa) was devoted to mathematics and one or two tablets have been transferred to the British Museum from this collection. Nebuchadnezzar, King of Babylon, (605 to 562 B. C.) had two libraries of the same kind at Babylon, and others are known to have existed in some of the other cities.

¹ "Beginnings of History."

² "Nineveh and Persepolis."

CITY OF DAMASCUS.

In a history gathered from the monuments of the great monarchies of the ancient world it is not easy to find a suitable place for the description of a city worthy of a place, but without those monuments which would assign to it its correct position. We must, however, take some notice of this great city of Damascus that has existed from the beginning of history to the present day. From being at one period of its existence the chief city of a wealthy and prosperous nation, the first period of its history came to an end under the Assyrian King, Tiglath Pileser, about 1150 B. C. Previous to that time we have many notices of it in the Bible, the earliest of which is Gen. xiv: 15, where it appears as a well-known place even at that early time. Josephus states that it was founded by Uz, the grandson of Shem, and he quotes Nicolaus, the Damascene historian, who says that Abraham resided there, who came with an army out of Babylon. Benhadad, King of Damascus, was murdered by his general, Hazell, after his return from the siege of Samaria, when Jehoram was king of Israel, 684 B. C., and Asshur-bani-pal was King of Assyria. All this time from 1150 B. C. to 650 B. C., Damascus remained a province of Assyria until, in fact, the Assyrians were overcome by the Medes and subjugated to them, when Damascus likewise changed its rulers. Since then it has been ruled over by Egyptians, Babylonians and Persians, whichever nation was dominating the country for the time being. In 64 B. C., when the Romans under Pompey invaded the country, it became a capital city again, and for twenty years the Roman viceroys or procurators held their courts there. For this very reason, the duration of Damascus—is the very one, which has destroyed the monuments of its earlier days. What ruins still stand there, date no farther back than the Roman period, and it would be necessary to pull down more modern Damascus before we could unearth the ancient.

[To be continued.]

OLD COLONIAL WORK OF VIRGINIA AND MARYLAND.—VI.

BERKELEY.



As sunrise.

THE ancient place of Berkeley was probably settled soon after Shirley and by some of that company, of Sir Thomas Dale's, which located at Bermuda Hundred in 1611.

The gentle Thorpe, friend and teacher of the Indians who swarmed the banks of the lower James in those early times, was slaughtered here in the Massacre of 1622 by his treacherous pupils, on the ground where he had labored with such loving zeal for their enlightenment.

The present house of Berkeley was built a century later. A date cut in the bricks on the northeast corner of the house—17 E H 25—may be accepted as fair evidence of the age of the structure, which is very plain and unpretentious and lays small claim to any great interest of an architectural kind.

There is a broad veranda around the four sides of the house—a modern addition, and an innovation which must add greatly to the comfort of the place.

The old colonists were rather too orthodox in their careful imitation of the English models after which they built, and they used many features, which, though quite appropriate in the climate of the mother country, must have made their homes upon the lower James decidedly uncomfortable in the fervid summer heat of that favored region.

² Continued from No. 719, page 163.

In our own day no one would forego, in a country house, the indispensable luxury of a generous veranda for the sake of an academic exactitude in style, but in the majority of the earlier colonial houses there was nothing to shelter the walls from the noonday glare. Perhaps in point of greater adaptability to conditions and circumstances our later methods are truer, in this respect at least.

The woodwork of the interior of Berkeley is simple but good.

The frieze and cornice in the principal rooms are very nice and refined, the illustration shows a very graceful mantel in the parlor, and the treatment of the arch on either side of the chimney-breast in this room is also worth studying.

Berkeley has not been well kept up. It has passed out of the hands of the descendants of its founders, the Harrisons of Berkeley, and has in consequence suffered many changes.

"Of all the ancient families in the colony," says Griggsby, "that of Harrison, if not the oldest, is one of the oldest. The original ancestor, some time before the year 1645, had come over to the colony; but as his name does not appear in the list of early patentees recorded by Burk it is probable that he purchased land already patented or may have engaged in mercantile pursuits. The first born of the name in the colony, of whom we have any distinct record, was Benjamin Harrison, who became a member of the Council and was speaker of the House of Burgesses, and died in the Southwark Parish, in the County of Surrey, in the year 1712, in his sixty-second year." Mr. Griggsby thinks it probable that his father was the Herman Harrison who came over in what is called in Smith's History, "the second supply," or Master John Harrison, who was Governor in 1623, and adds "that from the year 1645 to this date—a period of more than two centuries—the name has been distinguished for the patriotism, the intelligence, and the moral worth of those who have borne it."

Of the Benjamin Harrison of Surrey, born in Southwark Parish in 1645, an epitaph declares: "Here lieth the body of the Honorable Benjamin Harrison, Esquire, who did justice, loved mercy, and walked humbly with his God, was always loyal to his Prince and a great benefactor to his country."

The first of the name was a zealous friend of the church and a liberal contributor, his posterity have ever continued true to it, and the two last members, with their families, have done much to its partial



From the portrait of a lady
of the reign of Queen Anne. . . "Over the water in Charley"

revival within the last thirty years. The ministers have ever found their seats to be hospitable homes when in that part of the parish. They have set good examples in the religious teaching of their servants, and in order to promote this, have built a chapel between them for the especial benefit of the same.

WESTOVER.

LOOKING across the level fields from the generous veranda of Berkeley, the eye seeks out a group of tall trees, not far off upon the river side. Through the interlacing limbs and branches, bare in the late November days, one makes out the solid bulk of a great square building with conical roof and tall chimneys towering up among the tree-tops. The dull red of the old English brick is just apparent in a subdued glow of color. On the edge of the trees there is a perfect village of out-buildings, barns, stables, cow-houses, corn-cribs, the smithy, the chicken-house, the dairy and innumerable smaller appendices. A road winds across the farm-lands toward the buildings. It is the old manor-house of Westover, standing proudly beneath its ancestral oaks.

From the broad, smooth lawn which runs to the river bank on the south side of the house, one is impressed with the simple grandeur of

the front. The brick walls are two stories in height, with a generous base, and fitly crowned with a fine sweep of roof. The only bit of exterior detail making the least pretensions to richness is about the doorway, which is flanked by broad, fluted pilasters surmounted by richly-carved Corinthian capitals, and crowned by the broken pediment so much used in the architecture of that day. The rest is but plain brick wall pierced, in absolute regularity, with windows. On the left [right in the reversed illustration] or west is a low wing containing the kitchen, and joined to the house by a covered way. Beyond is another out-building, and, farther on, the eye follows an old box hedge bordering the generous stretch of the gardens.

The too obvious modernity of a painfully whitewashed paling fence, joining the house on either side, rather hurts the eye, but in the mansion itself nothing mars the impression of aristocratic antiquity.

A broad and easy flight of stone steps, much worn and chipped and stained by time, leads up to the door, and, looking in through the open portal, one sees a great hall with stone floor and panelled walls, and a splendid stairway in rich old black mahogany, ascending by easy stages to the upper apartments. Everywhere there is breadth, simplicity, elegance, in the aspect of the interior. The state rooms open out of this great hall, which, by the way, has a door opposite the one just described. This door gives upon the rear or garden side of the house. There is a gravel walk running straight down to the gates, which are of wrought-iron tracery quite good in design. The gate-posts are surmounted by a couple of eagles made up of wood and tin in quite a fearful and wonderful way, and wearing, in truth, a very dingy and dejected air. Presumably, these birds have succeeded a pair of eagles in bronze, doubtless heraldic emblems of the family of Byrd. Upon this I am, however, without definite knowledge, never having had the luck to come across a book-plate or crest of the founder of Westover.

There seems to me always something very satisfying in the effect of one of these old colonial rooms. In the first place, they are generally, as at Westover, square in shape, and with good proportions of height of walls to floor-area. The eye rests with quiet pleasure on the low, plain dado, with low base and surbase of simple mouldings, not seldom enriched with some flutings or other carved work. Above this, the walls are covered with woodwork in large panels defined by rails and styles of good width, the whole surmounted by a good frieze and rich cornice projecting well upon the ceiling.

The ceilings are generally whitewashed, but frequently enriched with exceedingly delicate and graceful relief-work in plaster. The whitewash is not seldom the expression of some modern housewife's ill-directed efforts at neatness. At Mount Vernon, they found under the scales of lime in one of the smaller rooms a ceiling tinted in a soft tan color, upon which the rayons of plaster-of-Paris or putty in half-relief are charmingly brought out. The pictures of the drawing-room at Shirley will present all this I have been trying to describe about as well as views of any other house in Virginia. It is veritably a charming old house. The same treatment of interior is found at Westover.

There in the great panels hang the ancestors, looking blandly forth from their ancient canvasses, the sheen of their silks somewhat dulled and the bloom of their snowy necks a trifle faded, perhaps, and with a fine crackle over the surface, but showing an added depth in the tones of velvets and of the sombre backgrounds in which they have gained in suggestiveness more than has been lost of clearness of detail and brilliancy of color.

Westover possesses many wellnigh inestimable treasures of this sort. Its walls are enriched with the work of many a famous hand. There is an authentic Sir Godfrey Kneller, and even a Vandyck.

There are two Knellers, in fact, the portraits of William Byrd and his daughter Evelyn.

"Byrd of Westover" was a great gentleman, and while he was in London he cut a notable figure, as indeed he did also at the court of France. And among the noblemen whom he made his friends there was one, young Lord Peterboro' of a distinguished Roman Catholic family, who would have made sweet Evelyn his lady had not that irascible old Protestant, Colonel Byrd, who firmly opposed the match from the first, hurried the girl across the seas to Westover and there shut her up, to die, the legend hath it, of a broken heart—or of boredom, perhaps—for to a London-bred girl and one accustomed to the splendors of the Court circle of England, it may have been, at times, a trifle dull at this grand old home of her father's on the River James. Fancy that there were no roads of a passable character in those days, and that the gentry went about to one another's houses in pinnaces and rowboats, and also that in the sparsely settled country there were but a handful of people within reach of Westover, and one can readily believe that those were dreary days for the poor child so cruelly torn from the arms of her lover, and from the friendships of her youth. Her tomb is there in the garden near by among other monuments. There was a chapel there in Evelyn's time, rebuilt afterward at Evelyn-ton.

In Colonel Byrd the Third's time the incumbent of Westover church was one Dunbar, who has left behind him the record of a life of not unquestionable saintliness.

He was indeed, even in those hard-drinking, free days, notorious as a drunkard and gambler. He carried a message once from Benjamin Harrison of Berkeley to Benjamin Harrison of Brandon. What was the cause of disagreement between those distinguished

gentlemen, and what ever came of it is not clearly set forth, but the point is—and I think it is Bishop Meade who tells the story—the cartel was delivered through the kind offices of the parson.

He was himself one of the principals in a duel growing out of a disputed bet—upon a horse-race—and he is said to have wounded his adversary.

The first Colonel Byrd was the author of the Byrd Manuscript, an unpublished memoir, which has the distinction of being the only existing literary relic of early Colonial times in Virginia.

He was the founder of Richmond and of Petersburg.

His heir, the second Colonel William Byrd, of Westover, greatly increased the extent of the estate, by the acquisition of great bodies of land in Virginia and North Carolina.

This gentleman was educated in England, and afterward lived at Westover in the same princely state as did his father before him. The house was famous for hospitality and good cheer, nor has it yet forgotten to exercise, as of old, these generous qualities. The life was that of the landed gentry of Mother England. Culture and refinement in a high degree must have been the characteristics of the builders and dwellers of these fine old manors.

There is a restful simple dignity about them, unspeakably grateful to the modern observer weary at heart of the turgid over-decoration of the interiors of our great houses of to-day. There is reserve in the old work. There are broad plain surfaces where the imagination reposes comfortably. Decoration is focussed, not spread lavishly over everything. Perhaps the frieze of a mantel, very richly and delicately carved, or an elaborated entablature crowning the architrave of a doorway, gives the centre, the keynote, of the room. Nothing is forced. Odd effects are not sought. The result is restful, refined, satisfying. The aim of all good work should be to reach something of this sort, not necessarily following the model with too much servility, but certainly always holding the hand, leaving something undone, avoiding a too-startling originality.

The art which can stir the imagination and move the soul by simple means, is great art.

Following the lead of the few conservators of taste, who, surfeited with novelties of revived mediævalism, turned their tired eyes again with favor upon the homes of their fathers and with loving appreciation of the familiar old forms began slowly to reproduce here and there a bit of the old work, there is coming on a throng of imitators, a rushing mob of "Old Colonial" revivalists under whose feet will be trampled out of sight in a year or two, much of this quiet quaint beauty and grace of the old style. The wave is upon us and will inundate the land.

"Old Colonial" is the new catch-word of the trades. They make yards and yards of pretty little mouldings, which you can tack up on your old wood-work, and with a daub of ivory white added, you can accomplish cheap effects in pure Colonial. There are now "Old Colonial" wall-paper friezes to be had at the paper-hangers, and you are tempted with fenders and andirons heavily be-ribboned and quite smothered under wreaths and garlands of a gorgeous Colonialism, never attained in the actual old work, and all of the most brazen brass. It is hardly worth while to note that in the old stuff the ribbons and flowers were worked into the decoration of the mantel, of the frieze or of the ceiling, and not generally used to adorn the shovel and tongs.

And yesterday I saw in the window of a furniture concern a large panel of Moorish fret-work painted in old ivory, and further enriched with delicate pilasters and capitals in the most authentic Colonial.

The stained-glass people are turning-out some wonderfully rich things in Colonial forms, and, while there may have been no "cathedral glass" in the old houses, there really might have been, you know. A very old Colonial house with a roof of red Spanish tiles is, at least, convincing evidence of our emancipation from the slavishly academic adherence to style which marks the modern work of our brothers beyond seas.

But I am forgetting that there is yet another Colonel Byrd to be disposed of, and it will be remarked that the rank of colonel seems to have an inheritance pertaining to the first-born male child of a Byrd of Westover. It was, perhaps, entailed with the estates.

The third William Byrd was born in 1728, and in 1737 the present manor of Westover was built. He entered into enjoyment of his estates in the year 1744. He saw service during the French and Indian wars, and was at Fort Cumberland with George Washington in August, 1758, in command of a regiment of Virginia volunteers. He took unto wife Elizabeth Heil Carter, of the neighboring manor of Shirley, and subsequently, upon the demise of this estimable lady, was married to Mistress Mary Willing, of Philadelphia, by whom he had eight children, three of whom in due time married members of the Harrison family, one a Page, one a Nelson and one a Meade.

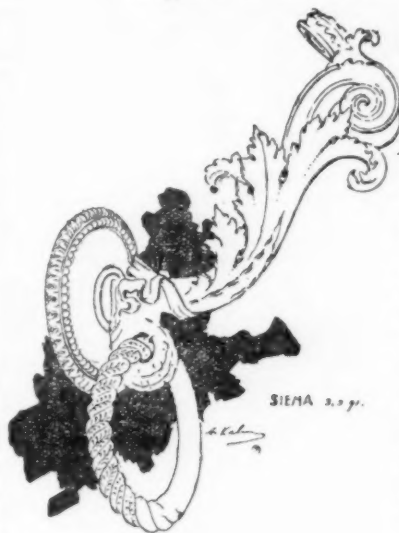
The Colonel lived much abroad, and was a man of fashion in the London of his day. Rather recklessly indulgent of his gambling proclivities, he left his estate in debt when he died in 1777.

The widow lived until the year 1814. She has been accused of plotting to assist Arnold, and letters from her were, in fact, found aboard one of his vessels which got aground in the river and fell into the hands of the patriots. At her death, Westover passed away from the family of the founder.

[To be continued.]

THE ITALIAN SPECIALTIES IN DECORATION AND THE INDUSTRIAL ARTS.—I.

INTARSIA, OR PIETRA-DURA WORK.¹



ITALY, like every other country, has its specialties; and, as Italy is a particularly artistic country, so are the Italian specialties particularly concerned with matters of art. To study the history and development of these specialties, and their present practice, will be the object of a series of studies which I hope may not be uninteresting to my American colleagues.

I will begin to-day by speaking of the intarsia, or pietra-dura work, a Florentine specialty, which has fallen into lamentable decay; partly through the fault of those who have practised it in recent times and who have degraded it by falsifying its character; partly through the change of fashion, and partly for reasons of economy, which, in old Europe, and particularly in Italy, have arrested the development of all the arts of luxury.

The idea of beginning my observations by speaking of intarsia, or inlay of hard stones, is suggested to me by two circumstances: The first is, that in Florence a project is now under consideration for re-establishing the so-called "Opificio delle Pietre Dure," or Workshops for Hard Stone, the centre of the industry which I have to study; the second is, that in North America, to judge from what I have read,² there is a taste for inlaid stone-work, which is used in costly furniture following, apparently, in this the opinion of Ruskin the eminent and transcendental English critic.

Hard stone is, at present, more frequently found used as a decorative material in Asia and Europe than in America; but I believe that it will not be long before you will use it as it was once used with us. Work in such material, both from the cost of the stones, and the great labor involved, cannot be applied on a large scale. In Italy there are some sumptuous altars and altar-fronts, like the splendid high-altar of the Certosa at Pavia, and some chapels and boudoirs, but the work is more suitable to small surfaces, with modest surroundings.

The application of the work in hard stones, such as has been used in Italy, and seems to be coming into use in America, dates, in Italy, from the sixteenth-century. At the end of that century a sort of furniture came into fashion which was adorned with small columns and arches, directly inspired by the forms of architectural construction, so that, instead of furniture, some of the pieces resembled models of the fronts of palaces, even the windows and niches, in some cases, not being wanting. The style of these objects was a very impure Classic. Of these architectural pieces of furniture, which went by the name of "cabinets," there was in Italy, at the time of which I write, a veritable flood. The centres from which they spread were Florence, Milan and Venice. In Florence, they were inlaid with pietra dura, in Milan with engraved ivory, in Venice with mother-of-pearl and glass. Sometimes names very celebrated in the history of art were connected with these cabinets. One example, of ebony, with columns of lapis lazuli, agate and other precious stones, inlaid with miniatures representing the more beautiful Florentine ladies of the day, was, according to Baldinucci, executed by Bernardo Buontalenti (1536-1608) for Francesco dei Medici. Not less renowned is another cabinet, for which the eminent sculptor John of Bologna (1524-1608) modelled a series of bas-reliefs in gold, representing some of the scenes in the life of the same Grand Duke.³ In connection with these pieces of furniture with pietra-dura ornaments, Vasari, the celebrated Plutarch of the Italian artists, mentions with honor the name of the Tuscan Bernardino Porfirio di Leccio (1601) whose works of this kind were numerous and magnificent. Among his other works is frequently mentioned a splendid table, which he executed for Francesco I, and which cost an enormous sum.

I have shown that the finest known objects of this sort were made by eminent artists for Francesco dei Medici, and it is certain that

¹ Intarsia, or combination of hard stones, must not be confounded, as it is by many, with mosaic. The manual processes are the same for both. The difference consists, substantially, in the material employed. In the pietra-dura work, the materials are very hard and precious, and the work laborious, while in mosaic the materials are mostly calcareous, easily worked, and of no great value.

² See Kuntz: "Gems and Precious Stones of North America."

³ This splendid work of art has been lost, or perhaps stolen or destroyed. The golden bas-reliefs, by John of Bologna, have, however, been saved, and are now in the Cabinet of Gems at Florence.

Florence owes to this prince the development of pietra-dura work. The Grand Duke Ferdinand I, in the interest of the new art, provided an establishment for its practice on the Casino of S. Mark; from which it was moved, in 1558, to the first story of the Uffizi building. There were collected all the best Lombard and Tuscan workmen, with a considerable force of painters, engravers of gems, designers and workers in crystal, porcelain and hard stones.

I have said that in the establishment at the Uffizi some Lombards were united with the Tuscan workmen. This assertion may be questioned, as it is generally maintained that Tuscany alone practised the art of pietra-dura work; but it is certain that at the end of the sixteenth century there were in Florence, among the best of the "intarsiatori," a certain Giovanni Bianchi, who arrived about 1580, some Gaffurri, and others, who worked in the Uffizi establishment under the direction and supervision of Bernardo Buontalenti, the distinguished painter, sculptor and architect; and in the documents relating to the establishment these men are called Milanese; and this leads Lanzi to believe¹ that the invention of the combination of hard stones ought to be attributed to Milan, where, on account of its proximity to Switzerland, whence the supplies of precious stones were drawn, the art of putting them together had arrived at a high state of perfection. I am far from agreeing with this belief of Lanzi's; and it is not necessary here to discuss the origin of the art. Returning, therefore, to my history, I will observe that the origin of the Florentine manufactory, the only one in Italy which became famous, was anterior to the arrival in Florence of the Lombard workmen. This assertion is based on facts which cannot be denied, and which relate to that Bernardino Porfirio who executed works in pietra dura many years before the arrival of Bianchi in Tuscany. Documents prove that this Bernardino di Porfirio da Leccio had executed, in 1556, an octagon of ebony, inlaid according to the designs of Vasari; and, in 1558, he made another, similar to the first, for the prince Francesco dei Medici. This does not prove, obviously, in the eyes of disinterested persons, that while such an art flourished in Florence, it may not have been cultivated also at Milan; and we have positive proof of its existence in the Lombard capital, in the work executed in 1511, for the Certosa at Pavia, by the hands of Giovanbatista Sacchi, Francesco Briosco and Silvestro da Carate. These works consist in a remarkable series of altar-fronts, of a rather fantastic and vulgar design; so that we may conclude that for perfection and taste in the art which we are studying, we must still look to Tuscany, and to Florence, where the inlaying of hard stones prospered in the highest degree under the encouragement and protection of the Medici.

Although, during the short reign of Francesco I, charming works were executed in Florence, it was particularly under Ferdinand I that the royal manufactory of pietra dura began to give occasion for hope of a glorious future. Educated at the papal court of Rome, that prince had there conceived the wish to become the Mæcenas of artists, perhaps more from ambition than from any lofty instinct of mind. However that may be, after having instituted a system of supervision of the new establishment, Ferdinand I carried into effect, the idea already conceived by Cosimo I, of founding a magnificent chapel, in which should be erected splendid mausoleums for his predecessors and successors on the throne. He himself laid the first stone of the proposed edifice, behind the choir of the basilica of San Lorenzo, on the sixth of August, 1604, and confided the execution of the work to the architect, Matteo Nigetti, basing it on a drawing made by Giovanni dei Medici, who was well-versed in architecture. He intended that the chapel should have its walls encrusted with marbles and precious stones, and that the Establishment of pietra dura should have the exclusive right of providing this work, as well as that for the family mausoleums.

This sumptuous sanctuary of the dead, as has been well observed, may be regarded as having given life to the art of pietra-dura work. Its richness is marvellous, and Ferdinand I intended to make of it a perfect treasure. Such was the enthusiasm with which that prince determined to perfect the art of stone inlaying that he brought to the direction of the establishment at the Uffizi, the greatest artists of the time, Costantino dei Servi, Bernardo Buontalenti, Matteo Nigetti, Gianbologna Andrea Mariotti, called Il Meriga, Lodovico Cardi da Uccelli, Bernardino Barbaletti, called Poccetti, etc. The fame of the Florentine establishment of pietra-dura induced also a neighboring State to cultivate this artistic industry. France, through the shrewdness of Colbert, the great minister of Louis XIV, had gained from Venice the secret of the manufacture of glass and mirrors, and now attempted to take also from Italy the brilliant art of stone inlay. If the artist, Ferdinand Migliarini, who went to France with the purpose of initiating the French in the working of hard stones, had succeeded in his intention, France would have seen its desire gratified.

Better results were obtained in intarsia and pietra-dura work in Naples. During the reign of Cosmo III, Giovanbatista Zucconi and Raffaello Muffati were called to Naples to teach these arts, and a laboratory was founded there, the direction of which was confided by the King, Charles III, in 1738, to the excellent inlayer, Francesco Ghinghi. This laboratory was opened near the church of San Carlo alle Mortelle, in Naples, where it remained until the last years of the Bourbon domination. Arranged like that of Florence, the Neapolitan laboratory worked exclusively for the royal house. The altar of the

chapel in the Caserta, with its surroundings, in Oriental granite, were the first efforts. The tabernacle, on which work was still continued in 1845, is perhaps one of the richest works ever executed by the Neapolitan establishment. It is entirely formed of amethysts, lapis lazuli, petrified wood, granite, agates and jaspers, of marvellous beauty.

The Florentine art of stone inlay, besides Naples, reached also the East Indies, through some Florentine artists, who, having travelled to the dominions of the Mogul in search of silicious stones, initiated into their art some of the color-loving people of the country. It was in this way that the tomb of Rai Mehal, at Agra, came to have its interior enriched with pietra-dura work in the Florentine manner; and at Delhi the walls and columns of the two audience-halls in the palace of the Mogul emperors, with the bath-rooms, are ornamented in the same manner; while, in the same palace, according to Doctor Bernier,² there is a dome, the interior of which is encrusted with precious marbles, in a manner very similar to that of the Medicean Chapel at Florence.

The mention of the Medicean Chapel naturally makes me turn again to the Florentine establishment, which, after so much merited glory, began to see itself little by little deserted by popular favor. After the magnificent works of the Medicean Chapel had been suspended, on the death of the Electress Palatine, in February, 1742, the Florentine pietra-dura laboratory was reduced to the production of works of little interest. In this unhappy condition it remained until the accession of Ferdinand III, of Lorena, who called the architect Niccolò Gaspero Paoletti, and commissioned him to study the most available method of completing the Chapel of the Medici. The political convulsions of 1793, however, interrupted these studies, and it was not until 1818 that the incrustations of the walls of the Chapel were recommenced.

But for the Florentine establishment was reserved a sad fate. After the political overturn of 1859, it became State property, and dragged along a sterile and useless existence, which is still continued. From time to time various Florentine journals have called attention to the lamentable condition of the establishment, but without result. Several plans have been proposed for its benefit, but, to the present day, the generous schemes have resulted in no generous deeds. Quite recently, the Council of the Florentine Commission of Fine Arts, after serious consideration of the enervated state of the "Workshops of the Hard Stones," approved a resolution in which it expressed the wish that the establishment, instead of continuing to occupy itself with commissions, which was once its glory, would concern itself with more practical labors, such as the restoration of monuments.

So ends everything in this old world!

Having finished the history, let me speak of the practice of the art, as it has been carried on in Florence. The silicious stones which compose the decorations are divided into small pieces by means of a wire stretched by a wooden bow, and fed with powdered emery. This answers the purpose of a saw, which is managed by hand, and cuts the stone into small pieces, which are sorted, and form the painter's palette. The intended decoration is drawn in outline on paper, like a cartoon for tapestry, and, when finished, the drawing is cut into sections, corresponding in number to that of the artists who are to carry it out in stone. The chief of the establishment directs the general execution of the design. The joints of the several portions are fitted with extreme care, by means of a file, formed by dipping a metallic rod into emery. The bits of stone are held temporarily together by a mastic of plaster and wax, and are finally bedded in plaster for permanent security.

The next step is the smoothing and polishing. The first is done by rubbing with a "planer," supplied with emery, and, when this process is complete, the final polish is given with very fine emery, applied first with a smooth piece of stone, and afterwards with a board, covered with cloth.

The manual part of the art of intarsia in pietra-dura is, therefore, very simple. Nevertheless, until the first decade of the present century it was kept a profound secret, and was then only revealed by some workmen, who had deserted the Florentine establishment, and betrayed its mysteries. One of these, Gaetano Bianchini, after leaving the royal establishment, devoted himself to the endeavor to find a means of cheapening the process. He succeeded in this, by the simple process of substituting for many of the hardest and most costly stones calcareous materials, shells, and other soft, but agreeably colored substances, which were easily worked. To this variety of the art, Bianchini devoted much intelligence and enthusiasm, and before his death, in 1866, he had obtained noteworthy results.

ALFREDO MELANI.

(To be continued.)

PAINTING THE FORTH BRIDGE.—As some curiosity has been expressed as to the quantity of paints and oils used in the construction of the Forth Bridge, Messrs Craig & Rose, of Glasgow, who held the contract, have made up a statement of the amounts actually supplied, and these were found to be as follows: Machinery and illuminating oils, 980,072 gallons; paint oils, 35,527 gallons; paint, 250 tons. It is computed that the quantity of oil used would have been sufficient to float one of Her Majesty's first-class cruisers, and sufficient to cover 1,100 acres, or nearly two square miles of surface.—*Specialties.*

¹ "Storia Pittorica dell' Italia," Vol. I, p. 295.

² "Memoirs on the Empire of the Grand Mogul." Paris, 1661.

HYDRAULIC MINING.



CLUMPY MUSEUM POLISHED STEEL COPPER

filled up, others created—that in shape has been altered. The old

remove mountains to such as had faith only to the amount of a grain of mustard seed has never been exemplified, but the hydraulic miners have afforded the most ample demonstration of their ability to move mountains in the search for wealth. Lofty mountains have in fact been brought low through no other agency than the pipe line, the monitor, and the sluice, and the tremendous power of water never received such an exemplification as in the history of the hydraulic mines of California.

There are, indeed, so many remarkable facts connected therewith that, were they not abundantly substantiated, one might well be pardoned for receiving their relation with incredulity. One might not believe that a stream of water issuing from a nozzle or pipe, six inches in diameter, and with no other force but gravity behind it, would have much effect at any considerable distance from the aperture, yet such an apparently insignificant stream, with a fall behind it of 375 feet, will carry away a solid boulder weighing a ton or more at a distance of 50 to 100 feet, while at a less distance it will toss such a boulder about as a boy would throw a pebble.

The velocity and force of such a stream as it issues from the nozzle of the monitor is something terrific. The column of water is solid—so solid that if one were to undertake to thrust any object into it, it would make no more impression than if it were iron instead of liquid. If a crowbar or other heavy object be thrust against the stream it would be snatched from the hand and thrown to a great distance as if it were a feather weight, while the man who should firmly grasp an axe and attempt to cut through the stream would undergo an experience that he would remember for many a day.

If a man were to receive the full force of such a stream at a

distance of a couple of hundred feet, even though the impact be momentary, he would be killed as quickly as though struck by a cannon-ball. He might escape being mangled, but the breath would be most effectually and suddenly expelled from his body.

At 400 feet from the nozzle, a six-inch stream with 375 feet fall, swung momentarily against the trunk of a tree will denude it in a second of the heaviest bark, as cleanly as if an axe had been used. Whenever such a stream is turned against a gravel bank it cuts and burrows into it in every direction, gouging out great caves, causing thousands of tons of earth to fall, which is in turn quickly disintegrated and washed into the sluices. Boulders so heavy that a man can scarcely lift them are tossed about like chaff, stumps and trunks of trees are thrown to one side like straws, and the work of destruction goes on at a pace that is appalling. If one who has never seen a monitor in operation under full head, could imagine the ordinary stream from a fire hose magnified about a thousand times, he would

be able to form some conception of its power.

The water is brought in open ditches or flumes, sometimes from a great distance, around mountain sides and across valleys and ravines. When the vicinity of the mine is reached, a box is put in, from which a pipe conducts the water to the point where it is to be used. It is the distance between this box and the level of the monitor that gives the pressure. With from 300 to 450 feet fall the execution done is tremendous. At the monitor the water is conducted into a still smaller pipe, the compression giving it still greater force. The monitor is constructed something like the ordinary hose-nozzle, but has a ball joint that permits it to be swung in any direction. It is balanced with weights, and by means of an ingenious device, known as a deflector, the tremendous stream can be turned in any direction by the slightest force: almost the weight of a finger will suffice to direct the movement.

Easily as it is managed, how-

ever, the monitor occasionally becomes uncontrollable, and when this happens a scene of destruction and even death ensues. The pipe sways to and fro at its own volition, and the stream flies first in one direction and then in another. If the miners are not warned in time to get out of range, they may be mowed down as if by the discharge of a volley of grape. Sometimes the runaway monitor seems as if manipulated by some bloodthirsty monster, and appears to be deliberately turned upon the fleeing men, following them as they fly in every direction and overtaking them before they can reach a place of safety. In one case a sluice-tender, hearing an unusual noise, raised himself above the edge of the cut in which the sluices ran just in time to receive the full stream square in his face and chest. He was knocked down, thrown into the sluice and



Monument to William and Frederick at Gieichenstein. From Ueber Land und Meer.

washed away. When found his body had not a stitch of clothes upon it, and apparently every bone in it was broken.

When a monitor gets away from control in this manner, there are two things that can be done. The water may be shut off at the head-gate, a process involving much delay and perhaps loss, or some brave man may rush in and get to the monitor without being struck by the stream. To do this requires agility and pluck. The stream is liable to box the compass inside of a minute, and its course must be watched and the probable direction noted. Then over the rough surface the man must hasten, careful not to make a misstep, and at the same time ready to flee should the erratic stream betray a tendency to change its course so as to endanger life. There have been many hairbreadth escapes and some thrilling exhibitions of bravery under such circumstances as this, and it has been only by the exercise of the greatest coolness and bravery that great loss of property and life has been prevented.

A. J. Bowie, of San Francisco, in his work on hydraulic mining, states that the stream from a six-inch nozzle, with 450 feet vertical pressure, delivers a blow equal to 588,735 foot-pounds per second, equivalent to 1,070 horse-power. When one comprehends this fact, he will be abundantly prepared to believe almost anything that could be said about the power exerted by such a stream.

With a force such as that exerted by the stream from a monitor, it is apparent that a tremendous amount of material can be washed away in a very short time. The quantity removed depends, of course, upon its nature, whether loose soil, ordinary gravel, or cement gravel. In some places, under favorable circumstances, as high as thirty-six cubic yards to each inch of water have been removed in twenty-four hours. With a flow of 500 inches the bulk removed each day is thus seen to be enormous. In cement gravel, the amount handled daily is as little as three cubic yards per inch. The quantity handled daily is, however, almost entirely dependent upon the grade of the sluices. In the case of the highest amount just mentioned, the stream had a fall or head of 350 feet, the banks were 100 feet high and the sluices had a grade of one inch to the foot, while, 1,000 inches of water were used. Under such conditions and with such results, it must be apparent that the removal of mountains is only a question of time—and not a very long time, either.

Some idea of the immense amount of earth and gravel moved by the hydraulic mines of this State can be gathered from some recently published statistics upon this point. During the height of the hydraulic industry there were in use from the Feather, Yuba, Bear, and American Rivers, Butte Creek and the two Dry Creeks, a total of 10,650,505 miner's inches of water each twenty-four hours. At an average of three and one-half cubic yards of gravel to the inch, there was thus washed away daily 38,600,000 yards of material. This is a low estimate. As an actual fact much more was carried away. But the amount stated represents a mass of earth 500 yards long, 356 yards wide and 200 yards high. With such a tremendous quantity washed away every twenty-four hours, it can readily be understood that no great length of time need elapse literally to move mountains and cast them into the sea.

THE MONEY VALUE AND REAL USEFULNESS OF ALUMINIUM.

A CORRESPONDENT writes from Springfield, Mass., to the New York *Tribune* in the following unflattering vein as to the real usefulness of the new metal:

"It is interesting to watch certain crazes which at certain times in history have taken hold of and still affect the minds of men. Thus, the tulip craze, the South Sea craze, the balloon craze in the beginning of this century and end of the last. In the present age we may notice the aluminium craze. How people will invest thousands of dollars on hearsay evidence, when they could ascertain the truth by buying twenty-five cents worth of pure aluminium wire or sheet, belongs to the oddities of capital gone crazy. The yarns about aluminium are so numerous and are repeated in so many bold and frank lies that it seems almost a vain task to try to set people right.

"Now, Jules Verne, the champion writer of scientific fancy, never uses aluminium much in his fiction. He knows too well that it is no good. In '*De la Terre à la Lune*' he uses a large aluminium bullet, not because of its strength but because it is so light.

"Not long ago, a card from persons interested in the making of aluminium came to me stating that aluminium is as hard as steel. All wrong! The purer, the softer. Pure aluminium is just a trifle harder than ordinary cheap zinc or spelter, which can be soldered, threaded and drilled without difficulty, while pure aluminium cannot be soldered reliably, and for working is one of the 'nastiest' metals in existence. One great point in its favor, but only a point of skin-deep beauty, is that the aluminium rust forming in the air is white, while it is brownish red on iron, green on copper and gray on zinc—but aluminium tarnishes readily, especially in salt air. Salt water acts upon it far more than it does upon iron, and a ship built of aluminium would be full of holes after one trip around the globe. Therefore, for ship building and all parts exposed to the water it is even intrinsically inferior to iron—therefore, not worth six cents a pound.

"For roofing it is vastly inferior to galvanized-iron, because it cannot be soldered, and much inferior to zinc—therefore, not worth five

cents a pound. For vessels to be used in the kitchen, it could only be employed if salt was kept away, but with salt present, it would not have the slightest advantage over ordinary tin pails—therefore, would not be worth eight cents a pound. For parts of machinery where strength is required, weight for weight, it is not as strong as iron. As such iron can be bought for four cents a pound, aluminium would be worth less than that; for the same strength, aluminium would be four times more bulky. For spoons and knife-handles, where no particular quality except looks is called for, it might be worth as much as tin, say twenty-two cents a pound. The drawback in that use would be its great softness, as it soils the fingers when handled, like lead. The only use for which, at present, pure aluminium may take, with advantage, the place of longer known metals, is for electric appliances and wires. For the same diameter, aluminium is twice as good a conductor as iron; its weight is almost exactly one-third, but its strength is only one-fourth, so that the wire could only be stretched three-fourths the distance over which, now, iron wire is stretched to keep the same relation between weight, strength and sagging.

"For these purposes aluminium might be worth twelve cents a pound. It could be made harder by alloying it, especially with silicon, but even the hardest aluminium, short of aluminium bronze (which is essentially ninety per cent copper) I met with was only about the strength of brass. The alloys of aluminium have all been made and tried thousands of times, but no value has been found in them which would make the aluminium worth more than copper—say, perhaps eighteen cents a pound. The aluminium bronze keeps fairly bright, but when made in its proper proportion is extremely hard to work. In this bronze, aluminium shows at its best, but does not come up to good steel in ease of handling and working. One advantage is that the bronze is elastic and springy, even when almost red-hot. It consists essentially of ninety per cent copper and ten per cent aluminium. How much the metal is worth for advertising medals, for plaques and other uses of a more sensational character, is, of course, impossible to estimate. Its value ranks with that of the chromo. At present, its greatest use lies in the magnetic power which it has for green-backs, and in proving the defective experience of capitalists.

"While, therefore, as will be seen from the frequent examples quoted, the true value of aluminium does not lie much above that of zinc, which costs six cents a pound, the cheapest aluminium in the market is held at \$2.25, and the manufacturers are already compelled to send around circulars, in which you may read between the lines: 'Tell us some use of aluminium.' There is not a single application, at present, in which aluminium ranks intrinsically above the value of the same weight of copper, which is sixteen cents a pound. Even chemically, it has not the energy of sodium, potassium, magnesium, and in an extensive practice as a chemist I haven't had a single use for aluminium in fifteen years."

C. M.

THE MONUMENT TO THE TWO EMPERORS AT GIEBICHENSTEIN.

THE monument to the Emperors William and Frederic was unveiled on October 18, 1890, at Giebichenstein, near Halle. The sculptor, the late J. Kaffsack, has embodied in his conception more real art than is found in any of the many monuments to the late Emperors which are springing up all over Germany. The simplicity and beauty of the composition, which is let into the living rock in the face of the cliff above the river Saale, are enhanced by a singular felicity in the choice of location—in a green landscape surrounded by lofty cliffs, with the river below.

The mighty bronze shield, surrounded by laurel and bearing the profiles of the two Emperors, suggests a votive offering placed in thankful veneration at some shrine. A powerful Valkyrie-like figure indicates what the two great leaders in war have been and will ever be to their people. With the left hand she supports the shield and holds above the heroes the palm-branch, while the drawn sword in her right marks her the victress of the dragon of enmity and disloyalty, which, threatening destruction, has come forth from his cavern. Strong and sure in the consciousness of her power, the protectress stands, looking out clear-eyed and calm over the Fatherland, earnestly determined to preserve the peace which has been won and ever ready to raise the lowered sword and seize the shield leaning against the rock at the call of duty.

The monument is built of Kelheim marble, a stone which harmonizes well with the bronze, and rises in majestic proportions from the cliff and the cavern which has been cut into it. The figure of the Valkyrie is three and one-half metres in height, while that of the entire composition is six and one-half metres. The diameter of the portrait-shield is more than two metres.—*Ueber Land und Meer*.

A HITTITE BAS-RELIEF.—The Louvre Museum in Paris has been enriched by an interesting bas-relief attributed to the Hittites. Only a very limited number of Hittite sculptures have hitherto been discovered; all of them are curiously realistic and, though sometimes very clumsy, they are always natural and naïf. The new bas-relief represents a stag hunt.—*New York Evening Post*.



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

STORE OF MESSRS. A. T. DEMAREST & CO., FIFTH AVENUE, NEW YORK, N. Y. MESSRS. RENWICK, ASPINWALL & RUSSELL, ARCHITECTS, NEW YORK, N. Y.

[Heliochrome, issued with the International and Imperial Editions only.]

"WESTOVER," VA.

SEE article elsewhere in this issue. This subject and the two others illustrating the article on "Old Colonial Architecture" are reversed in printing.

MANTEL IN THE PARLOR, "BERKELEY," VA.

SEE article elsewhere in this issue.

FRONT DOORWAY, "WESTOVER," VA.

SEE article elsewhere in this issue.

DESIGN FOR THE SECURITY BANK, MINNEAPOLIS, MINN. MR. L. S. BUFFINGTON, ARCHITECT, MINNEAPOLIS, MINN.

HOUSE FOR FRANK G. RANNEY, ESQ., ROCHESTER, N. Y. MESSRS. BLOCK & BARNES, ARCHITECTS, ROCHESTER, N. Y.

NOTRE DAME DE CROATZ-BATZ, ROSCOFF, FINISTERRE, FRANCE.

[Additional Illustrations in the International Edition.]

CEILING DECORATION IN THE HOFBURG THEATER, VIENNA, AUSTRIA. BARON HASSENAUER, ARCHITECT. HERR CHARLEMONT, PAINTER.

[Gelatine Print.]

SIDE OF THE NEW NATURAL HISTORY MUSEUM, PRAGUE, BOHEMIA.

[Gelatine Print.]

TWO DECORATIVE LETTERS, EARLY SEVENTEENTH CENTURY.

WEST-END OF HOLY TRINITY CHURCH, SLOANE SQUARE, LONDON, ENG. THE LATE J. D. SEDDING, ARCHITECT.

INTERIOR OF HOLY TRINITY CHURCH, LOOKING EAST.

THE CHANCEL GATES IN HOLY TRINITY CHURCH.

THE PULPIT, HOLY TRINITY CHURCH.

DURHAM CATHEDRAL.



TWELVE NOTABLE BRIDGES.—There are still remaining bridges of great antiquity built by the Romans, says a writer in *Calvert's Almanac*, but we have no authentic record of the earliest history of so useful a contrivance.

Some remarkable specimens of bridges, constructed under the most difficult circumstances, are to be found in different parts of the world, and which are considered great feats of engineering skill. We take the following 12 as being amongst the most notable:—

1. The enormous dimensions of the Forth Bridge place it far in front of any bridge in the world. In mere size it is the biggest of the giants, and it is the greatest triumph of engineering science in the world.

2. Brooklyn Bridge was commenced, under the direction of J. A. Roebling, in 1870, and completed in 13 years. It is 3,475 feet long, and 135 feet high. The cost of building was little less than \$15,000,000.

3. The Lagong Bridge, built over an arm of the China Sea, is 5 miles long, with 300 arches of stone, 70 feet high and 70 feet broad and each pillar supporting a marble lion 21 feet in length. Its cost is unknown, but much exceeds that of the Forth Bridge.

4. The new London Bridge is constructed of granite, from the designs of L. Rennie, and considered amongst the finest specimens of bridge architecture. It was commenced in 1824, and completed in 7 years, at a cost of about \$7,500,000.

5. The Bridge of Sighs, at Venice, over which the condemned prisoners were transported from the Judgment Hall to the place of their execution, was built in the Armada year, 1588.

6. The Bridge of the Holy Trinity, at Florence, consists of three beautiful elliptical arches of white marble, and stands unrivalled as a work of art. It is 322 feet long, and was completed in 1569.

7. The Niagara Suspension Bridge was built in 1852-1855. It is 245 feet above high water, 821 feet long, and the strength is estimated at 12,000 tons.

8. The Rialto, at Venice, said to have been built from the designs of Michael Angelo, consists of a single marble arch, 98 feet, 6 inches long, and was completed in 1589.

9. The Britannia Bridge crosses the Menai Straits, Wales, at an elevation of 103 feet above high water. It is entirely of wrought-iron, 1,511 feet long, and was finished in 1850. Cost \$3,000,000.

10. The oldest bridge in England is a triangular bridge at Croyland, in Lincolnshire, which is said to have been erected about A. D. 868. It is formed of three semi-arches, whose bases stand in the circumference of a circle, equidistant from each other, and uniting at the top.

11. Clifton Suspension Bridge, near Bristol, has a span of 703 feet, and a height of 245 feet above the water. The carriageway is 20 feet wide and footway 5 1-2 feet wide. Cost, \$500,000.

12. Coalbrookdale Bridge, over the Severn, has the reputation of being the first cast-iron bridge built in England. It was erected in 1779. It consists of one arch 100 feet wide. Total weight 378 1-2 tons.

The Tower Bridge over the Thames — not yet completed — will be a notable bridge. Its centre arch is on what is known as the "bascul" principle, to be opened by raising two leaves, so as to allow ships to pass, and having, when opened, a footbridge above, available for foot passengers, 135 feet above high water. The following will, if carried out, take rank among the notable bridges of the world, namely:

A bridge across the Danube, 20 miles in length, to be constructed by the Roumanian Government, between Dudesi and Tehernavoda.

A bridge across the Hudson River, between New York and the north New Jersey shore, with a span of 2,860 feet, and, therefore, far exceeding the very wide span of the Forth Bridge.

A bridge across the Straits of Messina, 2 1-2 miles in length, connecting Sicily and Italy.

A bridge across the Bosphorus, with a span of 2,550 feet, to unite European and Asiatic Turkey.

A bridge across the English Channel, about 24 or 25 miles in length.

All but the last, says the *Mechanical News*, from which we take this list, are likely to be carried out within the next ten years. We very much doubt, however, whether the Channel Bridge will ever be constructed.

THE KARLSBRÜCKE AT PRAGUE.—A short time ago the morning papers stated that the famous Karlsbrücke, or Charles Bridge, across the Moldau at Prague was doomed to destruction by the great floods which have been creating such havoc in Central Europe. The paragraph was a brief one and probably attracted little attention, but no one who knew the pride with which, for hundreds of years, the Bohemians have regarded this bridge could read the few lines without a thrill of sympathy. To write a history of the Karlsbrücke would be to write the history of Prague during the past five centuries. This indeed were well worth the doing, for though the old world is rich in historic cities, few are more interesting than this wonderful old town with its stately buildings, its quaint old houses and beautiful gardens, and its memories of illustrious men and women — of Huss and Wallenstein, of Maria Theresa and her implacable enemy, Frederick the Great. How many times these and others scarcely less famous have passed to and fro over the Karlsbrücke. Prague was the favorite city of that splendid monarch, Charles IV, the "stepfather of the empire, but the father of Bohemia." He established her celebrated university and beautified the town in many ways, besides laying the foundation of the Karlsbrücke in 1357. For 150 years the work went on, and when finally completed in 1507, it was justly regarded as a triumph of the engineering skill of the age. Even to-day few bridges are worthy of more admiration than the old Karlsbrücke with its grand old Gothic tower and its sixteen noble arches spanning the beautiful Moldau. As time went on statues and groups of figures were placed on the buttresses of the bridge. But the days of the Karlsbrücke are numbered. During September three of its arches were carried away by the swollen river, and the collapse of a fourth a little more than a week ago renders its destruction inevitable. Begun as the night of the Middle Ages was beginning to roll away, and finished in the dawning light of the Reformation, the old bridge falls just as the twentieth century opens before the world. — *New York Times*, May 8.

FULGURITES.—"Did you ever see the diameter of a lightning-flash measured?" asked a geologist. "Well, here is the case which once enclosed a flash of lightning, fitting it exactly, so that you can see just how big it was. This is called a 'fulgurite,' or 'lightning-hole,' and the material it is made of is glass. I will tell you how it was manufactured, though it took only a fraction of a second to turn it out. When a bolt of lightning strikes a bed of sand it plunges downward into the sand for a distance less or greater, transforming simultaneously into glass the silica in the material through which it passes. Thus, by its great heat, it forms at once a glass tube of precisely its own size. Now and then such a tube, known as a 'fulgurite,' is found and dug up. Fulgurites have been followed into the sand by excavation for nearly 30 feet. They vary in interior diameter from the size of a quill to 3 inches or more, according to the 'bore' of the flash. But fulgurites are not alone produced in sand; they are found also in solid rock, though very naturally of slight depth, and frequently existing merely as a thin glassy coating on the surface. Such fulgurites occur in astonishing abundance on the summit of Little Ararat in Armenia. The rock is soft and so porous that blocks a foot long can be obtained, perforated in all directions by little tubes filled with bottle-green glass formed from the fused rock. There is a small specimen in the National Museum which has the appearance of having been bored by the terebo, the holes made by the worm subsequently filled with glass. Some wonderful fulgurites were found by Humboldt, on the high Nevada de Toluca,

in Mexico. Masses of the rock were covered with a thin layer of green glass. Its peculiar shimmer in the sun led Humboldt to ascend the precipitous peak at the risk of his life." — *Washington Star*.

A CORSICAN GROTTA SIXTY MILES LONG.—A grotto has been discovered in Ajaccio, Corsica, which is said to exceed any ever known for magnificence and size. The site is a little over a mile from the Ponte-Seccia railway station. The grotto is entered with difficulty owing to the smallness of the aperture; but upon his entrance the explorer finds himself in a vast and lofty hall, the sides of which are some twenty-five yards in height. From this there are several passages leading to an indefinite number of other chambers. A thorough investigation of the grotto has not yet been made. Tourists have attempted to explore its depths, but after six or eight hours' search have returned to the open air with their task uncompleted, but full of marvellous descriptions of the fairy-like beauty of the grotto. On one occasion a workman undertook to penetrate throughout the whole extent of the grotto. He was supplied with provisions and torches of resinous wood. He was five days inside, and during that time he estimates he walked a distance of forty miles; and he was compelled to retrace his steps only by encountering a sheet of water which precluded his further advance. He never succeeded in reaching the farthest extremity of the grotto, and he supposed that there was another outlet upon the sea, not far from Cape Revelleta and Calvi. In the latter place there is a well-known cave of great depth and yet unexplored. It is on a level almost with the sea, and is known as the Grotte du Mugissement. In times of tempestuous weather the rush of the waves is tremendous, and the thunderous sounds produced by them, augmented by the echoes of the mysterious cavern, are audible at a great distance. At such times sounds are heard at the Ponte-Seccia, and there are apertures suggesting the play of the sea upon the rocks. These sounds are well known to the shepherds on the slopes, and are looked upon as the sure precursor of a storm. What adds to the belief that the Ponte-Seccia cave and that at Calvi are one, and that the whole comprises a vast subterranean passage sixty miles in length, is the story told by a goatherd that having totally lost sight of his flock for several days, he was astonished one morning to hear that they had been seen at a spot near Calvi. Two Professors attached to the Faculty of Sciences of Christiania have inspected the cavern of Ponte-Seccia, and their explanation of the existence of the cave is as follows: Corsica owes its existence to an Alpine upheaval, followed later by an upheaval of the Apennines. The river Golo first flowed into the Gulf of Calvi, but the second upheaval turned its course in another direction. The cave, then, is what was once the bed of the Golo, and owes its subterranean formation to succeeding geological revolutions. This theory is borne out by the floor of the cavern, which presents the appearance of having once been the bed of a stream. At places its width is as much as twenty feet; elsewhere it is barely sufficient to give passage to a man. An expedition will be organized at Ajaccio this summer for the purpose of solving the mystery of the cavern. — *Exchange*.

A CHIMNEY-STACK 460 FEET HIGH.—The *Zeitschrift* of the Society of German Engineers contains a description of a high chimney recently erected at the Halsbrückner Hütte, near Freiberg, Saxony. It serves at present for carrying off the obnoxious gases of the calcining furnaces and the blast furnaces, but a connection is to be made also with the reverberatory furnaces of the works. As the Halsbrücken works are situated in the deep valley of the Mulde, the top of the old chimney-stack does not reach to the summits of the surrounding heights. Consequently, at times the smoke from the furnaces lay like a blanket over the neighboring fields. To remedy this state of things the present chimney-stack was designed and erected, its top reaching 138 feet above the highest summit near. At its base the chimney has a diameter of 33 feet, at its top 16 feet, its inner diameter being 8 feet. It is built throughout of massive claystone with a facing of markstone at its base. For ascending the stack during building and afterwards, climbing irons of rod-iron 1 inch thick have been inserted outside and inside. They enter the masonry to a depth of 9 3/4 inches, and are, besides, provided with grapple hooks. To carry the gases from the old chimney to the new it was necessary to construct a flue to the new one, partly of wood covered inside with lead, partly of brickwork. This proved rather expensive, and brought the total cost of the chimney up to 6,500*M*. The Freiberg chimney is the highest in the world, the next highest being that at Messrs. Townsend's works, Port Dundas, Glasgow, which is 454 feet high. — *The Builder*.

SIR RICHARD BURTON'S TOMB.—The monument, which is sculptured in dark gray Forest of Dean stone and white Carrara marble, is very far advanced towards completion. It takes the form of the representation of an Arab tent, surrounded by a large gilt star of nine points. The flap-door of the tent supports an open book of white marble, on which is inscribed Sir Richard's name and the memorable dates of his career. Below it is the tablet bearing Justin Huntly McCarthy's beautiful epitaph. Underneath on a ribbon is inscribed "This monument is erected to his memory by his loving countrymen." The interior is paved with black and white marble, covering a base of concrete Portland cement. The coffin, which is of steel and gilt, will repose above ground on two marble trestles, at the foot of which is a marble altar; while a window of colored glass will throw light on the altar and tomb. The effect will be heightened by Oriental lamps and flowers. — *Pall Mall Gazette*.

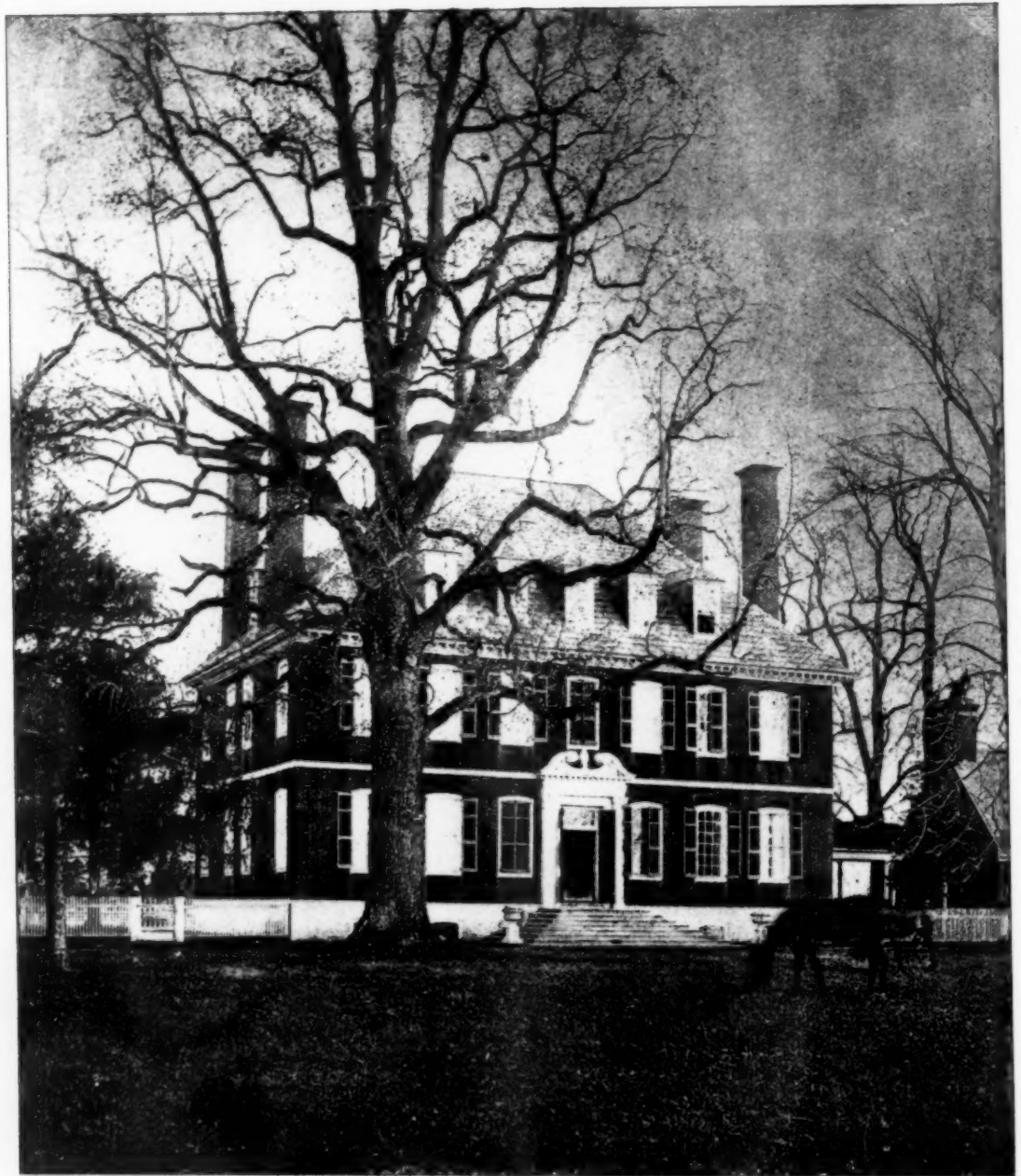
THE GOVERNMENT TO BORE THE DEEPEST HOLE IN THE WORLD.—One of the most important scientific explorations into the depths of the earth ever undertaken will be carried out near Wheeling, Pa., under the joint auspices of the United States Government and the City of Wheeling. Some months ago the Wheeling Development Company began drilling a well near this city in search of oil or gas. It was determined to bore as far as possible. The hole has already reached the depth of 4,100 feet, within 500 feet of the deepest well in the world.

In this distance a dozen of thick veins of coal have been passed, oil and gas both struck, but not in paying quantities, and gold quartz, iron, and many other minerals found. The hole is eight inches in diameter and the largest in diameter of any deep well in the world. Prof. White, State Geologist, has succeeded in getting the Government Geological Survey officers interested in the exploration, and the result is that the hole will be drilled to a depth of one mile. Then the Government will take up the work under the direction of two expert officers of the Geological Survey and drill into the earth as far as human skill can penetrate. The idea is to take the temperature and magnetic conditions as far as possible, and by means of an instrument constructed for the purpose, a complete record of the progress and all discoveries made will be kept and will be placed in the Geological Survey's exhibit at the World's Fair. — *Philadelphia Press*.

WHY ONE SHEET OF PLATE-GLASS WAS IMPORTED.—A great sheet of plate-glass that fell and went to flinders in Brooklyn the other day had a queer history. It was about twelve feet square and was worth \$1,200. It could have been made in this country, but it could not have been carried to Brooklyn, because of the tunnels it would have to pass through. It was too big to travel on the canals. So it was made in the South of France. It met with trouble in its trip across Brooklyn Bridge, and had to be canted to one side to pass under the passenger platform. After all that, just as it reached its destination it was smashed. — *Philadelphia Telegraph*.

TRADE SURVEYS

It is not always an easy matter to sift all the reports, statements and figures presented from week to week from all sections of the country regarding business, and arrive at a common-sense conclusion. Much valuable information is systematically withheld; general and more favorable figures and facts are stated. If all sides and all points be watched, however, it will not be difficult to come within gunshot of the truth. Speaking generally, trade conditions are improving. The enormous outflow of gold, as it is sometimes spoken of, and which figures up some fifty million dollars this year, is not by any means the disastrous thing which most financial writers think it to be. It will prove to be an advantage, but this advantage will have to be demonstrated before the correctness of the statement will be admitted. One effect of the outflow will be to decrease dependence upon gold throughout the world—an apparently paradoxical statement—and to stimulate the demand for silver, especially in silver-using countries. Another effect will be to increase the purchasing power of money. The advantage to the United States will be that it will purchase its imports at less cost, or rather, obtain a greater supply of imports for the same amount of money, as measured by gold. This equalization of gold will of necessity continue, but it is probable that heavy crop exportations during the coming summer and fall will turn the gold tide our way once more. The European preparations for a general war will effect gold movements for a year or two to come, or until that crisis is precipitated. The money markets are said to be easy; so far as the great interior is concerned, the supply of money is far less than apparent demands. The fact that there are nine million mortgages on farms and town properties in the United States, and that the rate of interest is from ten to twenty-four per cent throughout the far West, is a fact that needs but little comment. While such conditions exist it will be useless for Eastern money-lenders to assure Western borrowers that the supply of money is sufficient. Land-values are stationary. Speculation is confined within very narrow limits throughout the Western and Southern States; a vast amount of land is being purchased for investment, but moderate prices are being paid for it. The booming of towns is receiving timely check. There are now more town-booms in progress than can be carried on to successful termination. Investors have taken warning in time, and experts who are watching the tendency and developments say that investments are now being made with caution. At the same time, it must be kept in mind that a vast amount of money is going into land, especially into mineral and timber properties in the newer States. It must also be remembered that the promotion of industrial enterprises of all kinds is being followed out with great vigor, though there are fewer wild-cat enterprises now than last year. Heavy investments are still made by English capitalists. These investments, as well as those made by American capitalists, are in pursuance of the belief that a general and great expansion of lands is destined to be made in the United States within the next few years. Railway gross and net earnings for the first quarter of this year show an increase of from four to six per cent over last year. Clearing-house returns are also favorable, showing that the volume of business is once more pointing upward. On several systems of railways better freight-rates are being obtained than three months ago. Sharp competition exists between water and rail methods of transportation between Chicago and the East. There are fewer complaints of excessive freight charges now than for many months. The Interstate Commerce Commission has been rendering excellent services in its prompt and businesslike decisions, and transporters are beginning to learn about what is expected of them, and what they must do. The spirit of organization is still extending throughout the trades. Industrial associations are accomplishing good results in the regulation of production and in the maintenance of living prices. Competition is bitterly at work protecting consumers against unusual or excessive charges. The influences at work in trade are all in the right direction. The dangers which menaced public interests a year or two ago from trusts and giant corporations have grown much less, and do not annoy the little editors of the country as they used to. The iron trade is improving slightly, but still a good deal of capacity remains idle. The lumber business is not expanding as it did last year, but production has not been checked, and this fact leads to the expectation that there will be a break in prices later on, because of the accumulation of stocks in first hands. The hardware manufacturers of the East claim that their interests are being safely managed, and that a satisfactory distribution will be maintained all the year. Textile manufacturers are doing a good business. Hosiery and knit-goods manufacturers have been obliged to let a great many machines remain idle for some weeks. Stove manufacturers have immense stocks on hand. The manufacturers of agricultural implements look for a very heavy demand, because of the tendency among farmers to increase their area of cultivation. There is a steady expansion of the cotton area of the Southern States, and small industries continue to spring up under favorable conditions.



“WESTOVER” ON THE JAMES RIVER, VA.

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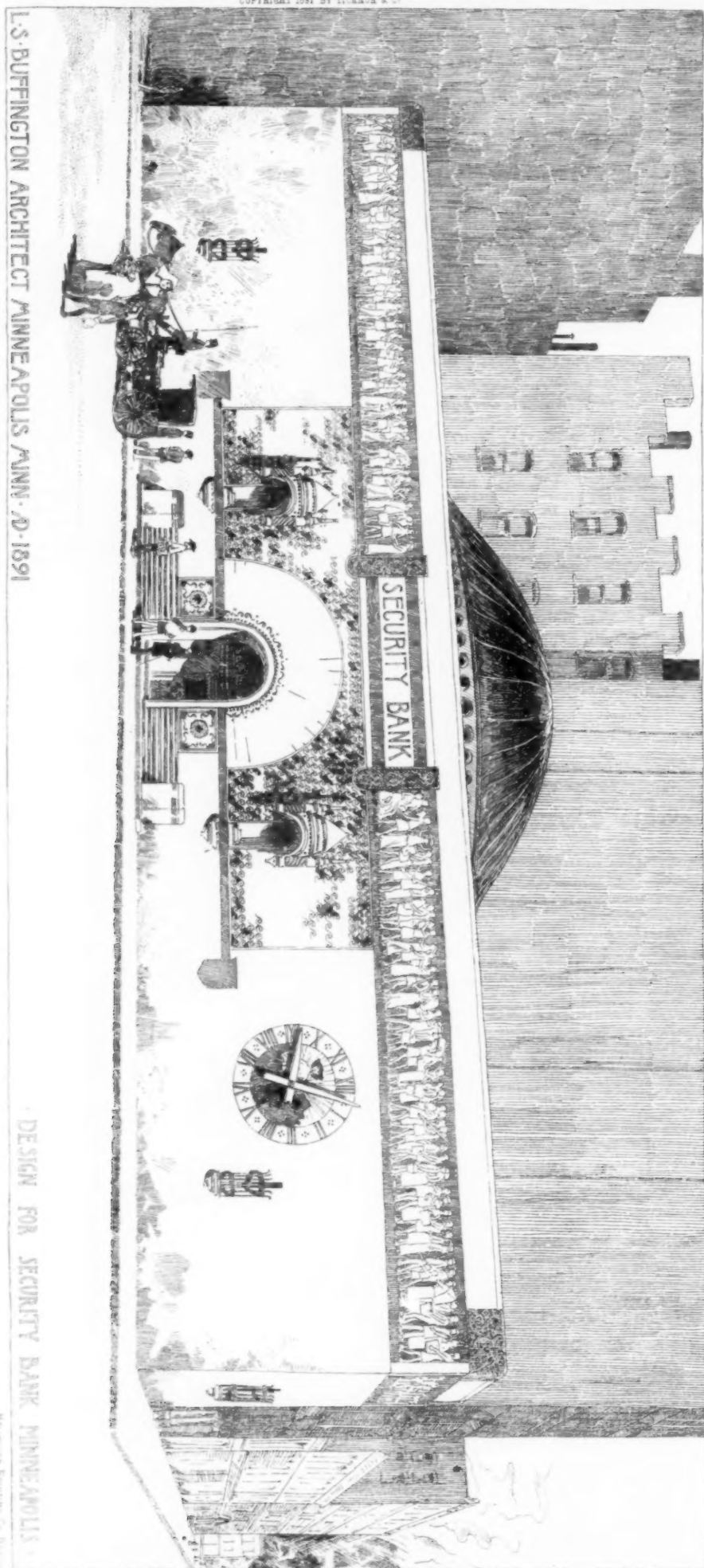
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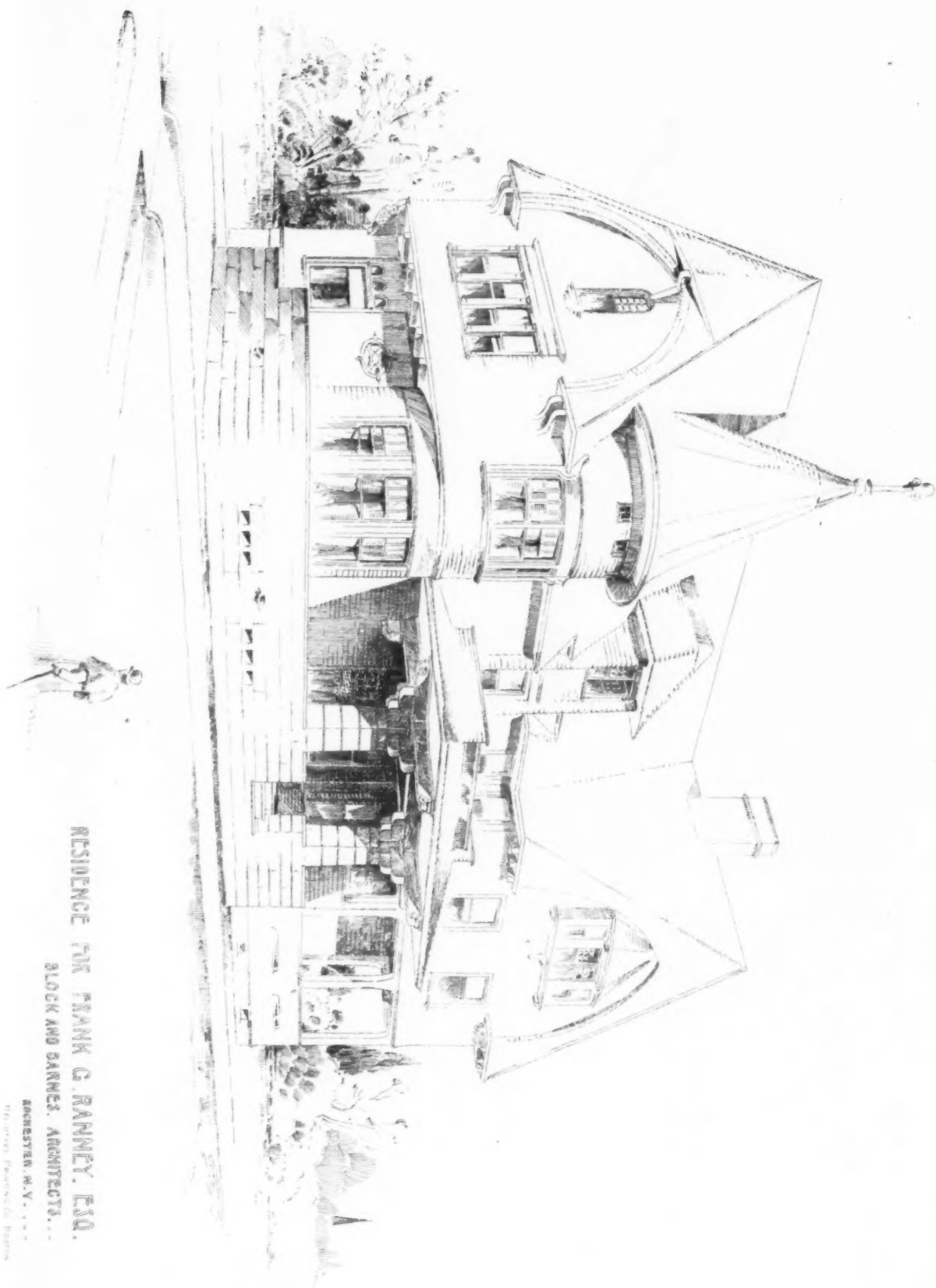


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