

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. LVII.

Copyright, 1897, by the AMERICAN ARCHITECT AND BUILDING NEWS COMPANY, Boston, Mass.

No. 1126.

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

JULY 24, 1897.



SUMMARY:—

The Tax on Art in the New Tariff.—The Tax on Lumber.—The Public Art League of the United States and the American Sculpture Society.—Public Buildings and Statues in Public Parks.—The New York Public Library Competition.—Fireproof Flooring.—American Architects as Imitators.—Restricting Open Floor-Area in St. Louis.—A Statue of Franklin for Philadelphia.—The Classes of the National Academy of Design.	29
PUEBLO ARCHITECTURE.—III.	31
JUBILATING LONDON: THE EXHIBITIONS.	33
NIPPUR.	33
BOOKS AND PAPERS.	34
ILLUSTRATIONS:—	
Church of Sta. Maria dei Miracoli, Brescia, Italy.—Pueblo Architecture.—House at Providence, R. I.—The German Hospital, Brooklyn, N. Y.—Monument to Emperor William I on the Kyffhauser Mountain, Thuringia, Ger.	
The Engelbrunnen, Vienna, Austria.—A Group of German Castles.	
Additional: Detail of Porch: Sta. Maria dei Miracoli, Brescia, Italy.—The Pompeian Court: Hotel Jefferson, Richmond, Va.—Gates in South Choir Aisle: St. Paul's Cathedral, London, Eng.—Details of Choir-stalls: St. Paul's Cathedral, London, Eng.	35
NOTES AND CLIPPINGS.	35

EVERY friend of American art will regret that the Tariff Bill, in its final form, contains the provision for a duty of twenty-five per cent on imported works of art which the artists of the country have protested against so earnestly. A curious exception is made in favor of pictures and sculpture intended "for permanent exhibition at a fixed place," the intention evidently being to permit the great museums to import pictures free; but, while this would answer a certain purpose if our museums were State institutions, with a fund for buying pictures, our American way is to let such museums depend entirely on private liberality, which has never yet failed them, and to encourage them to spend all, or most, of their fixed income on the work of caring for their collections and giving instruction to students, leaving additions to their artistic property to be made by gift or bequest from citizens. Under the new law, citizens will be unable to collect foreign works of art for themselves without paying the tax, and if they cannot buy them for themselves, they will have none to give or lend to the museums, so that the latter and the public must expect to see the process of accretion of artistic objects for their benefit, which has gone on so rapidly of late years, materially slackened. It is truly unfortunate that the fine-arts, whose refining and cheering influence is quite as valuable to the poor as to the rich, should have been utilized by cunning politicians to inflame the hatred and envy of people who think that they cannot afford to buy good pictures against those who are rich enough to do so, for the only way in which the former class has, in this country, ever been able to see good art has been through the generosity and public spirit of the latter class; and for every rich American who is prevented by the tax from buying a great and beautiful picture, at least five thousand of his poorer fellow-citizens will be deprived of the benefit that they would derive through seeing it.

ANOTHER feature of the tariff, as finally adopted, is the fixing of the duty on white-pine lumber at two dollars per thousand, with a proportional tax on manufactured wood-work. Of the deplorable effect which this enhancement of the price of pine is likely to have on the supply of that most precious material, the owners of which will obviously hurry to market every foot that remains, in order to take advantage of the artificial price made for it, we have already spoken, and nothing remains but for architects, owners and builders to consider what shall be used to take its place. Judging from present appearances, whitewood, poplar or tulip-wood, as it is variously called, must be for a time the ordinary substitute; but the tulip-tree grows wild only over a limited area in the Border States, and the supply cannot last many years, while the

timber is, itself, very much disposed to swell and shrink under alternations of dryness and moisture, and is brittle, subject to the attacks of worms, and disposed to rot. After the tulip-wood is gone, the Southern, or hard-pine presents, practically, the only resource for wood-workers, and it is a very poor one. For heavy timbers, Southern pine answers well, and for flooring, if properly cut and treated, it is suitable, but anything like fine moulded or carved work in it, particularly for the outside of buildings, is almost out of the question.

THE Philadelphia *Press* gives currency to an idea which is likely to do harm. The American Sculpture Society, which has for some time been much alarmed at the prospect that the production of works of art in this country might fall into the hands of some sort of "trust," or monopoly, and which has not been unreasonably scrupulous in its choice of means to oppose this tendency, finds, according to the *Press*, renewed cause for apprehension in the movement for placing the public art of the United States under the direction of an Art Commission. As our readers know, the Public Art League of the United States has for some time been endeavoring to enlist intelligent opinion in favor of the passage of an Act of Congress, under which the approval of a Fine-Arts Commission shall be requisite for the acceptance or execution of all designs for works of art, coins, bonds, currency and important buildings, to be paid for with public money, or set up in places belonging to the United States, it being provided that the Commission shall employ expert juries to make awards in case of a competition of designs. The proposed system is practically the same as that by which all other civilized nations encourage the arts, and protect the public against artistic imposition; yet the *Press* informs its readers that "a monopoly in sculpture work is being sought"; that "such a scheme . . . means the death of American sculpture," that the only people who favor it are "two or three persons interested in getting from the Government fat positions," and that "the American Sculpture Society will take every step to defend its rights." Whether one of the precious "rights" of the members of the American Sculpture Society is to coax Congressmen into voting appropriations for works of art which competent judges condemn, we will not undertake to say; but in regard to the "fat positions" which form the object of the people engaged in the movement, it may be well to observe that the bill which the Public Art League is now trying to have passed provides that the members of the proposed Fine-Arts Commission shall serve without pay, while most of them are not even appointed by the Executive, the presidents of the principal artistic bodies of the country forming, *ex-officio*, the majority of the Commission. The idea that such a body could contrive a monopoly of sculpture, even if any of its members were disposed to do so, is preposterous, and the American Sculpture Society, which, by the way, must not be confounded with the National Sculpture Society, is, to say the least, doing a very dubious service to the reputations of its members by its attempt to discredit in advance the judges before whom their work will probably be brought.

GARDEN AND FOREST has a very timely editorial on the necessity for resisting the encroachments which are being more and more made upon city parks, by the erection of public buildings in them. Of course, a public building should have a spacious site, but it does not therefore follow that a beautiful park should be spoiled to furnish it with one. *Garden and Forest* reminds us that the great use of parks in cities is to refresh the eye and mind with the loveliness of nature, and the obtrusion of architectural objects among natural forms produces a painful shock, recalling the tired observer from the restfulness of the wild freedom of nature to the cares of city life, which he longs for a moment to forget. In a large tract like the New York Central Park, a certain amount of artificiality is admissible in particular places, as in the Mall and the Terrace, the elaboration of which enhances, by contrast, the natural beauty of the lake and meadow close by; but Mr. Olmsted was careful to concentrate the architectural features which he designed in one place, and we may be sure that it was not in consultation with him that the Metropolitan Museum was permitted to degrade the middle portion of the Park into mere building-land.

EVEN statues, particularly when scattered around indiscriminately, do great injury to the beauty of a park. Every one remembers the feeling which the visitor to the Central Park experiences when, in turning a corner in some rustic path, he comes suddenly upon a gigantic bust, half overgrown with clematis and wild roses; or when, in looking into the depths of a lovely mass of shrubbery, he descries a group of writhing figures. So placed, the best statuary is worse than wasted, and it is hardly too much to say that the statues in American parks which could not, with advantage to the general effect, be replaced by rose-bushes, might be counted on the fingers of one hand. That works of sculpture have their use, in its way as important, perhaps, as that of parks, we are very far from denying, and, in fact, if we had our wish, statues would be more liberally used in cities than is now the case; but the beauty of sculpture and architecture can be made compatible with that of natural scenery only by special means, used with consummate skill, and until such skill is in full control of our parks, buildings and statues are best kept out of them.

ABOUT one hundred designs were received in the preliminary competition for the New York Public Library. Twelve of these are to be selected by the judges, who are Professor Ware, of Columbia University, Dr. John S. Billings, the Director of the new Library, and Mr. Bernard R. Green, of the Congressional Library. The authors of the six of these twelve designs which are adjudged the best will compete a second time, and six architects of reputation, who have not entered the first competition, will be invited to compete with them. From the twelve designs of the second competition the judges will select three, and the Trustees will choose, from these three, the person to whom they wish the execution of the building to be entrusted. It is estimated that the cost of the building will be about seventeen hundred thousand dollars.

THE Pittsburgh fire seems to have given occasion for a renewal of the important controversy as to the respective merits of terra-cotta and concrete as a filling between iron beams for fireproof floors. In a recent report on the fire, made to the insurance companies, one set of experts expresses much satisfaction at the behavior of the terra-cotta filling actually used, while a second set finds that the terra-cotta did not do what was required of it, and regrets that more stiffness was not given to the structures by the use of some form of concrete filling. We will not attempt here to discuss the rival systems, our own opinion being that either is good if well carried out, and that both are bad where the workmanship and materials are defective; but architects, who are sure to be called upon to design such floors on a great scale within the next few years, should keep their eyes and ears, particularly the former, open for the consideration of all matters affecting so important a subject.

THE *Record and Guide* has some remarks upon American architects and their architecture which are not deserved, and which are calculated to injure the profession in the eyes of the public. Speaking of the claim made in the daily papers, that the design for the Columbia College Library is similar to a Grand Prix design for a church, made in 1816, and published in one of the volumes containing those designs, the editor of the *Record and Guide* says that "a large part of the profession will even be surprised at the idea that copying another man's elevation should be regarded as irregular, or departing in any way from the healthy practice of a living art." In explanation of this extraordinary notion, the editor goes on to say: "Successful architects have too much to do to be preëminently artists, and to labor over the designs for their buildings. Before all else, they must be first-rate men of business, men strongly imbued with the commercial spirit, and to men of this nature, any labor-saving method or practice for economizing time naturally recommends itself very strongly."

WE do not like to make personal application of general observations; but, as the remarks of the *Record and Guide* are intended to apply particularly to the architects of the Columbia College Library, it is due to the latter to remind the *Record and Guide* that "successful" as they have been, no architects, perhaps, in the country, have been so distinguished for the care with which they have "labored" over

the designs for their buildings; and the profession, certainly, attributes their success to the very fact that their work, to the smallest detail, has been studied with a care which has considered nothing too insignificant for the display of thought and taste. That the Columbia Library should resemble a Grand Prix design is natural enough, for every architect studies the ways in which others have solved problems similar to that on which his attention is engaged, just as a painter studies and compares compositions suitable for a conception of his own; but it takes something more than a "commercial spirit" to adapt a plan for a church to the requirements of a design for a library, and we may be sure that on the variations from the original, even supposing the resemblance to be, as the *Record and Guide* says, "almost exact," plenty of artistic "labor" has been expended.

THROUGH the efforts, we imagine, of the fire-engineers, a clause has been introduced into the new building ordinance of St. Louis, providing that no mercantile building shall have a greater unbroken area in any story than seventy-five hundred square feet. This is certainly large enough,—too large, in fact, for safety; but complaint is made that the restriction "hinders the growth of business houses," and it is proposed to amend it by providing, in place of the limitation of the area, that spaces more than seventy-five hundred square feet in extent must be equipped with automatic sprinklers, and that elevator-shafts must be of fireproof material. In such cases, the wish or interest of the public is not much regarded, but the insurance companies will probably have something to say in opposition to the amendment. While automatic sprinklers would check a fire effectively in a comparatively small room, enclosed on all sides by walls, floor and ceiling, they would be an uncertain reliance in a modern department-store, open from ground-floor to roof, and it cannot be too often pointed out that with a fire once under headway in such a store, very few of the people who happened to be there would get out alive. Fortunately, however, the sprinklers would destroy goods almost as effectively as a fire; and a system under which the burning of a few yards of cotton cloth in one corner of the store might set the sprinklers in operation over acres of silks and velvets and ribbons is sure to meet with disapproval from the underwriters, whose interest, in such cases, agrees with that of the public in requiring the utmost possible limitation of open areas, whether protected by sprinklers or not.

A STATUE of Benjamin Franklin is to be placed on the Chestnut-Street front of the Philadelphia Post-office. The statue is the work of Mr. John Boyle, the architectural part being by Mr. Frank Miles Day, and the expense of the whole undertaking is borne by Mr. Justus C. Strawbridge. According to tradition, it was on the site of the present Post-office that Franklin stood when he brought down lightning from the clouds by means of a kite; and, as the first Postmaster-General of the United States, he would deserve commemoration in connection with the Philadelphia Post-office, even if he had never thought of flying kites. The spot is also the site of the house built for the official residence of President Washington, so that it is historically one of the most interesting places in the United States. The statue shows Franklin seated, and much curiosity will be felt in regard to it, as Boston possesses an excellent standing figure of him, by Greenough, with which Mr. Boyle's work will naturally be compared.

THE National Academy of Design has issued its programme of classes for the next season. There are to be three classes daily in drawing from the antique, three life classes, two classes in portrait and figure painting, one still-life class, a sketching class for an hour each day, and an etching class once a week. As usual, all new students must first enter the antique class on probation, and are promoted if they deserve it, or, if they are judged to be unfitted even for the antique work, are dropped from the school, and their entrance-fee is refunded. The entrance-fee is ten dollars for the season in all cases, but an additional fee of thirty dollars for the season is charged for admission to the portrait or still-life classes. The schools are under the general charge of a committee, consisting of Messrs. Edgar M. Ward, Francis C. Jones, James D. Smillie and Frederick Diehman. Messrs. Ward and Jones give instruction in the painting and drawing classes, and Mr. Smillie in the etching class.

PUEBLO ARCHITECTURE.¹—III.

MASONRY AND CONSTRUCTION.



Wooden Roof-drains.

THE results attained by the pueblo builder are the product of patience and industry, rather than of skill, and this is especially true of the masonry. The great walls which circumscribe some of the ancient ruins, sometimes three feet thick and hundreds of feet long, are composed of units so small that they may be termed minute. Such walls are invariably built of fragments of stone, often tabular in character, but never of a size larger than one man can handle easily.

In the first paper of this series it was suggested that pueblo architecture was the outgrowth of peculiar physical and social conditions in the country where it is found. The most important of these is the great abundance of suitable building material everywhere throughout it. The *mesas*, which are the prevailing topographic form, are flat-topped table-lands, composed of more or less thin strata of sandstone. The strata are of varying degrees of hardness and the *mesas* break down into the valleys by alternate vertical cliffs and long slopes of debris, composed of fragments split off from the cliff by frost and weather. The *mesas* may be considered as gigantic producers of building material, now and for centuries past engaged continuously in turning out stone for the pueblo builder, ready to use without further dressing or preparation. In short, the pueblo mason obtained his results principally by care in the selection of material, and even in this he has been outdone by the white inhabitants of the country. Near the village of Moen-Kopi, in Northwestern Arizona, the Mormons built a mill many years ago for the manufacture of the native wool into yarn and blankets. The venture was not successful and was soon abandoned, but the building still stands and illustrates the results possible to obtain in that country by mere selection of material.

Some of the ancient ruins exhibit masonry but little inferior to this, but nothing near as good can be found in modern work. The pronounced deterioration of the stonework which has taken place is strikingly illustrated in one of the walls in the village of Pescado, a summer establishment of the Zuñis. Here a modern wall was built over a fragment of ancient masonry, and the two can be seen side by side.

The ruins found in the valley of the Rio Verde, in Southern Arizona, exhibit masonry which is rude and primitive as compared with that found on the San Juan River, but it is superior to modern work. The builder there was at a disadvantage in regard to his material, but he selected the best obtainable and his walls were fair, although lacking the fine finish of the northern examples. Opposite old Camp Verde, and on the other side of the river there is a fine ruin perched upon a high hill and overlooking the valley for miles above and below it. The masonry is a fair example of the best type found in this region. The walls are about two feet thick, composed of fragments of limestone, laid in irregular courses. The stone, which was not dressed or prepared in any way, is of rather larger size than usual, and not a particle of mortar is visible on the exterior face.

In the ancient work, as well as in most of the modern examples, walls are composed of two faces of selected blocks with an interior filling of rubble. As a rule, no attempt to tie together the two faces of the wall was made, either by the use of long stones laid transversely in the wall, or by other means, but there is no doubt that

this expedient was known to the ancient builders. This construction is especially noticeable in the Chaco ruins, on a dry river of that name in Northwestern New Mexico. The walls now standing are massive and exceptionally well built. In the Pueblo Bonito, one of the largest ruins of the group, some walls are still standing to a height of nearly thirty feet, with a thickness of three feet at the base, and with an exterior finish that compares favorably with a modern brick wall. In this case, however, the result is partly due to careful chinking with small spalls, and to rubbing down the face of the wall after the stones were laid. The care bestowed upon these walls was unusual. Generally the ancient mason was content to lay up the best stones he could obtain, and to leave the wall without further finish. Even by this method excellent results were obtained, as shown in the old ruin of Kin-Tiel, on the road between Zuñi and Moki. The ground-plan of this huge ruin was shown in the last paper of this series. Although the stones composing the curved exterior wall were rubbed down in place, many of the inner walls were not so treated, yet the results are but little inferior.

The date of Kin-Tiel has not yet been determined, although it has probably been in ruins for over three centuries. It was one of the largest stone-built villages in Arizona, and one of the most elaborate in plan, and although now known under the name applied to it by the Navahos, it is claimed by the Zuñi Indians and doubtless further research will assign it to those people. There are many examples of similar masonry in the Zuñi country, some of known date, such as the remains of the old stone church in the ruin of Ketchipauan, near the pueblo of Zuñi. This was one of the famous "seven cities of Cibola," the search for which led to the discovery of what is now New Mexico and Arizona, and was conquered by Coronado in 1540. A stone church was built there afterwards by the monks, who always followed close on the heels of the soldiers, and perhaps a century later was abandoned, but the walls are still standing to a height of over ten feet.

Some of the best of the modern masonry is to be found in the village of Oraibi, the westernmost of the Moki group, in Northern Arizona. Here a white man is still something of a curiosity and the native methods of house construction have been but little modified by modern conditions. It is noteworthy that here the use of mud-mortar as an exterior plaster or finish is comparatively rare, and to this is probably due the preservation of much of the ancient methods and care in masonry construction.

As Pueblo masonry is almost entirely the result of selection of material there is a marked difference in walls, even of the same date. The masonry of the subordinate summer villages, and even of subordinate parts of the home village, is very much rougher and cruder than that of the permanent homes of the people. In some of the villages, and especially in Oraibi, the most primitive of all, there are many stone-faced terraces, constructed of such crude masonry that they form a striking contrast with the houses to which they pertain, rough as the latter are. The same type of construction is seen in stone corrals, retaining-walls to trails, etc.

In the construction of walls at the present day the stones are laid in a mortar composed of mud, used very sparingly. In some cases the stones are laid up dry, and the wall is not finished until the coming of the rainy season, when the water necessary for mixing the mortars can be procured from convenient pools near by. In such cases the mud, of the consistency of modelling-clay, or a little stiffer, is made up into little pellets, about the size of a walnut, and forced into the interstices of the stones with the fingers. This use of mortar is in its crudest form merely a variation of the ancient method of chinking with spalls, an almost invariable accompaniment of pueblo masonry, ancient and modern.

There is little doubt that the practice of plastering the exterior of the houses with mud, grew out of this use of pellets of clay for chinking, for the practice is of comparatively modern date, and the various steps which led up to it can still be seen in some of the cliff ruins, where the masonry has been sheltered from the weather and is practically in the condition in which it was left by the builder. In these ruins bare walls, clay-chinked walls, partly plastered walls, and walls completely hidden under a plastering of mud, are abundant; the last less abundant than the others.

The same mixture of clay and sand which is used as mortar in the masonry is employed in the construction of roofs and floors, and is also applied as an interior finish in rooms designed for living-rooms. For the latter purpose it is much diluted and is applied with the



Plastered Walls of Shupaulovi.

¹ Continued from No. 1117, page 61.

naked hand to the surface of the stones, always much rougher inside than outside. When it has been brought to a smooth, though not often even surface, by repeated applications, the final finish is obtained by washes of very thin clay, renewed at intervals of a year or less, as the condition of the walls may require.

Sometimes exterior walls are finished in the same way; in fact, among all the pueblos in the valley of the Rio Grande, and in Zuñi, this is the prevailing style. There is little doubt, however, that this method of finish has developed since the Spanish conquest, although perhaps known and slightly used before that time. To its extended use is largely due the deterioration of modern as compared with ancient masonry, for when a wall is to be covered less care is exercised in its construction. This use of mud, or adobe, as a finish is an entirely different thing from adobe construction, for so far as the available evidence goes the latter may be said to be a foreign introduction, and not of aboriginal origin.

The houses of Zuñi appear to be constructed almost entirely of adobe, yet a close examination shows that most of them are built of stone and finished with mud-plaster outside as well as inside. The universal use of this finish in Zuñi has brought about the use of peculiar devices to protect it, for it has but little durability. The walls must be provided with a raised coping, crowned with flat stones, to prevent the wash of rain-water over the edges of the roof, and often the roof itself is extended over the wall from one to three feet, forming a kind of projecting eaves, for the better protection of the side wall. The copings are generally but a few inches in height, but sometimes they are developed into regular partition-walls six to eight feet high. As a pueblo village is the result of a regular growth, room after room being added as needed, lines of coping stones cross the flat roofs at intervals, dividing it into irregular spaces and marking what were once the exterior walls.

The rain which falls upon the roof must be carried off, and for this purpose the raised coping is pierced at intervals and projecting drains are inserted. These are one of the most picturesque features of a pueblo village, being constructed of slabs of stone, hollowed pieces of wood, gourds, pottery pipes, in short, anything that will serve the purpose, including, in modern times, old tomato-cans or bits of stove-pipe picked up about the traders' stores. The best and most characteristic of these drains are formed of three flat stones arranged in the shape of three sides of a box or an open trough. An earth roof, while cool in summer and warm in winter, and admirably adapted to the means at the command of the pueblo builder, is easily washed out by heavy rains, and if not rapidly drained permits the percolation of water into the interior. Its weakest point is on the edges, and it is there that the destruction of an abandoned house begins.

While roof-drains such as those described serve their purpose fairly well on the first roof, above that level they must be supplemented by other devices, else, instead of preserving, they will rapidly destroy the roof below them. To prevent this, flat stones are placed on the roof below to receive the discharge, and often flat slabs are placed against the side wall to catch the splash and prevent the washing away of the finish. The necessity for such a device will illustrate how little durability there is to the mud finish, which has been described as quite equal to our own plastered walls.

Although nine-tenths of the houses of the Mexican population of the southwest are constructed of adobe, as are many of the present pueblo villages, that material is not properly a feature of pueblo masonry. Adobe construction, properly defined, consists of the use of moulded brick, dried in the sun, but not baked. Such construction has never been found in any ruin known to be of a date prior to the Spanish conquest of the country in 1540, and its occurrence is presumptive evidence of an occupation extending to a later date.

Adobe construction is admirably adapted to Southern Arizona, where there is practically no snow or frost, and almost no rain, and where the summer temperature often rises to 130 degrees, but notwithstanding its extended use in the northern part of that territory and of New Mexico it is not well suited to the climate of that region. There eternal vigilance is the price of shelter to the dweller in an adobe house, and should he leave his home even for a few months in the rainy season he will probably find it in ruin on his return.

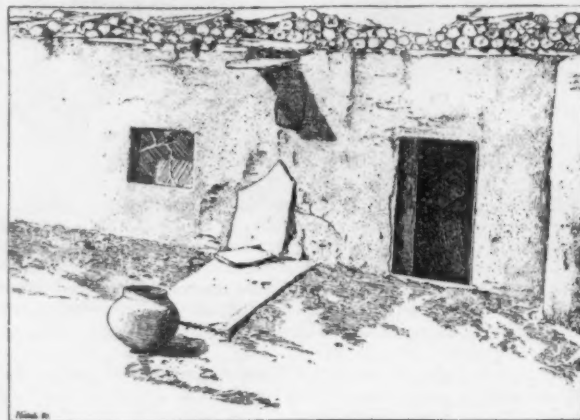


Trough Roof-drains of Stone.

While the appearance of many of the eastern pueblos is misleading, and many of the houses which present a smooth plastered exterior are really constructed of rough stone, yet there is no doubt that adobe is now used constructively also by them, perhaps owing to the proximity of numerous Mexican settlements. But the material has never found favor among the western tribes, possibly on account of the greater rainfall in that part of the country. There, indifference to this material cannot be attributed to ignorance of it, since for

several centuries they have had excellent specimens of adobe construction among them. The old church which occupies the central court of Zuñi was constructed of adobe and is still standing, although not used as a church for many decades. The bricks of which the walls were built were made with a liberal admixture of straw, and perhaps the absence or scanty use of this binding material has something to do with the flimsy character of modern work.

One of the best examples of the old adobe work is found in the ruin of Awatubi, some eight miles southeast of the Moki villages.



Zuñi Roof-drain, with Splash-stones on Roof below.

This place was the site of a Spanish mission, but was destroyed in the last years of the seventeenth century, and never afterwards occupied. For over two centuries the old walls have been exposed to the weather, and they are still standing, but they are of Spanish origin, or at least were built under Spanish supervision. The bricks of these walls also were made with plenty of straw. In the old ruin of Hawikuh, the first discovered of the "seven cities of Cibola," located some fifteen miles southwest of Zuñi, there is an adobe fragment of great interest. The village proper was constructed entirely of stone, and occupied the point of a hill, but immediately under it, in the valley below, a church was constructed soon after the conquest. The place was abandoned prior to 1680, but the walls of the church, although much eroded, are still standing to a height of over ten feet in places. In both this and the previous example the work is far superior to any of the native work, which is always quite flimsy.

Flimsiness is one of the characteristics of modern pueblo masonry, and these builders have never been able to realize that adobe walls will not bear the weight of stone walls of equal thickness. Stone walls are often seen in the ruins, still more often in the modern villages, which are less than eight inches in thickness, and adobe walls are found even thinner. It has already been explained that the many-storied houses of the pueblos are the result of growth, and not of intelligent design on the part of the builders. Seldom, if ever, is any provision made in a lower wall for the additional weight which it will have to sustain when further stories are added above it, and the result of this lack of foresight is often disastrous. A few years ago a considerable portion of one of the huge house-clusters of Zuñi fell in from such overloading, but the accident conveyed no lesson to the Zuñi builders, for it would be attributed to the disfavor of the gods, rather than to lack of foresight in their ancestors or lack of knowledge in themselves.

The well-known Casa Grande ruin on the Gila River, in southern Arizona, has often been referred to as an example of aboriginal adobe work, but the term, as applied to that method of construction, is a misnomer. The ruin has a clear historical record of over two hundred years, but the walls are still standing in places to a height of over twenty-five feet, with a thickness at the base of over four feet. They are composed of huge blocks of rammed earth, three to five feet long, two feet high, and three to four feet thick. These blocks were manufactured in place on the wall, from material obtained in the immediate vicinity of the building. The courses or horizontal joints can still be seen distinctly on the western front, and the vertical joints can be made out here and there. The blocks which compose the wall were probably made with the aid of a rude box or frame of timber and wicker-work, which was moved along the wall as the work progressed, but the masonry bears no resemblance whatever to adobe work. There is no reason to suppose that the Casa Grande is not purely aboriginal, both in design and execution.

The rammed earth construction of the Casa Grande is well adapted to the region where it is found, and even at the present day, after more than two centuries of exposure to the weather, the surface is almost as hard as sandstone and as durable. In planning for the preservation of the ruin, an appropriation for which was made by Congress some years ago, the writer found that the surface erosion was so slight that it could be ignored, and that practically the only danger came from sapping of the walls at the ground level. This was overcome by underpinning with hard brick, faced with cement.

The interior finish of the walls in Casa Grande is remarkable. Mange, the military secretary of the Padre Kino, who saw and described the ruin over two hundred years ago, was struck by the excellence of the interior finish, which, he said, shone "like pueblo pottery," and every one who has since inspected the walls has been similarly impressed. Certainly a finish which has endured so well an exposure to the weather of over two centuries reflects much credit on the mason who executed it. How this finish was obtained is not now known.

The characteristic feature of the pueblo stone masonry, pronounced in ancient examples and more or less present in all, is a system of chinking with small stones or spalls. In modern walls observed while under construction in the Moki villages, stones of fairly regular size were laid up to the full height of the wall, and afterwards bits of flat stone were driven into the interstices with a heavy stone maul. This was done here and there, apparently without design, but in the finest examples of the old masonry it was done with regularity and system, and some of the walls in the Chaco ruins present a beautiful mosaic-like effect, alternating with bands of plain heavy stones. This effect was produced by the careful use of selected spalls, and is a real decorative feature, but as this phase of pueblo art will be treated in another paper of this series, it need not be described here.

COSMOS MINDELEFF.

[To be continued.]

JUBILATING LONDON: THE EXHIBITIONS.

IT is not often that one sees such a poor show of pictures at the New Gallery in Regent Street as the one now on. Of course, in a collection of some 400 works many must, forsooth, be of first-class merit; but the rank and file are terribly mediocre. Mr. Sargent's "Study by Lamplight of Mrs. George Batten, singing," is a *tour de force* in color and drawing. An upturned face with open mouth, showing the teeth, does not sound fascinating, and if few artists would dare to paint a portrait thus, still fewer ladies, one would think, would like to be so represented. It is certainly a success from the technical point-of-view, but hardly a work of art, if art consists in the search after beauty of form. Mr. Shannon has, on the other hand, scored a great success in his artistic portrait of the "Marchioness of Granby," whose beautiful face is swathed in drapery, with a background of a circular medallion of Della Robbia ware, forming a kind of nimbus. The lady is looking up from her sketch-book, which gives the impression of her being seated in a museum or art gallery.

Another exquisite work — the most beautiful landscape in the gallery, is Mr. Fred Hall's "Drinking Pool": some cows and a little girl crossing a field, with the glow of the setting sun upon them, and the rising summer moon just appearing behind the hill. The only thing which can be said against the work is, that the influence of the Belgian painter, M. Claus, is a little too apparent; but Mr. Hall is young, I believe, and could not find a better master in sunlight-effects than the Belgian painter. A little collection of sunny studies in various parts of the Riviera, by Mr. F. Rawlence, is on view at the Fine-Art Society's rooms, together with some low-toned sketches in the neighborhood of Rome by Signor Carlandi — all worth seeing.

The Japanese sketches and pictures by Mr. Mortimer Menpes are marvellously clever and original. Many of them are daring effects of artificial light — on the stage, in tea-houses and shops. Some are large, with broad sweeps of brush-work — others, the most minutely finished little pictures only a few inches square; and, strange to say, the latter are in oil, and the former mostly in water-colors, or *gouache*. A procession of priests and another of archers are most notable effects of bright color, with thorough characterization of individual expression — indeed, this is one of the points so successfully obtained by the painter. Whether his model be an artificer modelling his clay, or a worker in cloisonné enamel, or a little chubby child, or a weather-beaten worn-out old woman, the character of the individual is maintained. Daring are the studies of actors in the full glare of stage-lights, exhibiting the most violent contortions; and equally clever, the charming little episodes of domestic life, such as the "Flower of the Family," a little child under an umbrella, in full sunlight with a background of blossoming fruit trees.

Possibly the murky state of the atmosphere may have something to do with the dulness which besets one at the Royal Academy. The exquisite clear air and clean sky of the Jubilee days seem to have been too exhausting for the weather-god to keep going for more than a few hours, and consequently they have given place to dirt, gloom and general dismalness. The stands are being dismantled, and London has the appearance of a person going home in the early morning in dress clothes, but draggle-tailed, and more or less drunken.

A few exquisite full-moon-at-sunset landscapes, with sleepy cows courting rest, stand as companions to the work of Mr. Orchardson and Mr. Sargent. Never has the former sent better work. His portraits show that marvellous richness of color without, as it were, any paint; and that no less extraordinary power of modelling without shadows. His work is light, luminous and brilliant, and one cannot tell how or why, surrounded, as it is, with pictures upon which tints are loaded one upon the other, apparently to correct mistakes. Mr. Orchardson's peculiar style is eminently that of doing as little as possible to obtain the greatest possible effect. He knows exactly what he wants, and he arrives at completion by the

simplest means. He may possibly paint a face a dozen times before he is satisfied, but he is careful to erase it, and repaint it from the commencement. Hence, that richness of tint which it is impossible to obtain by repaintings one over another.

Mr. Sargent's portrait of "Mrs. Miers and her Children" is a wonderful piece of perfect technique, with all the distinction of the eighteenth century world about it. The picture has called forth any amount of favorable and adverse criticism, but whether one likes it as a picture or not, the fact remains that it is as masterly a piece of work as the painter's "Mrs. Hammersley," now at the Guildhall Exhibition, and how thankful the weary plodder round the Royal Academy walls ought to be to find a masterpiece! There are the old, old domesticities; the worn-out sentiment; the prettinesses of by-gone days — but withal, a frightful amount of commonplace. Where are all the new men — and women, one may ask? for the Victorian Exhibition shows us numberless works by the latter, which ought to be recognized at Burlington House. What an advance in women's artwork in the last forty or fifty years! and a look into the sculpture gallery at the Royal Academy proves that in that branch also, great strides have been made. Some of the best examples of sculpture are by women — presumably Royal Academy students.

The Grafton Gallery shows a most interesting collection of dramatic notables and their belongings — watches, books, play-bills, and innumerable *et ceteras*. The pictures are various; but one sees once more what an excellent painter Hoppner was, scarcely inferior to Romney. The former's Mrs. Taylor as "Miranda" (in the costume of the day, 1758-1810), and the latter's beautiful "Miss Mellon" (Duchess of St. Alban's) are both masterpieces. Here, also, is Mr. Sargent's gorgeous "Ellen Terry as Lady Macbeth"; and that little gem by M. Dagnan-Bouveret, of "Coquelin cadet," M. Madrazo's spirited "Coquelin aîné as Don César de Bazan," and Mr. Whistler's "Sir H. Irving as Philip II of Spain" are also masterpieces of portraiture.

If the number of exhibitions is a sign of prosperity, artists and dealers ought to be coining money; but we are told that never was such a bad time known as this year of jubilation! Probably carpenters and timber merchants think otherwise; will not they in their prosperity patronize the poor starving artists? S. BEALE.

NIPPUR.

A LONG and interesting account is given by a correspondent in the London *Times* of June 24th of the discoveries of the Haynes expedition in northern Babylonia. The writer says:

"To have unearthed the ruins of the oldest city in the world, the foundations of which were laid some six or seven thousand years before the Christian era, is a reward of which an explorer might indeed be proud. Such good fortune seems to have fallen to the lot of Mr. Haynes, who for nearly five years has been in charge of the American expedition engaged in excavating the great mounds of Nuffar, in northern Babylonia, the site of the ancient city of Nippur, the sacred city of Mul-lil, or the 'Older Bel' of the Semites.

"The history of the expedition which since 1888 has worked upon this site is a remarkable one; and its great work has been so quietly done that it has attracted but little attention except among students of Assyriology. The work was undertaken by the University of Pennsylvania, the funds, which have amounted to about \$70,000, being provided by a small committee interested in the work. The expeditions of 1888-90 partook rather of a prospecting survey and were under the direction of Dr. Peters. The trial trenches produced a harvest of about 10,000 tablets and inscribed objects, among them several records of Sargon I and his son Naram-Sin, whose date, 3800 B. C., was by many regarded as the starting-point of Babylonian history. Troubles among the Arabs and the usual difficulties with the Porte delayed the work for three years. In 1893 the explorations were renewed under the charge of Mr. J. H. Haynes, and they have been carried on continuously ever since, and have produced results such as were never dreamed of even by the most ardent advocate of Babylonian explorations, and the history of civilization has been carried back to an antiquity never thought of. . . .

"The great mounds of Nuffar are situated on the east bank of the now dry Shat-en-Nil, a great main-artery navigation canal which once connected Babylon with the Persian Gulf. The central feature of the ruins is a vast conical mound — called by the Arabs Bint el Amir, 'the Amir's daughter,' which rises to a height of nearly twenty-nine metres above the surrounding plain. This mound marks the site of the great *ziggurat*, or temple stage tower, first built by Ur-Gur, or Ur-Bahu, as he was formerly called — about 2800 B. C., and subsequently repaired and added to by later kings. This vast structure was the central point of the explorations by Mr. Haynes.

"We have long been familiar with another of the great stage towers, erected by Ur-Gur at Mugayyar, the ancient Ur; but the one at Nippur is the first that has been thoroughly explored. The tower rests on a basis 59 metres by 39 metres, and is built, like most of these Babylonian towers, with the angles to the cardinal points. It appears to have consisted, like that of Ur, of three stages only, not seven, like the later towers at Babylon and Khorsabad. Each stage had a thick coating of plaster, composed of clay mixed with chopped straw; and to protect the lower stage from the winter rain it was faced with kiln-burnt bricks and a coating of bitumen. The ascent was on the southeast side, and here it would seem Mr. Haynes has made a most important discovery. Two walls of burnt brick,

3.40 metres high, 16.32 metres long, and 7 metres from each other, were built out into the temple court-yard, and this causeway was filled-in with crude bricks, and formed a broad roadway leading up to the tower. The whole temple enclosure is surrounded by a massive wall, of which more than thirty courses are still visible.

"The arrangement of this temple and tower of Ur-Gur bears a most striking resemblance to the early Egyptian pyramids, especially Medum and the stepped pyramid of Sakkara, while the causeway recalls that of the second pyramid of Khafra, which connects it with the so-called Temple of the Sphinx. The question often suggested by archaeologists has been, were these stepped pyramids connected with the temple towers of Chaldea or borrowed from them? There is now, however, a possibility of our reversing this question, in the light of these discoveries at Nippur. The pyramid we know was but an elaboration of the Mastaba, and the resemblance between these and the towers at Ur and Nippur is most striking. Dr. Hilprecht and Mr. Haynes maintain, upon very good grounds, that Ur-Gur was the first to build these *ziggurats*, and there is certainly no trace of such edifices in any of the older cities, those at Tello or Lagash and Abu Habba, the ancient Sippara, being both later. At no period in early Chaldean history was there so close a contact between Egypt and Chaldea as during the dynasty of Ur-Gur Dungi and Gudea of Lagash. These rulers, as we know from their numerous inscriptions found at Tello by M. de Sarzec, were in constant communication with Egypt by sea and through the Sinaitic peninsula.

"In the face of this evidence from Nippur we may have to reconsider the question of Chaldean influence on Egypt, and, indeed, possibly reverse the old theory. The tower rests upon a massive brick platform of crude brick. Excavations conducted below this revealed the existence of a second pavement of much finer construction, being built of kiln-burnt bricks of great size—the dimensions being 50 centimetres square and of great thickness. Nearly the whole of these bricks were inscribed, and bore the stamps of Sargon I and Naram-Sin, his son, and its date, therefore, is just a thousand years prior to the buildings of Ur-Gur—namely, 3800 B. C. From the inscription of both these kings we know that they both built large portions of an older temple of Mullil, for the bricks bear the inscription, 'builder of the temple of Mullil,' and dedicated a number of vases to the temple inscribed with their legends. These buildings have been entirely removed, and the surface of the vast platform levelled for the reception of the edifices of Ur-Gur.

"Of the old temple there is evidence afforded by a discovery to which we shall shortly refer. Proof, however, of the great buildings of Sargon and his son is afforded by some excavations to the northwest of the temple. Here was a line of mounds which marked a rampart, and Mr. Haynes in 1895 cleared a portion of it and unearthed one of the most extraordinary pieces of masonry ever discovered. The foundation consisted of a solid bed of clay mixed with straw and puddled down, resembling some of the constructions found by Dr. Schliemann at Hissarlik. Upon this foundation and plinth was constructed a solid brick wall, fifty-two feet in thickness and rising to an unknown height. The builder of this wall was Naram-Sin, whom so many have regarded as a mythical king. It is probable that this rampart formed also a broad roadway round the city, and it may possibly, as Mr. Haynes suggests, have had a row of chambers in its upper part. A similar wall, but less than half as thick, was found by M. de Sarzec at Tello.

"Directly to the southeast of the great tower and close to the great rampart Mr. Haynes discovered a chamber, 11 metres long, 3.54 metres wide and 2.60 metres high. As there was no doorway, it was evidently a vault entered from above. Its floor rested upon the platform of Naram-Sin, and it formed a communication between the two strata. The inscribed bricks proved it to have been built by Ur-Gur. What was its purpose is explained by the discovery of a second chamber of the same kind immediately below it. In this second chamber a brick stamp of Sargon was found imbedded, and broken stamps and some few tablets were found in the room. The explanation is now easy. Around the walls ran a narrow shelf, on which some tablets and brick stamps were found. The chambers were the archive chambers of the temple; the smaller one, that of Sargon, which had been partly restored by Ur-Gur, while the second was that of the King, built up to the level of his own pavement.

"It is clear that at some time between the time of Ur-Gur, 2800 B. C., and the rise of the Kassite dynasty, 2200 B. C., the archive chamber had been broken into and large numbers of objects carried away and the rest broken and scattered. There can be little doubt that this disaster took place during the terrible Elamite invasion in 2285 B. C., when all the principal temples were pillaged and their treasures carried to the Elamite capital. . . .

"Mr. Haynes, encouraged by the success of his work in the upper stratum, proceeded to excavate to reach the virgin soil, which he did at the depth of 9.25 metres, passing through the debris of ruined buildings, accumulations of broken pottery, and fragments of inscribed stone objects and well-constructed drains. These remains prove the existence of at least two temples below the pavement of Naram-Sin, which at the most rapid rate of debris accumulation cannot be assigned to a later date than between six and seven thousand years before the Christian era.

"This lowest stratum has been much disturbed and the buildings pillaged; still, sufficient remains to reveal to us earlier phases of Babylonian civilization than we have ever seen. The first structure

discovered was an altar of sun-dried bricks, 4 metres by 2.46 metres. The upper course had a rim of bitumen, and upon the altar was a large deposit of white ashes. Around the altar was a low wall marking the sacred enclosure. Outside of this enclosure were found two immense vases of terra-cotta. These great specimens of early pottery were each 63.5 centimetres high and decorated with rope pattern. We have here in this simple, sacred precinct the germ from which the great temples of Chaldea—the altar, with its terminos, entered only by the priest, and the two great vases for purification, replaced in after-times by the greater and lesser *absu*, placed before the temples. A somewhat similar construction was discovered at Sippara, but its archaeological value was not recognized. Southeast of the altar was found a remarkable structure, a brick platform, 7 metres square and 3.38 metres high, built of fine, unbaked bricks. Around the base of this Mr. Haynes found a quantity of water-vents, which indicated a connection with some receptacle below, and on sinking beneath this solid mass he found a drain passing underneath the platform, in the roof of which was the earliest known keystone arch. It is 71 centimetres high and has a span of 51 centimetres. The bricks are well baked and joined with stiff clay as mortar. Thus the priority of Chaldea in the use of the keystone arch is clearly established.

"This structure was over 7 metres below the pavement of Ur-Gur and 4.57 below that of Naram-Sin, and, since there were no massive *ziggurats* or great temples to crumble into ruin, it must have taken many centuries to build up so great a mass of debris, and an estimate of from 1,500 to 2,000 years before the time of Sargon does not seem too high.

"Over 26,000 tablets, as well as numerous inscribed fragments of vases and *stelae*, have been recovered from this site. It must be remembered that the record chambers of both Sargon and Ur-Gur were sacked by the Elamite invaders of Kudur-Nakhunte in 2285 B. C., and this will account for so few inscribed records being found in the lowest strata. That, however, there had been numerous records of the pre-Sargon period which had been removed to the treasury of Sargon, and subsequently to that of Ur-Gur, is shown by a most important find. Under a pavement of Ur-Ninip, a King of the dynasty of Ur-Gur, were found quantities—some hundreds—of broken vases and other objects that have been votive offerings to the shrines of Mullil from the earliest times. . . .

"All of these records relate to a series of primitive wars and form certainly, whatever their age may be, the oldest historical records known. The earliest of these is the inscription of 'Eshagsagana,' written in most archaic characters—this monarch is styled 'Lord of Kengi,' that is, Lower Babylonia, 'the land of channels and reeds.' In his time the chief enemy of Babylonia was the city of Kish, the modern El Hymer, whose priest ruler had entered into alliance with some fierce tribes called 'the hosts of the Land of the Bow.' . . . The closing episode of this first of wars is supplied by a monument discovered by M. de Sarzec at Tello, the celebrated *stela* of the Vultures, now in the Louvre. In this monument erected by the King of Lagash, when a dynasty of kings was established after that of Ur, we have the record illustrated by sculpture of the King, who made a victorious campaign, and utterly defeated the 'hordes of the Land of the Bow.'

"After this, neither in the campaigns of Sargon or his son, nor in any chronicles of the Babylonian empire, have we any record of these people. Who were they, then? Professor Hilprecht has put forward, in a most dogmatic manner, a theory that they are to be identified with the Semitic tribes of North Mesopotamia, and that the 'City of the Bow' was Harran. He cites no ancient authority, no pre-Sargonic mention of Harran, but only a statement of Albiruni 'that Harran was built in the form of a crescent moon,' and that the plan of the ruins resembled a bow. It is surprising to see so brilliant a scholar using so feeble an argument. It is rather to the plains of Central Mesopotamia and the lowlands between the Tigris and the Kurdish mountains that we must look for the home of these nomadic warriors.

"We have been able to give only a brief account of the wonderful work of this campaign, which reflects so much credit on its organizers, and, above all, on Mr. Haynes. For thirty-two months he lived alone among the wildest Arab tribes in Mesopotamia, in an atmosphere of fever varied with cholera. One determined, but fortunately unsuccessful, attempt was made upon his life; yet amid all these surroundings he lived and did the work of three men. It is no overpraise to say that Mr. Haynes is justly entitled to take his place in the front rank of explorers along with those who have restored to us the first chapters of the world's history."

BOOKS AND PAPERS

WITH very slight ingenuity one can make tabulated statistics serve for the support of a position wholly at variance with that had in mind by the statistician who has spent so much time and research in preparing his tabulation. Here is Mr. Sachs, who has showed great ingenuity in compiling the statistics relating to "theatre fires," and has succeeded in producing some disheartening results—appalling results, if you will, and yet if those who contemn

theatre-going as an ungodly waste of time are tempted to use the figures as proof of the great physical danger which is added to the moral harm, as they see it, it will be well for them to take a second thought, as the figures can be made to show that there are few places where a few hours can be occasionally spent with greater bodily safety than in a theatre seat.

If, like the man who always went to the circus in hopes of seeing the lion-tamer eaten up, one should make it his business to attend nightly theatre performances in different parts of the globe, he would have a reasonable chance of enjoying the excitement of getting, or trying to get, out of a burning theatre at least once during his lifetime.

Taking Mr. Sachs's statements as they stand, we find that during one hundred years there have been only fifteen "theatre fires" in Boston, which caused the death of six spectators and two firemen, or a total sacrifice of eight lives to Terpsichore and her sisters since February 2, 1798. Now an occupation or amusement which causes the loss of one life only every twelve years seems to be tolerably safe and one that can be indulged in without so much foreboding as would neutralize the anticipated pleasure. If we allow to each of the twenty theatres in Boston an average attendance of only 500 at each of 200 performances, we find that during twelve years 23,999,999 persons have attended theatrical performances in Boston and escaped with their lives. Now, as it seems quite impossible for 24,000,000 persons to spend two hours in any identical manner without one or more of them dying through "natural causes," it might be argued that theatre-going was an exceptionally safe occupation. This computation is but a sample of the foolish use that can be made of statistics, and how from even the most reliable of these the most absurd results can be deduced. But it also points out how common it is in dealing with statistics like these, to fix attention on the unpleasant, and often appalling, total loss of life without paying due regard to the really infinitesimal ratio between actual and possible loss.

It is unquestionable that great loss of life has fallen on theatre audiences at wide intervals; that this loss of life has generally, if not always, been wholly due to remediable defects in planning and construction; that many theatres to-day contain radical defects that may at any time duplicate the disasters of the past, and that it is only by calling attention to possible consequences in statistical or spectacular form that responsible authorities can be brought to compel the correction of the imperiling defects. For these reasons the tables prepared by Mr. Sachs are useful, although their most apparent value is merely historical and chronological.

The book,¹ containing only some sixty pages, is printed in the same size and form as the earlier and much larger work — one which will probably become the standard work on the subject — "*Modern Opera-houses and Theatres*," prepared by Mr. Sachs in collaboration with Mr. E. A. E. Woodrow, and published by another house.

This statistical index is introduced by a full account of the burning of the Charity Bazaar in Paris, May 14 last, which seems rather out of place and has the air of being introduced as a "timely" expedient for forcing a temporary sale for the work. It appears, however, that the Bazaar building was originally built for a species of theatrical performances, and had originally a stage and raking floor, so the description and discussion are not wholly out of place.

A LITTLE publication² of a certain use to laymen has been prepared by the publishers of the *Scientific American* in which a score or two of photographic views of inexpensive cottages have been brought together, illustrated more or less clearly with sketch-plans. Whether the same views have formerly appeared in the *Building Edition of the Scientific American* we do not know, but they are of the same general character, and the usefulness of this publication lies simply in the fact that it exhibits a number of cottages of about equal cost designed by different architects, so that an intending builder has a fair chance to make a selection of the professional talent he would like to employ.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

CHURCH OF STA. MARIA DEI MIRACOLI, BRESCIA, ITALY.

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

THE name of the architect of this church has not been handed down to us. Indications point to some master of the Venetian school, probably Pietro Lombardo, or Scarpagnino, as the designer of the plan. All we know is, that in 1487 the construction

¹ "*Fires and Public Entertainments*," a study of some 1,100 notable fires at Theatres, Music-halls, Circus Buildings and Temporary Structures during the last 100 years. By Edwin O. Sachs, Architect, F. R. S. S. London: Charles and Edwin Layton. 1897.

² "*Inexpensive Country Houses, \$1,000 to \$5,000*." *Scientific American Architectural Series*. New York: Munn & Co. 1897.

was already under way, and that in 1488, one Jacobo made provision for certain enlargements. Burkhardt, who in his "*Geschichte der italienischen Renaissance*," 2d edition, page No. 123, gives the ground-plan of the edifice, calls it a "centrifugal structure," a "fragment of splendor gone mad." The plan is very peculiar: a square nave, subdivided by four pillars into nine squares, of which four are surmounted by domes differing from each other in dimensions, giving the whole an air of whimsicalness rather than that of a serious solution of an architectural problem.

Of far greater moment, artistically, than the interior is the main façade, fronting on a narrow street, the Corso Vittorio Emanuele, it being, at least in part, one of the most sumptuous performances in the decorative Renaissance style. This façade owes its origin to the labors of several architects, who were successively engaged upon it. The central portion, erected about 1505, which is the older and finer part of the façade, is undoubtedly the work of Gian Gasparo Pedoni, of Cremona. Four high pilasters, lavishly ornamented, flanking an entrance porch of most peculiar design, with a slender Venetian gable over it, the style of the structural frame-work, the lack of correct feeling for the logic of architectural forms, notwithstanding the great beauty of detail, all these points are readily explained by the Venetian origin of the work. The upper story, as also the bare side-wings, which latter stand in no organic relation whatever to the interior of the building, are later additions, dating from 1612. The dry and uninteresting architecture of these later portions, which it has been sought to enliven by the addition of clumsy urns and vases, and by statues over the side doors, shows the difficulty of the task of completing, with straitened means, an edifice begun in too lavish and expensive a style.

PUEBLO ARCHITECTURE.

THESE illustrations and those of the article elsewhere in this issue are reproductions from the "*Annual Reports*" of the Bureau of Ethnology.

HOUSE FOR MR. P. O. CLARKE, ARCHITECT, PROVIDENCE, R. I.
MESSRS. CLARKE & SPAULDING, ARCHITECTS, PROVIDENCE, R. I.

THE GERMAN HOSPITAL, BROOKLYN, N. Y. MR. R. L. DAUS,
ARCHITECT, BROOKLYN, N. Y.

MONUMENT TO EMPEROR WILLIAM I ON THE KYFFHAUSER
MOUNTAIN, THURINGIA, GER. PROF. BRUNO SCHMITZ, ARCHITECT.

THESE illustrations, which are copied from the *Deutsche Bauzeitung* and Rückwardt's *Architekturschatz*, show one of the many memorials erected to the memory of "William the Great," as he may in time be known. The figure of "Barbarossa," to which we lately referred, was modelled by the sculptor Nicolaus Geiger, of Berlin, while the equestrian statue of the Emperor, 26 feet high, was modelled by E. Hundreisser, of Charlottenburg.

[The following named illustrations may be found by reference to our advertising pages.]

THE ENGELBRUNNEN, VIENNA, AUSTRIA.

A GROUP OF GERMAN CASTLES.

[Additional Illustrations in the International Edition.]

DETAIL OF PORCH: STA. MARIA DEI MIRACOLI, BRESCIA, ITALY.

[Gelatin Print.]

THE POMPEIIAN COURT: HOTEL JEFFERSON, RICHMOND, VA.
MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

[Gelatin Print.]

GATES IN SOUTH CHOIR AISLE: ST. PAUL'S CATHEDRAL, LONDON,
ENG.

DETAILS OF CHOIR-STALLS: ST. PAUL'S CATHEDRAL, LONDON, ENG.



END OF A FAMOUS GUILD. — A private act of Parliament has just been passed to extinguish the once famous Guild of Literature and Art, and I understand that whatever property appertains to it is to be transferred to the Royal Literary Fund. This guild was founded about

1851 by Dickens, who worked zealously for it, acting, speaking, writing, and generally touting on its behalf. The first Lord Lytton was the President, and the then Duke of Devonshire (who died in 1858) and other personages of "light and leading" were induced to support it in various ways. Nothing could exceed the enthusiasm of Dickens for some time; and about £4,000 was raised (mainly by the performances of his amateur company), while Lord Lytton gave some land at Knebworth, on which "free residences for members elected in this foundation" were built. In the end all kinds of difficulties arose, the funds were inadequate to provide annuities of befitting amount, and the "professional members" positively refused to live in the "free residences" at Knebworth. The original scheme of the guild was on far too ambitious a scale, and no serious attempt was ever made to carry out the preposterously extravagant projects set forth in the prospectus. There lies before me a copy of the playbill of one of the performances of the amateur company in 1852, in which it was announced that the object of this Guild of Literature and Art was "to encourage life assurance and other provident habits among authors and artists; to render such assistance to both as shall never compromise their independence; and to found a new institution where honorable rest from arduous labor shall still be associated with the discharge of congenial duties." There is something at once melancholy and ludicrous in the ignominious collapse of a scheme which was started amidst such prodigious trumpetings. One grave defect in the original management of the Guild was the arrangement by which Dickens and his "tail" (as Carlyle described his train of followers and admirers) were made absolute controllers of everything, and troublesome complications arose seven years later, while Dickens quarrelled with some of these people because they did not take the precise course which he desired during the various tracasseries which followed his separation from his wife. — *London Truth*.

THE DAVENPORT, IA., FILTER-PLANT. — What is described as the best filter-plant in the world is that which has been put in operation at Davenport, Iowa. The conditions to be met required exceptional service. Mississippi water is used, and that in its natural condition is about one-fourth mud, with an unknown but large proportion of microbes. With the filtering-plant 7,500,000 gallons of this muddy fluid is daily made as clear and as sparkling as spring-water. At the point of the river from which the water is drawn, the Mississippi has a current of about five miles an hour, and dashes over the Rock Island rapids, giving it complete aeration, oxidation, and dilution, all of which tend to its purification. The sand used in the filters is brought from Horn Island in the Gulf of Mexico. The peculiar nature of this sand is that each grain is of almost equal texture and a perfect crystal. This is a very costly departure. The ordinary sand that is used for filtering purposes is porous, and therefore does not in all respects answer the requirements, as it permits lodgements in its pores for the microbes. The sediment and all the microbes that the unfiltered water yields necessarily remain on top of the sand in the filters. It is in the economical and certain removal of this impure matter that the chief excellence of this great plant lies. The process of cleansing the sand is not unlike that operative in hydraulic mining. Thousands of fine, powerful jets of water are applied directly to the place where the impurities are located. At the same time the sand is washed by forcing the water upward through the bed of sand, instead of allowing the water to penetrate from the top to the bottom. Each separate particle of the filter's contents is turned around and ground until it has practically been scoured. Then, when all the impure matter has been collected and floats in the water at the top of the sand used for filtration purposes, it is forced back into the river again through a drain that is constructed especially for that purpose. The success of the Davenport plant is regarded as a solution of the water-supply question for nearly all Western cities. — *N. Y. Evening Post*.

DAMMING A RIVER en Bloc. — The story of a remarkable engineering feat in California is told by the *Chicago Railway Review*: A great section of mountain was recently torn off by 10,000 pounds of powder, lifted several feet straight up and then pushed bodily forward forty or fifty feet, trembling over the gorge below the dam, and then falling with an awful roar 125 feet, to remain hereafter for all time as the bulwark of the great dam being built to impound water for the City of San Francisco. The dam is forty-three miles east of the city. For two months or more preparations had been made for the monster blast, in common with another blast that is nearly ready. The plan was to cut tunnels into the side of the mountain at various points above the bed of the creek and to place in these tunnels first, great stores of black powder, which ignites slower than giant powder, and, therefore, has more pushing power and less shattering effect. On the surface and in places through the mountain side were placed big deposits of giant powder for the purpose of shattering the mass and lifting it up. According to plans the black powder when it exploded would hurl the mass straight forward, making a bridge of granite across the gorge and blocking the stream. The plans were carried out with the greatest care, and with a successful result. When the dust cleared away it was found that the blast had dislodged a mass of rock four hundred feet up and down stream and an average of sixty feet in height, completely bridging the canyon. The engineers estimated that the amount dislodged weighed about 150,000 tons. The rock was thrown exactly as the engineers had planned.

MONUMENT TO LORD LEIGHTON. — The design for the monument to be erected to the late Lord Leighton in St. Paul's Cathedral — where the late President of the Royal Academy is buried — has been submitted to the Prince of Wales and approved by His Royal Highness. The memorial is to be in the form of an altar-tomb, supported by emblematic figures, and will be executed by Thomas Brock, R. A. The committee, of which the Prince of Wales is chairman, announces that the monument will cost £2,500, of which all but £100 has been subscribed. — *Exchange*.

LONDON'S NEW ROMAN CATHOLIC CATHEDRAL. — Father Kenelm Vaughan (eldest brother of the Cardinal), who was sent to Spain to promote the work of the new Westminster Cathedral, has had remarkable success in that country. Besides securing the generous support of the royal family and the court circle, he has enlisted the influence of some of the most famous and eloquent of Spanish preachers in the advocacy of his mission. A large part of the cost of a special chapel in the cathedral has been subscribed in the province of Vizcaya alone, where fifteen "founders" have each contributed £60 towards its construction. Spain takes considerable pride in the circumstance that Cardinal Wiseman (the first Cardinal-Archbishop of Westminster after the establishment of the hierarchy in England) was one of her most illustrious sons. — *Westminster Gazette*.

THE BLACKWALL TUNNEL. — The Blackwall tunnel under the Thames at London was opened to traffic on the 22d of May, and the following statistics in connection with the construction will be found of great interest: The total length of the tunnel and approaches is 6,200 feet, and it is lighted by 700 lamps of 32 candle-power. No gas is admitted to any portion of the tunnel. The number of men employed was 800. There were used 17,000 tons of cast-iron, 7,000,000 bricks, 1,000,000 white glazed tiles, 20,000 tons of cement, 110,000 tons of concrete, 5 acres of asphalt and 12 miles of electric-light cables. The total time occupied in the construction of the tunnel has been a little over five years. The portion under the Thames was constructed in almost exactly twelve months, which is at an average rate of 100 feet per month. The contract for the construction of the tunnel was taken at \$4,215,000, but the actual cost of the whole has been nearly \$7,500,000. — *Boston Herald*.

THE ACTION OF WROUGHT-IRON UNDER FIRE. — The resistance to fire offered by wrought-iron pillars recently engaged the attention of a commission appointed by the Hamburg Senate. The report just issued states that such columns withstand fire very imperfectly, their stability being quite destroyed at a temperature of about 600° C., and the advantage of filling them with concrete is very slight. The case is, however, far different with outer coatings of refractory or non-conducting materials which have proved capable of protecting the metal from a dangerously high temperature during a certain space of time, and, consequently, of affording effective protection against fire. The substances which appear to have exerted the best effect are the cork composition of Herren T. Ganzweg und Hartmann, and xylotile incased in sheet-iron, which substances give out inflammable gases for two hours and a-half, leaving a carbonaceous residue that is not destroyed by the steam from the fire-hose. A pillar thus coated, only gives way after being exposed to the fire for four hours, while seventeen minutes suffice to destroy it if uncoated when similarly heated. Next to the above-named substances comes the Monier concrete, laid on in a coat of 1½-inch thickness, which preserves iron for nearly two hours and a-half, while plaster-of-Paris and asbestos cement only gave poor results. — *Invention, October, 1896*.

THE FIRST BELL CAST ON THIS CONTINENT. — In the Nashville Exposition building, which is used jointly for the displays made by Mexico, Chili, and New Mexico, in the space allotted to the latter territory there hangs a bell, battered, cracked, and rusted with age — a bell which certainly, if it could speak in language that we could understand, would tell an interesting tale. It was cast in the year 1549, and is undoubtedly the oldest bell on the American continent, its age being, as will be seen, 348 years. Its birthplace was the town or city of Grande Quivera, N. M., the remains of this city, which was flourishing before Santa Fé had an existence, betokening a population of 20,000 people. The Spanish priest, Father Guerra, superintended the casting of the bell, the metal in it being taken from the Ritade Cobre mines, and to this native metal were added gold and silver coins and jewelry, contributed by the devout people of the city and neighborhood. Here the bell hung and swung and called in the faithful to prayers for 131 years. But in 1680 the dread Apaches, the hereditary enemies of the pueblo or town Indians, destroyed the city and burned down the church. The bell lay covered up in the ruins for 103 years, and was then dug out and taken to Socorro, where it was placed in the belfry of the Church of San Miguel. This church was also destroyed by the Indians in 1806, but the town was soon rebuilt by a colony from Belen; the bell was once more dug from the ruins and rehung in the repaired church, which stands to this day. — *St. Louis Globe-Democrat*.

A ROMANCE OF THE LIBRARY OF CONGRESS. — The work of moving the books of the Library of Congress from the dark and damp vaults in which a majority of them now repose to their new and airy quarters in the building to the north of the Capitol is well under way. Just at present what are technically known as "seconds" are being moved. These "seconds" are simply duplicate copies of works filed under the provision of law for copyright. They have been stored for years in inaccessible and obscure corners — dumped, as it were, at random and never disturbed. For many years a man by the name of Wheeler was in charge of this department of the Library. He was a parsimonious sort of man, with a great dread and distrust of banks and safe deposits. His savings, which were considerable, it is said, were invested in Government bonds, and these bonds he secreted among the books in the vaults confided to his charge. A few years ago he was suddenly stricken with acute paralysis, dying within a few hours after the premonitory symptoms. He was bereft of speech and movement, and on his deathbed made frantic attempts to reveal to his family the hiding-place of his bonds, but without success. His secret died with him. As the bonds were registered, his family has been able since his death to collect the interest, but not the face value of the bonds. The workmen in clearing out the old vaults are said to be keeping a sharp lookout for the treasure, and it is not likely that any of the many thousand books in those vaults will escape scrutiny within the next few weeks. — *N. Y. Tribune*.



Blätter für Architektur.

Neumann & Co., Berlin.

DETAIL OF PORCH: STA. MARIA DEI MIRACOLI, BRESCIA, ITALY.



Blätter für Architektur.

Neumann & Co., Berlin.

STA. MARIA DEI MIRACOLI, BRESCIA, ITALY



MONUMENT TO THE EMPEROR WILLIAM I, ON THE KYF

BRUNO SCHMITZ, ARCH



THE KYFFHAUSER MOUNTAIN, THURINGIA, GERMANY.
H. H. H. ARCHITECT.

HELIOGRAPHIC PRINTING CO., BOSTON.



NEGATIVE BY H. H. SIDMAN, NEW YORK

THE POMPEIIAN COURT: HOTEL JEFFERSON

CARRÈRE & HASTINGS, ARCHT.

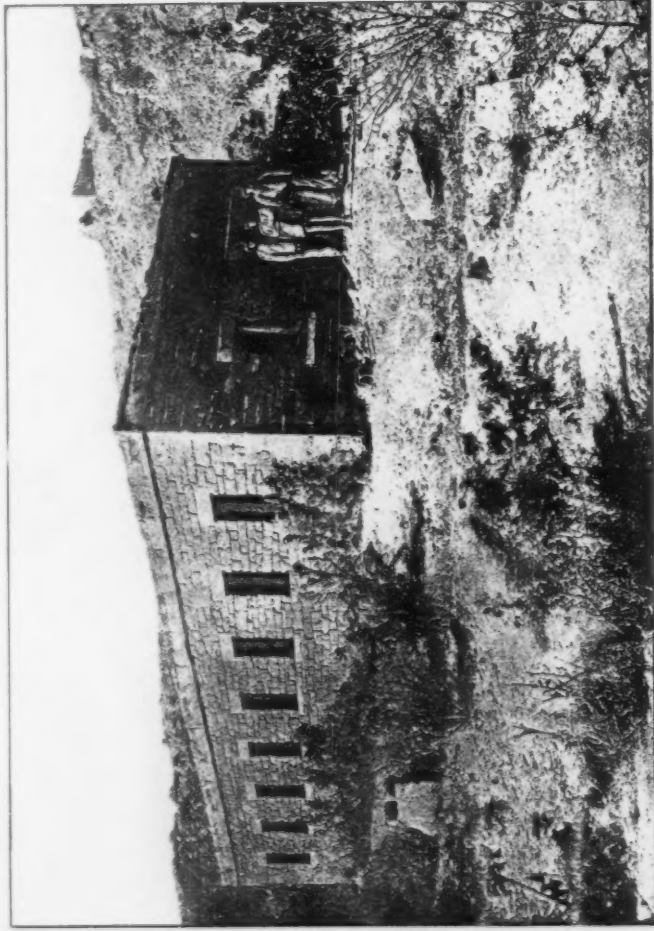


THE HELIOTYPE PRINTING CO., BOSTON

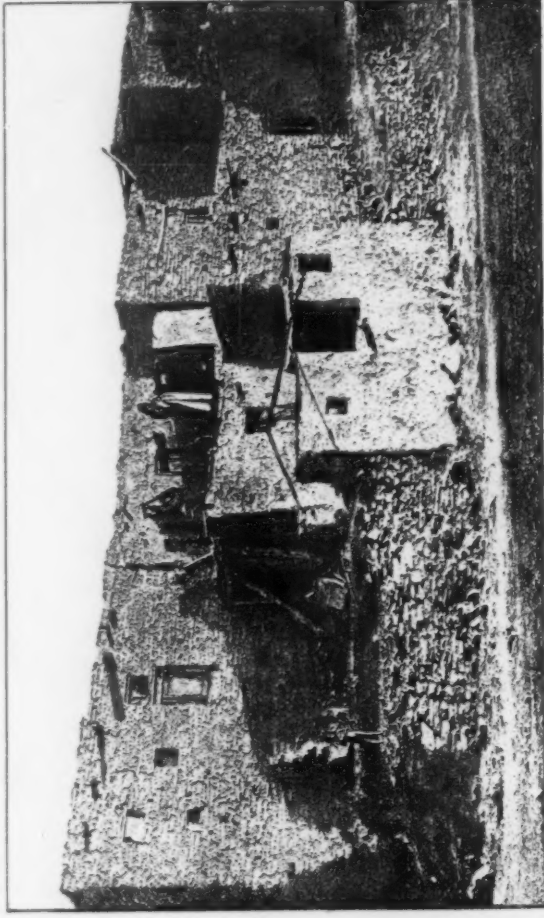
EL JEFFERSON, RICHMOND, VA.

HASTINGS, Architects.

PHOTOGRAPH BY THE AMERICAN ARCHITECT AND BUILDING NEWS.



THE MORMON MILL AT MOEN KOPI, ARIZONA.



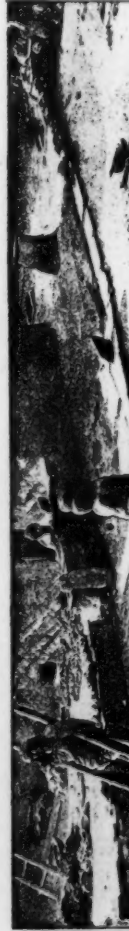
MASONRY TERRACES OF ORAIBI.



BACK OF ORAIBI HOUSE ROW.



FRAGMENTS OF ANCIENT MASONRY IN PESCAO, NEAR ZUNI, N. M.

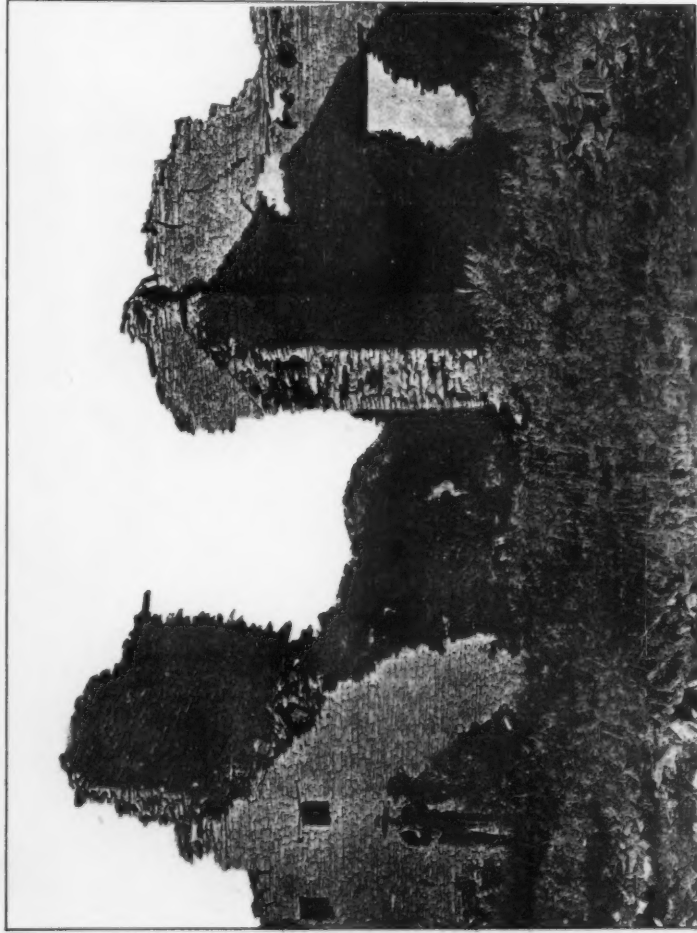




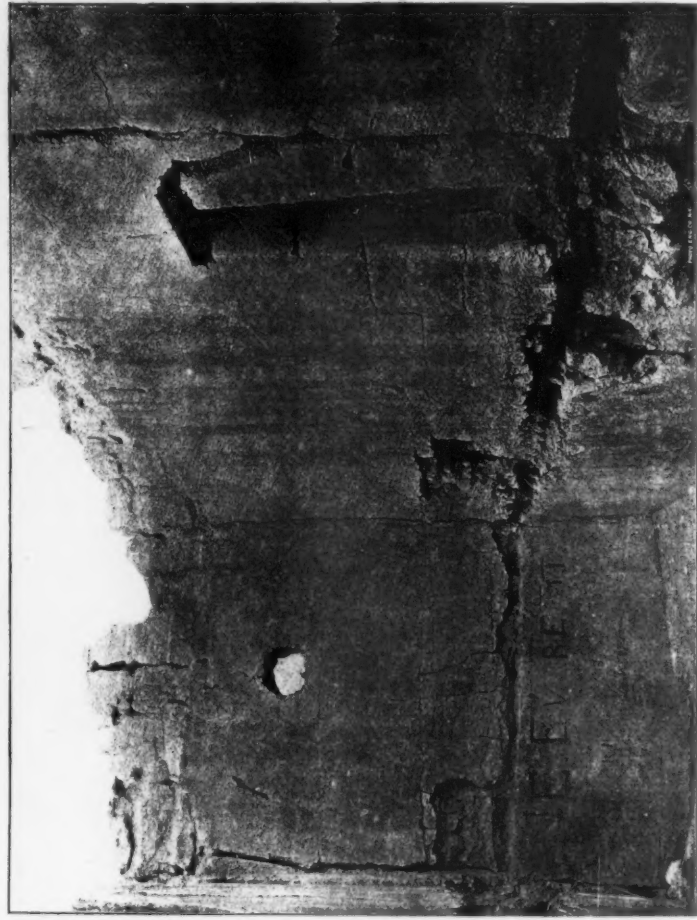
WALL COPING AT ZUNI.



WEST FRONT OF CASA GRANDE RUIN, ARIZONA.



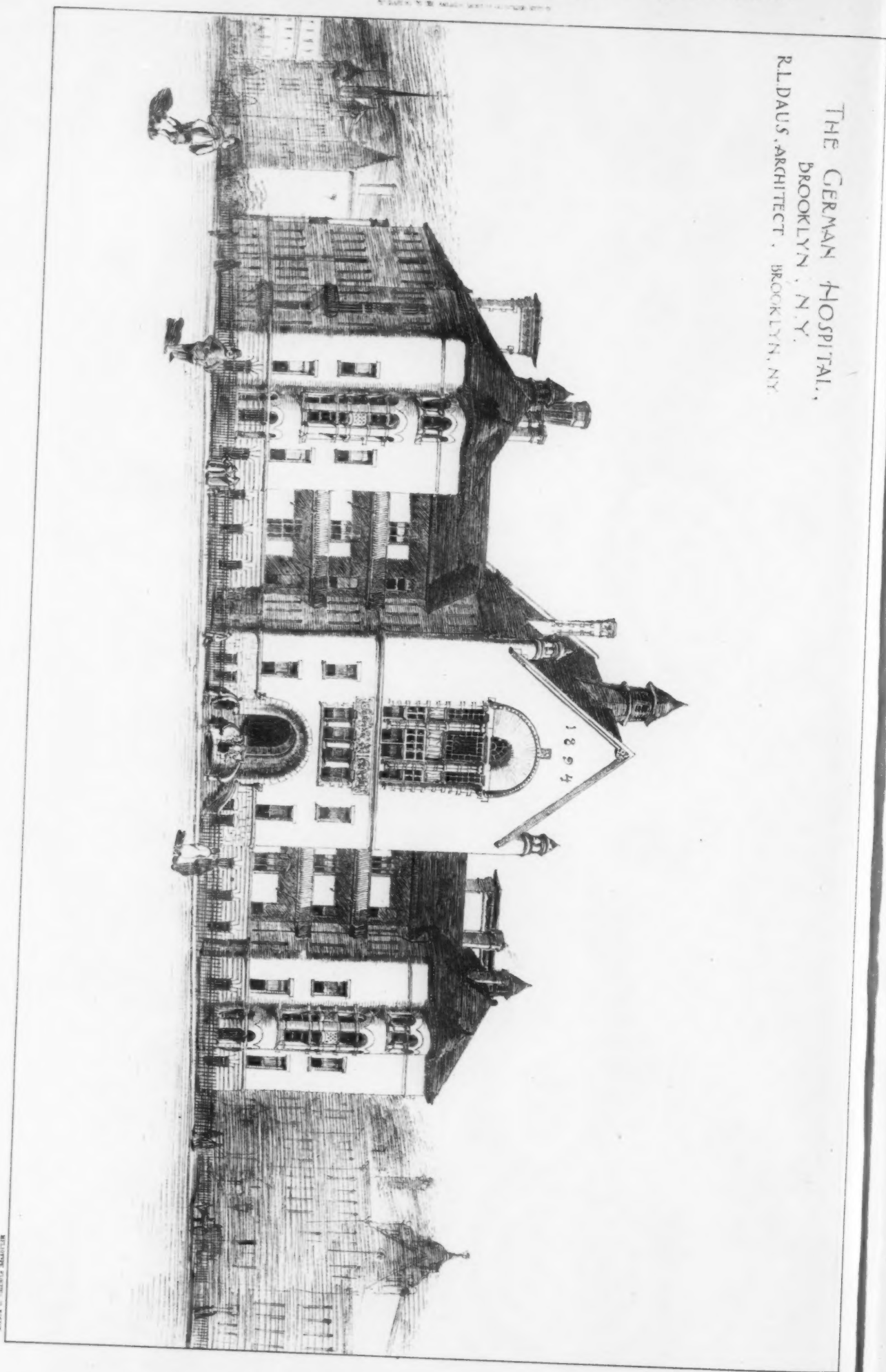
MASONRY IN PUEBLO BONITO, CHACO RUINS, N. M.



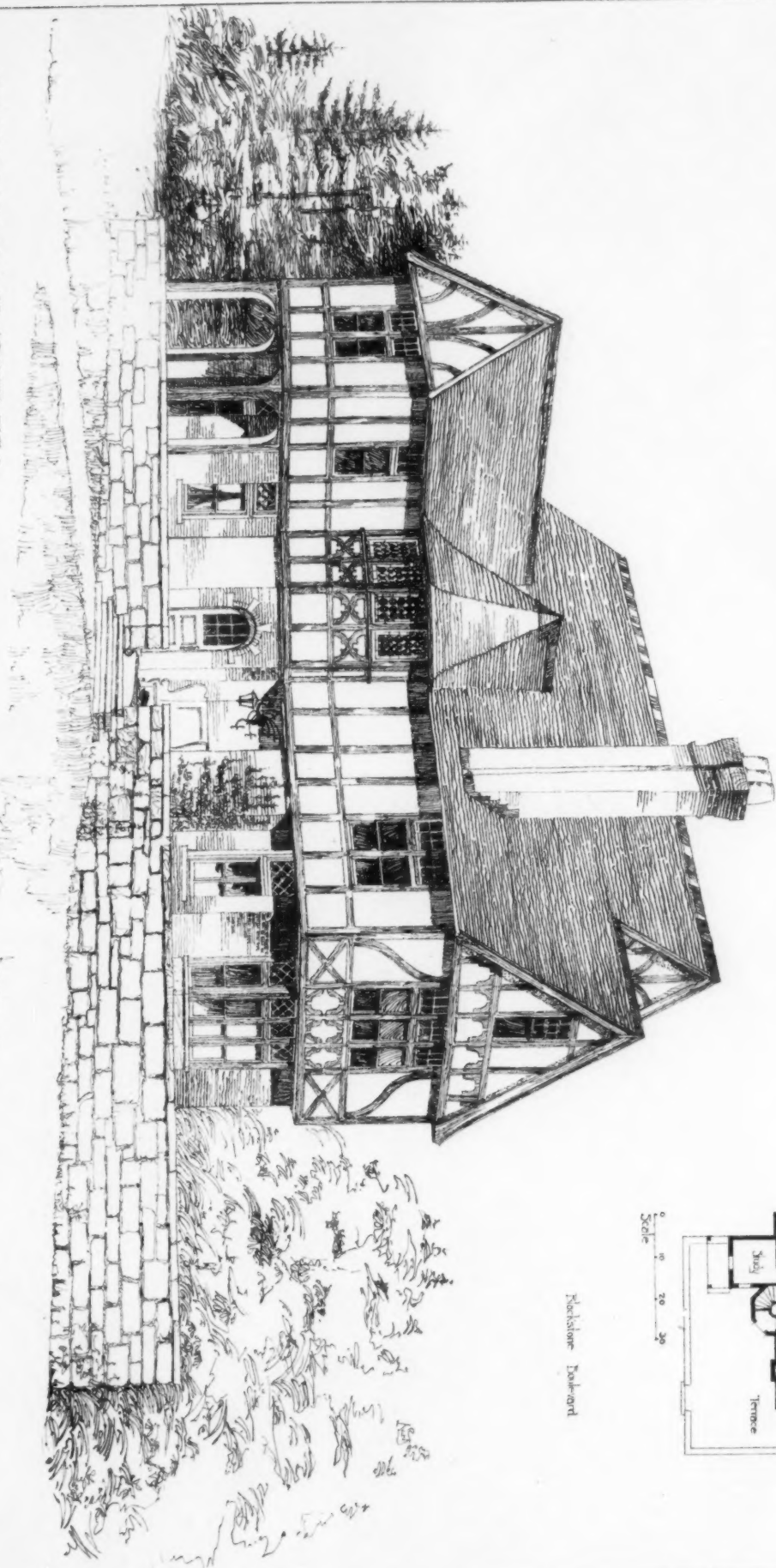
CIRCULAR OPENING IN NORTH ROOM, CASA GRANDE

PUEBLO ARCHITECTURE

THE GERMAN HOSPITAL,
BROOKLYN, N. Y.
R. L. DAUS, ARCHITECT, BROOKLYN, NY



HOUSE FOR P. O. CLARKE, ESQ.
BLACKSTONE BOULEVARD, PROVIDENCE
CLARK AND SPAULDING ARCHTS.
PROVIDENCE, R. I.



Blackstone Boulevard

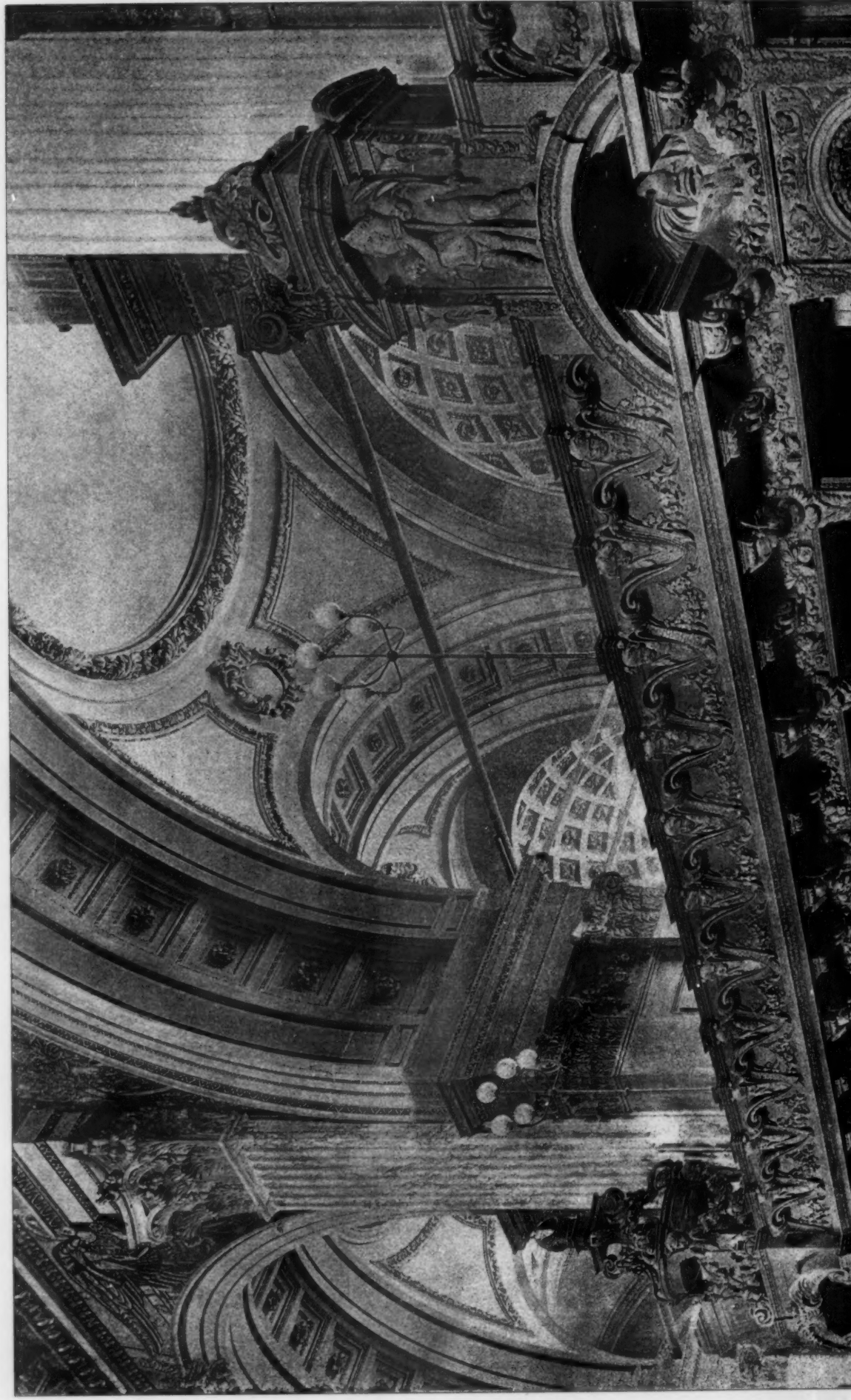


PHOTOGRAPHED BY S. S. BOLAS & CO. H. LUDGATE HILL, E.C.



INK PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

ST. PAUL'S: GATES IN SOUTH CHOIR AISLE.





1887 PHOTO SPRAGUE & CO. 435 EAST WASHINGTON STREET, BOSTON, U.S.A.

PHOTOGRAPHED BY S. B. BOLAS & CO. 11, LUDGATE HILL, E.C.

CATHEDRAL SERIES, No. 47.—ST. PAUL'S: DETAILS OF CHOIR STALLS