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SOME day an interesting volume may perhaps be written on the inner history of New York legislation. Two bills have just been brought forward in the Legislature which suggest such inner history, besides being of importance to the building world in other respects. The first of these, which is introduced by Senator Lexow, provides among other things, that "If a structure or part of a building now standing in the city, known as a bay-window or oriel window, shall extend not more than eighteen inches upon any street, avenue or public place, said structure shall not be removable unless an action or proceeding shall be instituted by or in behalf of the Mayor, Aldermen and Commonalty of the City of New York for its removal, within one year after the passage of the act." The explanation of this proposed legislation appears to be that, although no statute has ever given authority to private owners to project bays or oriels over the street-line, the Board of Aldermen has often, in times past, granted permission to do so, and the bays have been built accordingly. Now, experienced residents of New York are aware that it has, at times, been the ingenious practice of Aldermen to give permits for violations of the law of this sort, and a year or two afterwards, to be seized with compunctions of conscience, and doubts about the legality of their action, which could only be appeased by handsome contributions of money on the part of the owners of structures erected in accordance with such permits. So long as these structures stood, the aldermen were liable to these fits of remorse, which only cash could assuage; and Senator Lexow's bill seems really, though not avowedly, to be intended, not only to relieve the owners of such oriels and bays, after the lapse of a year, from all fear of further proceedings on account of them, but to cut off a source of supply from which the worst elements of the corrupt municipal government drew a very substantial income. Both these are worthy objects, and it is to be hoped that the bill will pass.

THE other bill is, we fear, less praiseworthy in its objects. It provides, in brief, that "Except for repairs, no asphalt, wood or other pavement which shall be wholly or partly composed of foreign productions or materials, shall be laid or used in any street, avenue or other public thoroughfare in any city, county, town or village of this State." To the ordinary observer, this looks simply like the manifestation of a violent attack of Chauvinism upon the author of the bill; but people who know something about the asphalt business will look deeper. These people know that nearly all the asphalt used for paving in this country is composed of "foreign produc-

tions." The best pavements of the sort are laid with rock asphalt from Seyssel or the Val de Travers, in the French Jura; some are made with an inferior rock asphalt from Germany; but by far the larger part are laid by an American company, with an artificial compound, made by mixing sand and gravel with asphalt from the famous Pitch Lake, in the Island of Trinidad, over which, we believe, the American company holds exclusive control, by virtue of a concession from the English Crown. Quite recently, a mineral pitch, similar to that of Trinidad, has been found at Bermudez, in Venezuela, and a company has begun to import and use it in competition with the Trinidad asphalt; but its business is, as yet, very restricted. This, with the addition of a Sicilian rock asphalt, similar to that of Seyssel, but not much known here, completes the list of the foreign asphalts which the so-called Featherson bill seeks to exclude from the State of New York. Of the native asphalts which it proposes to substitute, under compulsion, for the foreign product, very little is known. Kentucky produces, in quantities as yet very limited, a good rock asphalt, similar in appearance to that of Seyssel, although the pitch in it is said to be mixed with silicious sand, instead of the limestone of Seyssel or the Val de Travers. California also produces an asphalt, which has been used rather extensively on the Pacific Coast; and an asphalt from Utah has been employed for pavements in Chicago and Minneapolis. All these native asphalts, although probably good if judiciously used, need, in order to fit them for paving material, a long series of experiments, like those which have made the Seyssel asphalt, as laid in Paris, the best pavement in the world, and have brought the artificial asphalts, made from Trinidad pitch, from a very poor paving material to a very good one. The bill, therefore, simply directs that, henceforth, new, doubtful and almost untried materials shall be used in place of those which many years of skilful experiment have brought to their present excellence, in paving the streets of all the cities of New York. It is not strange that the paving-contractors see in it simply a manœuvre of the combined interests of the owners of native-asphalt quarries to drive all their competitors out of the field by a single stroke; but it will be strange if the people of New York, to whom good and cheap pavements are of vital importance, permit the manœuvre to succeed.

A BILL has also been reported favorably to the New York Legislature from the Committee on Cities, providing that, in the cities of New York, Brooklyn, Buffalo, Rochester and Syracuse, no person shall practise as a mason or builder, unless he is duly registered in the office of the County Clerk; and, in order to obtain such registration, he must be a citizen of New York State; must have served four years at his trade; must have passed an examination before a Board of Examiners, and must pay a fee of ten dollars. Violation of this statute is, by the bill, to be punishable by a fine of not less than fifty, nor more than two hundred and fifty dollars, or by imprisonment for a term of not less than ninety days, or more than two years, or both, at the discretion of the Court.

IF this extraordinary bill should become a law, all the masons and builders who live in New Jersey and practise in New York, of whom there are very many; all the builders from other States, who are called on special occasions to do work in New York or Brooklyn, of whom there is a considerable number; all the foreign-born builders who have not been naturalized, including some of the most expert masons in New York; and all the contracting builders who have not served time at the trade, including some of the wealthiest and ablest contractors in the city, will be excluded from all practice in New York. To take a few examples, the great firm of Norcross Brothers, the builders of the Union League Club, the United Bank building, and several others, will be shut out from New York, as neither member of the firm is a citizen of the State; the house of Herter Brothers, the builders of the Vanderbilt palaces, will be excluded from such work, the principals of the firm not having passed four years in laying bricks; and the whole tribe of German masons, who do excellent work for their compatriots in what is not only the largest of American cities, but the third largest German city in the world, will be compelled to suspend business until they have been through the probation required of applicants for citizenship. It is the

last class on whom the proposed law would fall most heavily, and it is to be hoped that they are alive to the danger which threatens them.

IT seems likely that the part in municipal affairs that in Philadelphia and New York has been played by occasional committees of fifty, seventy or a hundred is to be undertaken in Boston by a joint committee, which has been brought into being at the suggestion of the Standing Committee on Insurance and Building Law of the Associated Board of Trade. This first joint committee, which may be supplemented by others of like nature, has been now made up of delegates from the Associated Board of Trade, the Master Builders' Association, the Real Estate Exchange and the Boston Society of Architects, five members from each body. Its permanent function is to watch over legislative action affecting its particular field, so that it may oppose undesirable special legislation, and may support and promote legislation of general public value, and so gradually achieve the position of accepted expert adviser to inexperienced legislative committees. The usefulness of such a body in the way of defeating the many private bills which seek to gain a selfish advantage to their promoters at the cost of public good is incontestable. Such selfish measures are constantly presented for action, but it has been no one's duty to follow up the legislative docket, and the defeat of undesirable measures, when it has been accomplished at all, has been the result of individual action aroused by the attention of some one public-spirited citizen being accidentally attracted to the matter.

AS such a committee, for effective work, must have a fair starting-point and a good base for future operation, this joint committee has brought forward a very important bill which seeks to bring order out of the present chaotic condition into which matters were thrown by the new city charter, the abolishment of the office of City Architect and the consequent distribution of work and duties this change involved. The bill seeks to create a new Building Department, which, amongst other things, unites under one head the duties of the present Department of Public Buildings and the Department of the Inspection of Buildings, the new head of the department, to be appointed by the mayor, to receive a salary large enough to command the service of the best trained and most expert architect, builder or engineer. All assistants, whether heads of special bureaus, inspectors or clerks, are to be appointed by the proposed Building Commissioner only after the applicants, whether present officials or new applicants, shall have passed an examination before a Board of Examiners consisting of three members, one member each, appointed, with the approval of the mayor, by the Boston Society of Architects, the Master Builders' Association and the Boston Society of Civil Engineers. It is needless to say that a body of officials secured in this way should, so far as expert knowledge goes, be highly efficient, probably more efficient than the body which at present administers the building-laws, but the matter of tact, judiciousness and administrative ability cannot be determined by examination, and these important qualifications must be determined by the test of experience. The proposed bill is particular in providing that any of the examiners may be removed by the mayor for "malfeasance, incapacity, or neglect of duty," but does not provide how any other official is to be got rid of. Presumably the ordinary Civil Service rules are to apply, and dismissals can only follow charges properly laid and clearly proved. The Building Commissioner is to be an appointee of the mayor, and as the Commissioner is to appoint, with the mayor's approval, his three chief assistants, the Inspector of Construction, the Inspector of Condition and Use, and the Inspector of Sanitation of Buildings, it seems that these four important chief officials are liable to lose office as a consequence of each annual civic election. It seems to us that this is a weak point in the measure. Still, with the Joint Committee of the Board of Trade looking after the initiation of legislation, the Building Commissioner with his enlarged powers, the Board of Examiners to assure good men in the ranks of inspectors, etc., and beyond all the present Board of Appeal, which is to be continued in existence, it really seems as if building matters in Boston might after July next begin to find themselves in a more satisfactory condition than ever before.

A CORRESPONDENT calls our attention to a case which was heard in the French Courts recently, and which has a certain interest to architects. One M. Wille, a builder, constructed a chapel in the cemetery of Roubaix, and had his

name cut upon it, as a sort of artistic signature. It happens that a local ordinance of the City of Roubaix forbids contractors to insert their names upon funeral monuments otherwise than by initials; while another clause in the same ordinance provides that no inscription shall be placed on any monument until it has been submitted to the Mayor, and approved by him. This curious regulation seems to have been originally intended to check the use of gravestones for advertising purposes, which, in a large manufacturing town like Roubaix, may have been unpleasantly common. However that may be, it was invoked against M. Wille, and he was brought before the police court, and sentenced to pay a fine of one franc, and to have the inscription erased. An appeal was taken from this judgment, and the appellate tribunal reversed it, saying that the ordinance must refer only to epitaphs and mortuary inscriptions, and not to the signature of the author on a work of art; that the police rights administered by the Mayor could have for their object only the maintenance of good order, decency and the public health, and that the Mayor exceeded his powers in forbidding an inscription which could not offend morality, decency or good order. Moreover, it declared the ordinance itself illegal, in so far as it forbade contractors to put anything but their initials on their works, for the reason that such a regulation infringed the rights of artistic or industrial propriety, which could not be encroached upon by a municipal ordinance.

FOR us, this little story serves only to show how sacred the rights of artists are held to be in France. Here, it is hardly necessary to say, such rights are almost unknown. Some years ago, there was a lively discussion in New York over the practice of allowing an architect to mark his work by some sort of signature. The late Jacob Wrey Mould, an artist of great merit, and a manful defender of artistic rights, usually put his monogram somewhere on his buildings, either in the form of an iron finial, or as an interlaced ornament in a panel, much to the disgust of some of his clients, who could not conceive how the person who merely designed a structure could have the audacity to call to mind his relation to it without the consent of the magnate who paid for it. Mr. Mould's view was supported by many of the architects of the city, and some of them had the courage to follow his example, where they were not too much afraid of their clients; but the practice seems to have been abandoned after the death of its most earnest defender, until, now, it is not easy for the architect, even of a public building, to get permission to have his name attached to it. This modern American habit of ignoring the architect of a building is fostered by the newspapers, who finding that architects like to have their names mentioned in connection with their works, are ingenious enough to try to make profit out of this natural desire. We remember a case where an architect was approached by a reporter from a great daily newspaper, who asked for information in regard to a certain public building of some interest, which he wished to "write up" for his paper. After obtaining such particulars as he desired, he inquired of the architect, "How much will you pay to have your name mentioned, as the architect of the building?" The architect declined to pay anything for this valuable privilege, whereupon the reporter, quite unabashed, replied, "Oh, well, the *Hustler* never mentions the architect without being paid." There is much reason to suppose that the *Hustler* is not alone among newspapers in its thrifty view of the subject, and it is not surprising that the recognition of artistic property, which can only be had in public prints by paying blackmail, is not accorded with much ardor by private clients. That art suffers from this ignoring of the artist there can be no doubt. A painter works hard to make his picture creditable to the name with which he is expected to sign it; and, if architects were in the habit of signing their work, their clients would get the benefit of a great deal of artistic study, which the architect knows will be lost on the unappreciative owner, but which he would gladly devote to preparing his work for the eyes of better-instructed critics, if he knew that they had the means of connecting it with him. For this reason, if for no other, the practice of allowing architects to sign their works, if not admitted as a matter of right, ought to be encouraged by all possible means, both by the public and the profession; and we venture to say that the community in which, in this country, it shall first become general will very soon take the lead in architectural development.

THE MAN ON HORSEBACK!

NOW that the Sherman Statue Competition is about concluded and the important question of its location settled, by a solution equally surprising and satisfactory, it would seem a suitable time for the opening of the whole question *de novo* as to the kind of statues or other public monuments to which the noble spaces and conspicuous sites of the nation's capital should be devoted. It is certainly reasonable to expect that at this stage of our country's growth the monuments erected at public expense and in our public thoroughfares should in some way be an expression of the distinctive national ideals of this republic. Deserving as are the distinguished generals of our army of our monuments and unfading esteem, there is still to be had in view the danger of overdoing, even in the effort to honor them. The effect of the over-multiplication of monuments of any single type can only be to reduce their impressiveness and their value as a tribute. But beside this question of honor to them, there remains the strange incongruity—that must strike the foreign visitant to Washington, who expects to find here, if anywhere, some distinct exhibition of our nation's sentiment and aim; for here, at the capital of a republic that boasts of its diminutive army and its own devotion to the arts of peace, and whose President, at a recent Congress of American Republics held at the capital, remarked to the foreign visitors that "he had held a review of troops in the White Lot only to show them that we have not an army"—that here the only profession that the people care to honor with their monuments is that of war, and that the only achievements worth mentioning or remembering in our national history are those of the battle-fields, either of the Revolution or of the Rebellion.

Are there no victories of peace won by our people during the first century of our nation's life that deserve commemorating at the capital? Is war so predominant a topic in our national life and ambition that the "man on horseback" shall confront our vision at every conspicuous street-corner? I am convinced that no one of our great patriotic generals would say that this was the kind of patriotism for which he gave his life. They did not fight for military glory, nor was it their aspiration to see our nation a great military power among those nations whose main business is war or the prevention of war. And yet, if we were a nation devoted to war and its glories alone, could we do more in the way of monumental honor to this ideal of greatness than we have done already, judging by the predominance here at the capital of military over all other types of patriotic service commemorated in our public statues? In any world's Congress of Nations, were the United States of America represented only by a company of generals of the army in uniform, I believe no one would be more conscious of the incongruity of such a representation than those gentlemen themselves; and yet, here, in the capital city where our republic is, so to speak, on constant dress-parade before the world's eye, we have in our streets and parks two war monuments to every one devoted to service in civil life! A truly fine statue of Lincoln is placed at the far-away end of East Capitol Street and carefully hidden from view by a clump of cedars placed directly between it and the long vista from the street.

Good Ben Franklin, the printer and philosopher, valiantly holds his own on the avenue, despite the approach of the armed riders from all quarters; and in the quiet glades of the Smithsonian some great heroes in the arts of peace are finding their congenial haunts, while Story's beautiful statue of the first Chief Justice at the foot of the Capitol Terrace speaks an eloquent word for the elevated function of the judiciary in our civil system. But in the thoroughfares of our nation's capital, where the stranger-visitant passes up and down every day, the equestrian military statue is already becoming so frequent as to threaten to leave no place for monuments of a different purpose in the future, however much they may be desired, while the monotonous repetition of a single type of monumental art makes this tame and wearisome. Is it strange that one familiar with the beautiful art embellishment of foreign capitals should ask: Where is your National Gallery of Arts? Where are your great national pictures? Where are your walls decorated with the frescos of heroic and romantic scenes of your nation's history and legend? Why are the magnificent terraces and porticos and pediments of your public buildings left vacant of statuary, as if swept bare by a raid of vandals? Where are the groups of your great American scholars, poets, inventors, discoverers, philanthropists and statesmen that should, even by this time, be adorning the fine spaces along the avenue from the Capitol to the Treasury? Where are historical or symbolic monuments of your nation's achievements in transportation and communication that should adorn your General Post-office? Where is Edison group that should stand on the portico of the Patent Office? Where the historians and poets and philosophers to grace the noble approaches to the new Library of Congress? Why are not the great esplanades about the Capitol adorned with symbolic groups representing the marked achievements of the several States of the Union in the advancement of civilization on this continent and the great porticos and sunken gardens of the Treasury and the State, War and Navy Departments relieved of their cold emptiness by statues of eminent civilians or by symbolic representatives and reminders of the development of our trade and commerce?—Is there for all this wide use of commemorative and decorative art no field, no call whatever in the capital of the United States? And are there for all the conspicuous spaces for monuments to be appropriated one after the other for the generals in the late war? and this, too, in

view of the fact that commemorative monuments are in a manner sacred and cannot be removed at will, like other ornamental structures? Finally, how long will it be before our Government will see that justice to the people demands that this matter of the selection and location of public monuments and the adornment of buildings and grounds belonging to the Government be put in charge of a competent and permanent Commission of Fine Arts. FRANK SEWALL.

SPANISH ART AT THE NEW GALLERY.—II.

FOR the last two hundred years tourists have crowded to see the galleries of Italy and Venice, and have neglected the treasures of the Museo del Prado, where alone the chief works of Velasquez are to be seen at their best. But of late years he has been as one may say "discovered," and owing to the more settled state of Spain and the greater facilities for travelling to that country, it is probable that he will be better known and appreciated in the future, though posterity will marvel greatly, as we do, how it was that this consummate master kept the fire of his genius alive and burning with an ever-increasing brilliancy until he died.

While this exhibition has made us acquainted for the first time with the works of some fine painters hitherto unknown, Velasquez and Murillo are, as they ought to be, its backbone. "The Golden Age of Spanish Art" was that which these masters created and with their lives it ended. The skill born with Velasquez died with him; and though there were followers of Murillo who could imitate his coloring, his composition was beyond their reach.

Diego Rodriguez de Silva y Velasquez was born at Seville in 1599—the same year in which Vandyke was born at Antwerp.

His father, de Silva, claimed descent from a Portuguese house of royal lineage, while his mother, from whom—in accordance with Andalusian usage—he took his surname of Velasquez, was of a noble Sevillian family. He was carefully educated and early manifested a great love and talent for drawing. Unlike the parents of many distinguished Italian painters who endeavored, but in vain, to beat or nip the budding talents of their sons, those of Velasquez recognized and encouraged his. It must, however, be borne in mind that art in Spain was at the zenith of its glory, and that many of the nobility, while following the fashion set at Court of treating painters with the highest consideration, were themselves celebrated artists. "The Duke of Beja—who hesitated about accepting the dedication of 'Don Quixote'—added the reputation of a good painter to that of a gallant soldier." Indeed, the artistic splendor beheld on all sides by Charles I, when as Prince of Wales he paid his romantic visit to Spain, induced the determination to form a royal collection which he so ably fulfilled after his succession.

The pursuit being thus in no way derogatory to his position as a lawyer, the father of the youthful Velasquez placed him under the tuition of Herrera, but, with all the other pupils, he was soon driven away by the violent temper and severe discipline of this "clever brute," as a writer calls him, not however before acquiring from his master that boldness of handling which results from drawing and painting at the same time. His next master was Pacheco, Inspector of Paintings to the Holy Office, "feeble creature of rules, cold in color and commonplace in conception," a mere theorist in fact. A writer on Spain gives the following translation of an epigram on a painting of Our Lord by Pacheco:

"What have we painted here, Señor,
So pallid, hard and secco?
You say it is Divine amor,
But I say it's Pacheco!"

Disappointed thus in both his teachers, Velasquez formed the resolution, from which he never swerved during the whole of his brilliant career, to adopt nature as his guide, and to this end he kept by him a peasant lad, whose portrait he painted in all kinds of dresses, or tatters, or none, and under the influence of every emotion; and in this manner he laid the foundation of that uncompromising realism and admirable truth and feeling that always distinguished him and made him the "King of Portrait Painters." To improve himself in coloring, Velasquez next devoted himself to those studies of still life and low life, known as *bodegones* or kitchen-pieces, so illustrative of his early and somewhat hard, Sevillian manner. We have in the present exhibition an almost unique opportunity of inspecting a few of these works; two of which, "The Water-Carrier of Seville" and "Two Peasants" hang side by side for the first time since they were painted in 1622, more than two and a half centuries ago: a proof of the date and genuineness of these *bodegones* is given by the fact that the same boy appears in each picture.

The former picture, lent by the Duke of Wellington, is famous as having been taken by King Joseph Bonaparte from Madrid. After the rout at Vittoria, his carriage fell into the hands of Wellington with all the jewels, pictures and other rich booty with which it was filled. "The Water-Carrier" and a small gem of a Correggio were returned by the Duke to Ferdinand VII of Spain, who generously presented them to the victor and they have ever since hung on the walls of Apsley House. This "Aguador," 40" x 30", is a composition of three figures: a sunburnt, wayworn seller of water, wearing a brown jerkin, through the tattered sleeve of which we see a

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remarkably clean shirt; his huge earthen jars, and two lads, to one of whom he has just handed a large wide-brimmed glass of water, the other boy meanwhile drinking from a mug. Every detail is perfect and realistic to a degree, while the dignity of the water merchant is worthy of a grandee. "The Old Woman and Omelette," as the "Peasants" is also called, is a kitchen scene and represents a woman sitting in front of an earthen pan into which she is breaking some eggs, a boy at her side with a melon under his arm offers her a wine-flask; kitchen utensils are on the table and floor, and a basket with vegetables hangs on the wall. Though cold and subdued, the colors, as in all these kitchen-pieces, blend harmoniously; the canvas is 39" x 46", and is lent by Sir F. Cook. This owner also lends a "Spanish Beggar," a jolly comical-faced toper leaning on a crutch and resting the Moorish looking stone wine-flask he holds, on a globe that occupies one quarter of the canvas. This globe, while appearing transparent, really contains a beautiful landscape in which the spectator sees a group of persons drinking and dancing in front of a *bodega*. It is a little conceit of the painter to delineate what is evidently called up in the half-drunken man's imagination.

It is probable that at this stage of his career, and after a five years' residence in her father's household, Velasquez married Juana, the daughter of Pacheco, of which match Pacheco wrote, "I gave my daughter in marriage, moved by his virtue, purity and good parts, as well as by the hope derived from his great natural genius. The honor of being his master is greater than that of being his father-in-law. I hold it no disgrace that the pupil should surpass the master."

When Velasquez was twenty-three years of age, there arrived at Seville a number of examples of other schools of painting in Spain and elsewhere, the sight of which so roused and gratified his artistic soul, that he determined to visit Madrid in order to see the royal collection. The master whose works made the only lasting impression on him was Luis Tristan, of Toledo, whose style was a combination of Titian and El Greco.

After a brief stay at the capital, where he was warmly received by some fellow-townsmen, among whom was Don Juan Fonseca, a courtier, Velasquez returned home, but through Fonseca's interest with the Count Duke Olivarez, Prime Minister and real ruler of Spain and her sovereign, was shortly recalled by desire of the great man. Velasquez then painted a portrait of Don Fonseca, which being shown immediately on its completion to Philip IV and the assembled court, procured for him the honor of being appointed Painter in Ordinary to the King, at a large salary, to which was afterwards added money for the expense of bringing his family to Madrid.

Now began the long series of royal portraits so numerous as to be confusing, with which all visitors to "Christie's" and other art sale-rooms are familiar. With his pale Flemish complexion, heavy underlip and sleepy gray eyes, and his long curled moustache, Philip was portrayed under nearly every circumstance of life—even kneeling on embroidered cushions at his devotions, which were punctiliously observed. He spent part of every day in the studio which he had given to Velasquez in the Royal Palace and of which he possessed a key, gave sittings of three hours' duration and occupied his time with this new hobby, and others far more unworthy. In the meanwhile, the interests of the kingdom were left to the power-loving Olivarez, who engaged Spain in long fruitless wars with France, ending in a diminished army and the loss of Portugal.

We do not wonder that Velasquez looks somewhat depressed in his own portrait, when we read that Philip "considered it one of the most sacred duties of a king to maintain a grave and majestic demeanor, was known to have smiled but three times, and reined-in his steed with the solemnity that would have become him in pronouncing or receiving sentence of death."

A splendid full-size equestrian portrait, unfortunately lost in a great fire, was the painter's first essay. It was exhibited on the festival in an open space to the admiring public, when Olivarez said, "No one had ever painted the King before," while Philip promised Velasquez that in future he alone should paint his portrait; indeed, he talked of having all those that existed collected and destroyed. This, the first of three equestrian portraits of Philip by Velasquez, was celebrated in verse by all the poets of the day. The Earl of Northbrook lends a small canvas, 23" x 17", formerly in the Rogers collection, said to be the finished sketch of the great picture, under which it used to hang in the Palace of Buen-Retiro (built by Olivarez for himself, but presented by him to his sovereign).

Of the two portraits of Philip by Velasquez in the exhibition, one, lent by E. Huth, is a large canvas, 82" x 49", from the Louis Philippe collection. In this handsome and commanding picture the figure stands life-size and is dressed completely in black; in one hand he holds a paper commencing "Señor," the only bright color introduced being a red tablecover and background. It is identical with and believed to be the original of that in the Museo del Prado, which was probably the work of Juan de Pareja, Velasquez's slave. We have also an earlier portrait from Dulwich College, injured by cleaning and badly hung. Philip, at this time about twenty-two years of age and looking less bored than we usually see him, is superbly attired in a doublet of delicate rose-color with silver embroidery, white silk gloves and a falling collar; in the right hand he holds a baton, and in the left his black hat. In this masterpiece of harmonious coloring, there is great delicacy of technique combined with boldness of outline. Velasquez painted only one other similar to

this in its soft colors—that of the "Infanta Maria Theresa" at the Prado. There are two fine portraits of the first wife of Philip, who was the beautiful Isabel (or Elizabeth of Bourbon), daughter of Henry IV of France, and sister of Henrietta Maria, wife of Charles I of England. The ambassador who conducted this princess to Spain escorted the "Infanta," known as Anne of Austria, to France, to be the wife of Louis XIII, the exchange being made on the same day. Of Isabel's seven children only two survived infancy, namely, her youngest daughter, Maria Theresa, whose portrait is at "The Old Masters" Exhibition, and Don Baltasar, the only son and heir-apparent, who died aged seventeen. There are four portraits of this prince, the first as a child of two, being amused by his dwarf—with which the Alcazar abounded; a second at the age of seven, looking every inch a prince, is holding a gun and has some fine dogs with him. The third, 39" x 22", depicts him at the age of ten, and is lent by the Queen; it is kept in a room at Buckingham Palace not often seen by visitors. It is said to have been presented by Philip to Charles I and has only recently been brought from a storeroom at Windsor Castle where it had been forgotten. At the sale, in 1651, of pictures belonging to the Commonwealth, "A Prince of Spain" sold for 10s. The last picture of the little prince was painted in 1641, and represents him on a prancing pony, while near him Olivarez (who, among other numerous posts, held that of riding-master to the prince) stands in conversation with two men, one of whom offers him a lance; the King and Queen are looking on from a balcony near. This fine picture, evidently a sketch for a larger one, was painted about two years before the fall of Olivarez.

Portraits of Mariana of Austria are by no means unfamiliar to us all. This Princess, the niece and the second wife of Philip IV, was at a very early age betrothed to Don Baltasar, but as he died in 1646, she was married to his father in 1649, when she was only fourteen. Of her five children one survived and reigned as Charles II.

Returning to Spain with the paintings he had purchased for the King, Velasquez commenced a fine equestrian portrait, of which a model was made in wood and sent to the Florentine Tacca for a bronze statue, which now stands in the Buen Retiro Gardens. A second journey to Rome to purchase more pictures and to make casts of antique figures was undertaken at Philip's own expense. In the interim Innocent X had been elected Pope and to him Velasquez was presented, receiving a command from him to paint his portrait, with which the Pope was so gratified that he gave the artist a gold chain and medal of himself. The Duke of Wellington lends the half-sketch from this, 31" x 27". The Pope, a man of coarse and surly physiognomy, is represented sitting in his arm-chair, on which his white and flabby hands are resting. Every feature of this repellent face tells, whether it be the slight knitting of the brows, the steady look of the shrewd, crafty eye, or the cruel hardness of the mouth, "a mouth that shows a love of life and its good things and of domination." The different reds of the biretta, the cape and the complexion are capitally managed in this truly gorgeous piece of workmanship. Mr. Butler lends a fine copy—probably Italian—of the large completed picture, in which the white lace sleeves and the robe form a fine and startling contrast of color. The original painting, of which Velasquez took many copies back to Spain, was considered by Sir Joshua Reynolds, who saw it in the Doria Palace, to be the finest picture in Rome. Palomino relates that one of the chamberlains, catching a glimpse of the portrait through an open door, advised the courtiers to "speak more quietly, as His Holiness was in the next room"; still more astonishing is the story told of the portrait of Admiral Pareja, now in the National Gallery—which was seen in Velasquez's studio by Philip, who, knowing he ought to be miles away at sea, exclaimed angrily, "Still here! having your orders, why are you not gone?" Getting no response, he saw his mistake and said to the painter, "I assure you I was deceived."

A vivid likeness is exhibited of Velasquez's slave (strangely enough, the same name), Juan de Pareja, who by stealth had become a great painter in the same manner as did Murillo's mulatto, by watching his master and listening to the instructions given to his pupils. One day Philip noticed a picture turned to the wall and asked who had done it, when the slave throwing himself at his feet begged his protection, on which the King turned to Velasquez and said, "A painter like that ought not to remain a slave." Pareja, kissing the royal hand, arose a free man and, becoming a pupil, never left his master. The portrait of this slave was dashed off one morning during the visit to Rome, and the original being the bearer of it to some artist friends in Rome, they were so delighted with it that they procured his immediate election into the Academy of St. Luke.

The Duke of Wellington's undoubtedly genuine "Portrait of Don Quevedo" is unapproached in realism. With his massive head covered with bushy iron-gray hair he looks at us through a pair of large round spectacles—rendered imperative by long study—as if he were concocting one of those satires which at last lost him his liberty. The same owner's "Portrait of a Man," until lately said to be one of Velasquez himself, is a simple likeness of a hidalgo fascinating in its inscrutability.

Unrivalled in portraiture, so that his men look ready to step out of their frames, making us regret that owing to the jealousy of Spanish husbands we have so few examples of female loveliness, Velasquez was also great in landscape and historical and subject paintings. Excellent examples of these are given in his "Surrender of Breda"

and "Los Bebedores," of which first-rate copies are shown, while for more domestic scenes, witness his "Hilanderas" and "Meninas" represented here by good etchings lent by the Spanish ambassador. In this last picture Velasquez has the Cross of St. Jago, the story of which is that Philip on inspecting the painting declared there was only one thing wanting, and taking the brush from Velasquez, painted the Cross on his breast on the canvas. It required, however, a dispensation from the Pope, after a delay of two years, to overcome the scruples of the grandees at receiving the artist into their ranks.

The "Meninas" was the last great work of this consummate master, and one cannot but feel indignant that the last four years of his life should have been frittered away in arranging court ceremonials, placing the King's chair at dinner—doubtful honors!—which fell to his lot in consequence of his being appointed to a post answering to our Lord Chamberlain. On the occasion of the marriage by proxy of the Infanta Maria Theresa to Louis XIV, Velasquez's duty was to journey with the King, have a fine pavilion prepared, and receive the Royal personages at the Pheasant's Isle on the Bidassoa, the scene of so many famous interviews. Fatigue, however, and malaria developed into a fever soon after his return to Madrid, and in spite of every effort Velasquez died August, 1660, his wife Juana surviving him only eight days.

We must now proceed to notice somewhat briefly the works of that artist whose name is so widely known throughout Europe as to be, until very lately, almost the sole representative of the Spanish School of Painting.

Bartolomé Esteban Murillo was born at Seville at the close of the year 1617. At an early age he began to blacken the whitewashed walls of his humble home with his sketches and to scratch figures on the floor. His childhood was passed without education or pleasures, so that one of his biographers calls him a most melancholy youth. Fortunately, the boy had a relative, Juan de Castillo, of some repute as a colorist, who out of compassion took him to his studio, though unable to teach him much more than correct drawing and the art of priming his own canvases, by which much expense was spared, and which served him in good stead when thrown on his own resources. This occurred in 1640, in consequence of Castillo's removal to Cadiz, when Murillo, deprived of both teacher and kind protector, had to earn his own living.

At that time there was, and still is, a market or *feria* held every Thursday in a broad street in Seville in front of the Church of All Saints, which is remarkable for its semi-Moorish belfry. It was the custom for very inferior artists to post themselves in this market with their canvas and colors, and to execute orders on the spot for pictures in religious subjects to adorn the poorer class of houses, or for sale to South American traders for exportation to the numerous churches and convents then being built. Murillo at once betook himself to this *feria*, and being obliged to work very rapidly and on various subjects, he attained a remarkable freedom of touch and readiness of expression.

At this epoch an old pupil of Castillo's, named Moya, returned to Seville from the Low Countries and London, where he had been instructed by Vandyke. Seeing the excellent work done by his friend, Murillo determined to improve himself by travel, but the great, and, indeed, the only obstacle was the utter want of means. However, there was still the *feria*; so cutting a large piece of canvas into various sizes he painted thereon pictures in all styles and disposed of them to the traders for exportation to South America, where, doubtless, even now many might still be found in ruined out-of-the-way convents and churches. With the funds thus obtained, Murillo went at once to Madrid, where Velasquez, then at the height of his fame, received him most kindly, took him to his studio and home, and gave him every possible facility for studying the great masters in the Escorial and elsewhere; besides introducing him to Olivarez, need one say "the great art patron," and ultimately showing some copies of his paintings to Philip. When two years had been thus usefully employed, Murillo determined to go no farther in search of improvement, but to return to Seville; and notwithstanding Velasquez's entreaties, and it was said on account of the disgust he felt at the disgrace of Olivarez, he would take no service under Philip, nor receive his bounty. Arriving at Seville, poor and unknown as he left it, he got a commission to paint three pictures for the Convent of St. Francis, simply because no known painter would do them cheaply enough. On their completion, however, the painter rose to fame at a bound. Crowds flocked to see them and orders flowed in from all parts of Spain. These cloisters were burned in 1810, but, fortunately in this case, Marshal Soult had the pictures safe in his gallery.

From this time (1645) until his death in 1682, Murillo never left his home in Seville. In 1648 his position was so good that he was able to marry a lady of property living at Pilas, whom report says he won by introducing her as an angel in an altar-piece, being afraid to declare his passion otherwise. No portrait exists of this lady, Donna Beatriz, but both she and her daughter were in later life models for his virgins and saints—of which we may say in passing that they were not mere inanities, but that in them all we see the expression of a human heart with human passions like our own. After his marriage Murillo changed his manner, which is called "the cold," to "the warm," adopting a softer outline and a more mellow coloring, such as characterize some of his best works. It has been observed of his latest works in his "*vaporoso*," or soft manner, that they seemed to be painted "with blood and milk."

With few exceptions, we shall do no more than name the numerous pictures of religious subjects in which the devout Murillo excelled. We cannot forbear to speak of the "Virgin and Child," lent by Lord Wantage, a large canvas 64" x 43". The Virgin for this enchanting picture was evidently a high-born woman—and we know that Philip III's Queen considered it an honor to be introduced as such into a picture. She has an exalted and happy expression and sits "as a queen," but with a total absence of hauteur. This splendid work was formerly an altar-piece in the St. Diego Palace, and was purchased, as we can say of all our Murillos, and not stolen. The large "Magdalen," 65" x 48", from the royal collection in Madrid, and lent by Sir John Sinclair, is a highly finished picture in which the drapery of the ruby-colored robe is wonderful. Sir F. Cook's "Ecce Homo" is sublime. An early work of the master is "Two Monks," representing a Franciscan monk, of whom Murillo was the chosen painter, standing with uplifted eyes, his hands being placed on the head of a sick companion who leans against a tree. This picture being too stiff to roll up was left in the Alcázar by Soult. It was ultimately bought by Mr. Ford.

Murillo appears to have been as great in portrait-painting as he was in ideal or religious art; he unfortunately left but few of persons known to posterity, but they are perfect in point of truth and nature. Four portraits by him are in this exhibition, namely, "Don Luis de Haro"—nephew of Olivarez; "A Man," lent by Mr. Rawlinson, and considered by some to be equal to any portrait by Velasquez; "A Lady," from Lucien Bonaparte's collection; and "Don Andres de Andrade," a canvas 78" x 46", described by some as a repetition of one in the Louvre. It is the full-length portrait of a sinister-looking man whose handsome black dress is relieved by white slashed sleeves, a white *golilla*, or collar, and long white stockings; his hand rests on the head of a dog just as forbidding looking as the Don himself, who was leader of the processions in Seville Cathedral. This picture was bought some years ago by Mr. Brockenbury, but a dispute about the price led to the dealer informing the Government, upon which an old law was enforced prohibiting the exportation of Murillo's works. A poor copy was, however, surreptitiously smuggled into the frame, while the original was smuggled out of Spain. The National Gallery refused to pay £500 for it, upon which Louis Philippe bought it for £1,000.

The Earl of Dudley lends the six pictures, 41" x 53", forming the set of "The Prodigal Son" bought by his father at the Salamanca sale. The "Return of the Prodigal" was in some way separated from its companions and fell into the hands of the dealer who in 1850 offered it to Monsieur Salamanca for an enormous sum, which he refused to pay. Queen Isabella of Spain at once purchased it at that price and sent it to Pius IX. The late Lord Dudley got it from the Pope in exchange for a Bonifacio and a Fra Angelico, and used to chuckle over his success and boast that he was the first man who had got the Pope to sell a picture.

The beautiful painting of "The Flower Girl," from Dulwich Gallery, is doubtless well known for its fine coloring and composition. "The Fruitseller" is an exquisitely pathetic picture of an old man holding a basket of fruit in his right hand, while another hangs on his arm; the left hand leans on a stick, so vividly depicted that one can almost see the hand tremble as he holds it.

There are two rarities in landscape—in which only Velasquez excelled him—afine "View in Pilas," a large composition, 75" x 49", reminding us of Salvator Rosa; and a smaller piece, from the W. Graham Collection, having delicately painted figures both on foot and horseback in the foreground, and in the background a massive castle on a hill.

We close our remarks on the paintings with the mention of Murillo's own portrait painted by him for his children, as a Latin inscription on the frame informs us. In this transcendent portrait—one of the most fascinating of his works—one sees a "head of great capacity and a sound and unsophisticated heart in the facial index of a lofty and generous soul." There was never a more thorough delineation of true, unpretentious manliness. This portrait, the most authentic of all, probably copied for the Prado, was purchased by Sir L. Dundas for £100, sold a few years later for £380, and in 1850 for £829 10s.

"Murillo's character bears a strong resemblance to that of Velasquez and it is not unlikely that the great court painter may have been his model as a man and an artist. Discreet and conciliatory towards friends and rivals, both seemed free from that proneness to boasting and self-glorification inherent in the Oriental blood of Andalusia. Murillo's pupils found him a gentle and painstaking master and in after-life a generous fatherly friend. At his death, caused by a fall from a scaffold (when painting a fresco), they lamented as if they had been his children. Stirling says, "All that is known of this gifted artist tends to the advantage of his fame."

Sir David Wilkie says, "Velasquez and Murillo are preferred, and with reason, to all other Spanish painters as the most original and characteristic of their school. These two great painters are remarkable for having lived in the same time, in the same school, painted from the same people and of the same age, and yet to have formed two styles so different and opposite, that the most unlearned can scarcely mistake them, Murillo being all softness, while Velasquez is all sparkle and vivacity."

"The transcendent success of Murillo was the beginning of the end of the History of Spanish Art. Literature had spread into many channels everywhere but in Spain, and art had associated itself with

social interests at the close of the seventeenth century in France, in the Low Countries and even with us in England. But in Spain it was still limited to the field of church decoration. Spain became poor and the rest of Europe rich. It is said that hardihood of character began to decline from the day of the Conquest of Granada, and all the cardinal virtues were tarnished by the wealth of Mexico and Peru, which ceased when it became necessary. Nothing remained but pride and piety, the one taking the hard form of orthodoxy, and the other depriving the Spaniards of the luxury of arts and letters."

Two specimens of the superstition of Philip IV we give, though at the risk of prolonging the paper. "The *golilla*, a wide stiff linen collar standing out from the neck, was first introduced by Philip who was so delighted with the happy idea that he celebrated the invention by a feast, the King and Court going in procession to the Chapel of the Guardian Angel to render thanks to God for the blessing." He left money for 100,000 masses and in case that should be insufficient, his soul was left residuary legatee!

(To be continued.)



OPENING-UP THE SOUTHEAST SIDE OF WESTMINSTER ABBEY.—THE ROYAL GOLD MEDALLIST FOR '96.—SALT WATER FOR LONDON.—THE TRINITY ALMSHOUSE.—TESTS OF BRICKS AND BRICKWORK.

UNTIL a few weeks ago there stood around the southeast angle of Westminster Abbey a group of small houses of eighteenth-century construction. These have now been demolished and the site cleared. The advantages of this work are important; the Chapter-house of the Abbey, which until 1547 formed the House of Parliament of the Commons of England and which was before practically hidden, now comes well into view, and the Abbey generally gains very much in appearance. So inflammable and so close to the Abbey were these houses that, had they taken fire, such parts of the Abbey as the Chapter-house and Henry VII Chapel would certainly have received serious damage. This menace is now, happily, permanently removed. There seems some doubt as to the use which will be made of the space thus freed. Some time ago a gentleman offered to erect a monumental chapel in connection with Westminster Abbey, and the position now cleared was spoken of as a site for the same. The Royal Commission, however, which originally went into this whole matter and condemned the lately demolished houses, did not agree as to the suitability of this site for the monumental addition. Since Parliament has now met, an opportunity will occur for the discussion of the matter before any decision is reached.

It appears probable that much exception will be taken to the proposal. The question may be raised as to whether there is any great demand for a monumental chapel. It is true, the Abbey itself is already crowded with monuments of all dates, but this fact would seem to afford some guaranty that none but the really "great" should hereafter be granted the honor of burial within the walls. Again, it may be made a matter of doubt whether interment within such an addition as is contemplated would be regarded in the public mind as equivalent to burial in the Abbey itself; if not, there seems no good reason why the chapel should not have an altogether separate site. During the demolition portions of the houses were left in such position and to such height as it is proposed the monumental chapel shall stand. As far as the general public is concerned, this is not perhaps a very successful test; but very few who give an opinion are in favor of anything but a complete clearance. The improvement of the view from the easterly and southeasterly directions is really remarkable, and it is sincerely to be hoped that the Government may decide to leave the site as open as possible and put up the monumental chapel elsewhere.

Mr. Penrose has officially announced that the choice of the Council of the R. I. B. A. for the Royal Gold Medal has this year fallen upon Mr. Ernest George, F. R. I. B. A. That the nomination was popular was immediately evident from the applause with which the announcement was greeted, and more especially as, now that time has allowed a mature judgment to be formed, opinion remains unanimous that to no one could the honor more justly come. Mr. Ernest George has done a great deal of work in South and West England, especially in country mansions and domestic work generally; in London he has built some very large houses and a variety of domestic buildings, as well as business and other premises. He is by no means an old man, though he is far from being the "young man of promise" which he is, apparently, often thought to be. He is considerably over fifty. His skilful planning is always productive of a picturesque and original grouping; his detail is full of thought and care, and invariably pleases with its sense of fitness.

It seems probable that London may soon be in the enjoyment of

a constant supply of sea-water. As long as fourteen years ago this project was seriously entertained and Parliamentary powers were obtained to proceed; but upon close inquiry, it became evident that the demand was far in excess of that contemplated and the opportunities were neglected until it should be possible to carry out a scheme on a wider basis. A new company has now been formed and will apply to Parliament for power early in the ensuing session. It is proposed to draw water from a spot a little to the west of Brighton, where the water is usually in a very pure and clean condition. The water would be pumped from the deep sea into settling reservoirs and afterwards raised to a great reservoir constructed on the summit of an adjacent line of hills, at a height of over 500 feet above the sea-level. Beyond this, it is said, no further pumping would be necessary, the force of gravitation being sufficient to carry the water to the top of all the principal houses in London 50 miles away. The cost of this project is estimated at £450,000, which is to include the main scheme of distribution; and two years would be sufficient for carrying out the work. There is not much difference of opinion as to the practical benefits that would result from a supply of salt water. For the cleansing and watering of the streets and the flushing of sewers, salt water is probably at least as well adapted as fresh; while connection with a salt-water main would be valuable and economical to bathing-establishments, hotels, infirmaries, and institutions of all kinds, as well as private houses. It is claimed that a sea-water supply to London would be practically equivalent to adding 25 per cent to the present fresh-water supply. The scheme seems commendable and, indeed, has not received adverse criticism; it has ever seemed anomalous that filtered water should flush the sewers and wash the streets; it has been a constant item of complaint that the streets and, especially in summer-time, the wood-block paving lacked much in point of sweetness and cleanliness. With a salt-water supply it is stated that "watering the streets would be less frequent and more efficient"; the latter quality is at any rate eminently desirable.

One of the very few spots of interest and beauty which exist in the east end of London stands in danger of being swept away. This is the group of almshouses built in 1695, probably by Sir Christopher Wren, and occupied by retired captains and commanders of the Merchant Service. A tablet in each of the gable ends tells us that

"THIS ALMSHOUSE wherein 28 decay'd Masters & Comanders of "Ships or y^e widows of such are maintain'd was built by y^e Corp^o of "TRINITY HOUSE, AN. 1695. The Brother was given by Cap^t "HEN^y MUDD of Rattcliff, an Elder Brother, whose widow did also "contribute."

This establishment is in the hands of the Corporation of Trinity House which, subject to the consent of the Charity Commissioners, has the sole control of the charity finances. The Corporation is now appealing for permission to abolish these almshouses, which are stated to be in immediate need of expensive sanitary repair, and to dispose of the site for brewery or other purposes for the benefit of the charity fund. The Corporation, as such, has in this connection but one duty and responsibility, that of using to the most advantageous effect the charities over which it has control. The general public, on the other hand, are actuated by a pure and commendable sentiment in making a struggle to retain the almshouses as they now exist. From nautical and mercantile connections the buildings have assumed almost the position of a national memorial; aesthetically they are of the highest value, for the houses are of great architectural merit and contain much that is interesting in the form of stained glass, carving, leadwork and inscription. As an open space, its trees and turf and old-time spirit are very welcome in a wearisome district. At the official inquiry held before the Charity Commissioners, the several societies for the protection of ancient buildings, and the R. I. B. A. were represented; the active sympathy of Mr. William Morris, Sir Walter Besant, etc., has been enlisted, and Mr. F. C. Penrose and J. McVicar Anderson, President and Past-President R. I. B. A., respectively attended in person and spoke earnestly against the proposed demolition. Lord Leighton, too, sent from what has unhappily proved his death-bed a sympathetic message showing himself fully at one with them. The press has done much in making the facts of the case public, and this combined influence may induce the Commissioners to recommend a continuance of the present condition of things, alteration of the sanitary arrangements only being made. Of all the houses in question the smaller part are ancient and of real interest, so it may be that the more modern buildings will be removed, and against this proposal but little could be urged. The Commissioners have not yet published their decision, so that the fate of the buildings is still an open question.

The Science Committee of the R. I. B. A. some time ago instituted a scheme for a series of brickwork tests, with the ultimate view of establishing, if possible, a reliable standard and ratio of strength between individual bricks and brickwork in various cementing materials. Through Sir William Arrol's valuable help, the tests have followed comparatively rapidly upon the preliminaries of the movement. Professor Unwin, too, has kindly given his aid in testing the bricks and cement and mortar employed. The tests are being carried out in a perfectly systematic manner, and the three-months' tests have lately been completed. The Committee will not, however, report until the whole of the tests are complete, and consequently it is desirable that the results at present obtained should not yet be made public. I am, however, in a position to

sketch in outline the scheme of tests. In a preliminary report the Science Committee formulated their suggestions as to the manner in which the tests should be conducted. It was definitely stated that the object of the tests was to ascertain the ratio between the strength of bricks and of the same bricks when built in walls or piers, in other words, to discover the diminution of resistance to crushing, due to jointing and bedding in various cementing materials. Three cementing materials were suggested—lime and sand, hydraulic cement and sand, and cement and sand, the last in two proportions, viz: one to three and one to five; and two classes, at least, of brick, those with and those without "frogs." The bricks should be tested separately, and the cement for tensile strength. The piers should be constructed in the four varieties of cementing matter mentioned, 18" x 18" x 6' high for three, six, nine and twelve months' test; sixteen piers with "frogs," sixteen without and the whole number in duplicate—a total, indeed, of sixty-four piers of identical proportion.

As a matter of fact, though these suggestions have in some respects been followed, important variations have been made. Instead of the presence or absence of the "frog" forming the sole distinction in the bricks employed, a variety of quality and type was introduced. The bricks used were London stock, Gault bricks, Leicestershire reds and Staffordshire blue bricks. These four varieties were built in piers, 18" x 18" x 6' high, in lime mortar of the proportion one of lime to three of sand, and again in cement, one Portland cement to three of sand, eight piers for the three months' test, and eight piers for the test of six or nine months, as may be considered most desirable. The whole were built in duplicate—in all, thirty-two piers of identical proportion. These piers were built in the open air on strong iron boiler-plate, resting on a pair of iron rails some two feet apart. The top of the piers were covered with stout waterproof felt, but beyond this the piers were without protecting conditions. The rails were laid in a straight line and sixteen piers built toward either end: in the middle of the line of rails was erected a powerful hydraulic press, capable of exerting a pressure of four hundred tons. The ram head was capable of being brought flush with the rails on which the piers were built. The method of testing was as follows: the rails were carefully greased and chains made fast to the plate on which the piers rested; a crab and winch then was used to bring the plate along the rails until it was centrally disposed over the ram head, which was some three feet in diameter. The top of the pier was carefully packed with felt in order to give a level bearing against the upper framework of the machine. The pressure was then slowly applied and increased until the pier was completely crushed: careful notes were taken of the pressure and phenomena occurring at various stages, and the longitudinal contraction measured; a series of photographs, too, was taken of every pier from various positions before and after crushing and during the actual process.

It has been the effort of the promoters of these tests to reproduce so far as is possible, the actual conditions by which brickwork in ordinary practice is affected. Thus the bricks were not picked, but, as well as the cementing materials, obtained from the manufacturers without information being given as to the purpose to which they were to be applied. The piers were built in the usual bond by bricklayers of ordinary qualifications. No piers of small height were built, as it was felt impossible practically to compare results of piers of, say, six feet with those of two feet high. The height of six feet was chosen as the greatest that could be moved and manipulated without much risk of damage. The age of the piers was fixed at three and nine months, because, although by three months the work has not attained its ultimate strength, not often in actual practice is brickwork built more than three months before receiving its maximum load; the nine months' tests are, of course, valuable for comparison. The tests were carried out in a vertical position, and in every case the pier was transferred to the ram head smoothly and without much possibility of even slight shaking. Objection may possibly be taken to the speed with which the pressure was applied, none of the piers requiring more than half an hour to be completely crushed. But I have it from a high technical authority that had the pressure been applied so slowly that a month should intervene before crushing took place, the measurement of pressure would probably read approximately as at present, so steady and regular is the hydraulic ram in its movements.

Comparatively little has been done hitherto in the direction of brickwork tests, owing, no doubt, to the great expense attendant upon experiments of this nature. The most important tests have been those organized by the Germans¹ at Berlin under Dr. Böhme, who based a ratio upon his results, and those valuable experiments carried out at the Watertown arsenal by your own Government about ten years ago: very remarkable results were obtained during the latter experiments in the testing of hollow piers and those with joint broken only at every sixth course. It is perhaps to be regretted that something of a like nature was not included in the present tests. Important confirmation or new facts might conceivably have been forthcoming had the present opportunities been thus utilized. But though the present tests are primarily of local importance, yet they will be of universal interest if it be found possible to establish the ratio successfully. There is no great difficulty in finding the ultimate strength of any local brick and any cementing material.

¹ See Unwin's "Tests of Materials of Construction."

With these facts given, it is hoped by consulting the ratios which this scheme of tests will afford, it may be possible to arrive at a tolerably correct estimate of the ultimate strength of brickwork formed of such materials.

EXPERIMENTS ON ARCHES.

AN extremely valuable and interesting series of experiments have been carried out by the Austrian Association of Engineers and Architects, on model arches of spans ranging from 4.42 ft. up to 75.4 ft. A sum of upwards of 4,000*l.* sterling was expended, though the work was to a large extent done gratuitously. The arches of 4.42 ft. span were seven in number, and of the following general particulars and dimensions:

Number.	Material.	Thickness at Crown.		Weight of Arch per sq. ft. covered.	Deflection of Crown under a load of 1,638 lbs. per sq. ft.
		Thick.	Rise.		
1	Schober special bricks.....	6.29	1.58	130	.46
2	Hönel special bricks.....	3.94	1.97	71.6	.62
3	Schneider special bricks.....	3.94	1.58	128	.94
4	Glücksels special bricks.....	3.94	1.58	125	1.63
5	Ordinary bricks, radial joints.....	5.90	5.70	71	
6	Ordinary bricks, longitudinal joints.....	5.90	4.91	77	
7	Rammed concrete.....	2.95	4.52	92	.77

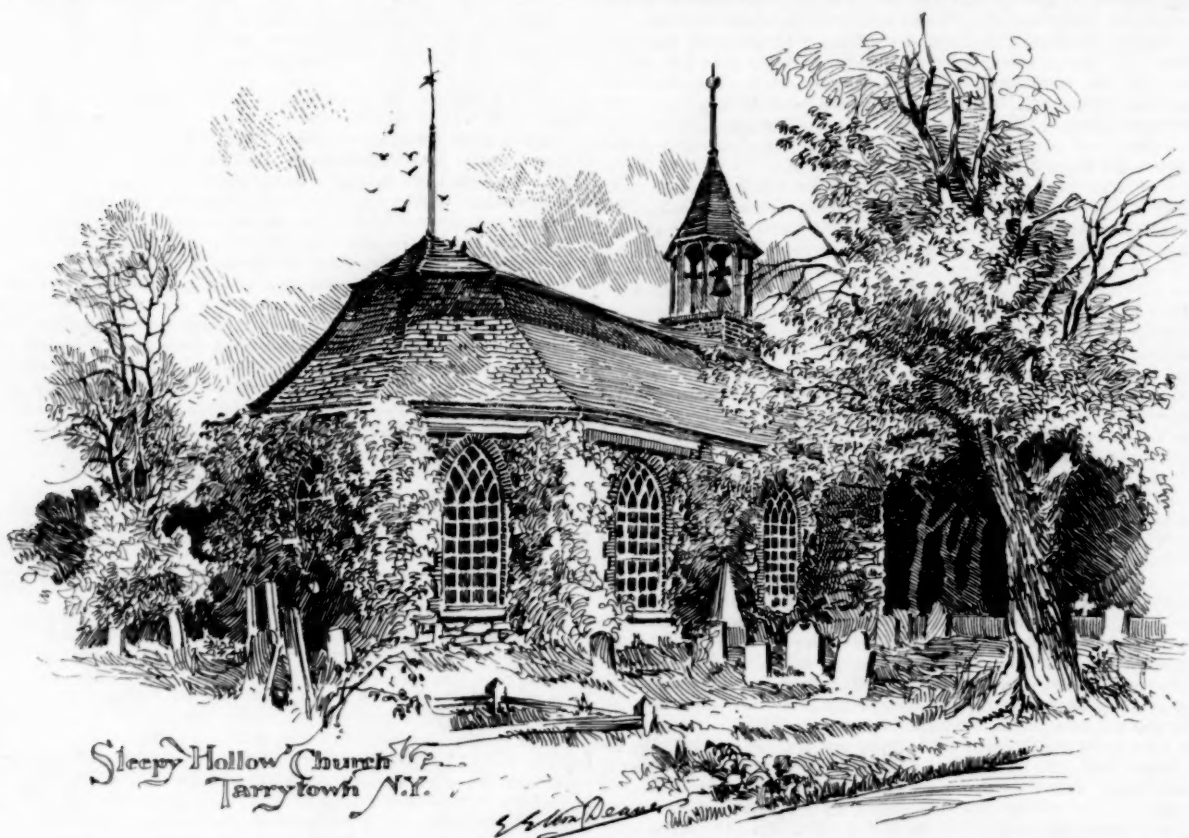
The abutments for these arches were I-beams firmly coupled together by round tie-rods and channels. The arches were levelled up with earth packing, and loaded with pig-iron distributed over the whole span. Failure in the case of Nos. 3 and 4 took place with a load of about 1,638 lbs. per square foot, but the other arches carried this without showing any signs of rupture. The deflection at the crown was measured in each case at frequent intervals, and the results recorded. In the case of Nos. 3, 4 and 6 the deflection increased more rapidly than the load, but with the other arches a fair proportionality between deflection and load was maintained. The brick arches were laid in lime mortar, and not in hydraulic cement. The concrete arch consisted of one part of Portland cement with five parts of sand. Experiments were next made on arches having a span of 8.85 ft. In this case the load was distributed over one-half the span only. The results obtained are shown by the following Table:

Number.	Material.	Span.	Thickness at Crown.		Weight of Arch per sq. ft.	Breaking Load, lbs. per sq. ft. on half span.	Vertical Deflection at Crown under Load.	
			ft.	in.	in.	lbs.	At Rupture.	Of 400 lbs. per sq. ft.
1	Rammed concrete.....	8.85	3.35	9.05	286	1,127	.94	.34
2	Ring of cement reinforced with wire netting (Monier's system).....	..	1.95	10.23	230	1,217	1.01	.34
3	Ring of cement (Monier's system) levelled up over the haunches with concrete.....	..	2.17	10.23	505	1,320	1.22	.18
4	Arch of ordinary bricks.....	..	5.51	9.84	248	883	1.87	.77
5	" " Hönel bricks.....	..	3.94	5.31	166	491	1.53	1.45
6	" " corrugated iron.....	..	..	9.84	14	973	1.06	.45
7	" " corrugated iron with L-iron riveted along it at the springing.....	..	..	..	20	1,100	1.14	.47

In no case was the deflection proportional to the load, though in the case of No. 6 it was nearly so. In all these cases the abutments consisted of I-beams efficiently tied together. Some experiments were next made on a concrete arch of 13.3 ft. span, 16.1 in. rise, and 3.94 in. thick at the crown. This arch sprang from regular skew-backs, and failed when a load of 790 lbs. per square foot was distributed over one-half the span from abutment to crown. The deflection of the crown at rupture was about $\frac{1}{4}$ in., but a point midway between springing and crown had deflected $\frac{3}{8}$ in. before failure occurred. A Monier arch of similar dimensions, tested in the same manner, failed under a load of 872 lbs. per square foot, but both arches showed cracks at the same load, viz, 614 lbs. per square foot. The deflection of the Monier arch at the crown when failure occurred was $\frac{3}{8}$ in., and at a point half-way between abutment and crown $\frac{7}{16}$ in. A Melan arch was next tried. In this construction steel arch ribs of I-section are imbedded in the concrete, being spaced in the present instance 3 ft. 4 in. apart. The I-beams in question were 3.15 in. deep, and the concrete-filling was of the same thickness, being flush with their upper and lower flanges. The span was 13.1 ft., and the rise 11.4 in. The arch was loaded on one side only, and failed when 3,370 lbs. per square foot was reached, breaking in three pieces under this load. The first cracks were observed under a load of 3,120 lbs. per square foot on the loaded side.

The next arches tested were two of 32 ft. 9.7 in. span and 3 ft. $3\frac{1}{2}$ in. rise, one being of Monier cement and the other of rammed concrete. Each was 13 ft. 1.5 in. broad, and carried a single line of standard-gauge railway. The Monier cement arch was a reproduction of one constructed for actual use in 1889. It consisted of a ring of cement 5.9 in. thick at the crown, and 7.87 in. thick at the springings. The cement was, as usual on Monier's system, reinforced with wire-netting. The dead load on the arch, including filling over haunches, ballast and track, amounted to 307 lbs. per square foot. As a preliminary, an engine and tender were run over the bridge and the deflections at the crown and at quarter-span noted. The locomotive had six wheels, the loads being distributed as follows: leading axle, 10.3 tons; driving axle, 13 tons; trailing axle, 13 tons. The tender had four wheels, the load on each axle being about 9.1 tons. The maximum deflection noted was $\frac{1}{2}$ in., of which one-half was permanent set. Still heavier locomotives were then run over the structure, the deformations being noted at ten different points. No further deformation or permanent set was noted under these loads. Steps were then taken to test the arch to destruction, by piling rails over one-half the span. With 90 tons of rails thus distributed, a crack was observed in the neighborhood of the springings, extending through nearly one-third the total thickness of the arch. On increasing the load to 100 tons, further cracks were noted. This load was left on for $3\frac{1}{2}$ hours, and the deflections recorded. The load was then totally removed, and the permanent set noted, which amounted to $\frac{3}{4}$ in. at the crown.

We now come to a still more important series of experiments, in which five arches, each of 74.5 ft. span and a rise of about one-fifth the span, but constructed of different materials, were tested to destruction. The work was done in a quarry at Puckersdorf, where excellent foundations for the abutments, and cheap material for the construction of the arches themselves, were available. Each arch was 6.65 ft. wide. A platform supported on six sets of columns, the feet of which rested directly on the extrados of the arch, extended in each case from one abutment to the crown, and the testing was effected by piling rails on this platform. The first experiments were made upon an arch of cut-stone, and on one of brick. The stone used was a fairly hard limestone of excellent quality. The voussoirs were 1.97 ft. thick at the crown and 3.6 ft. deep at the springings. The mortar used was mixed in the proportion of 5 cwt. of Portland cement to 35 ft. of clean sand. The brickwork arch had precisely similar dimensions to the foregoing. The bricks used were machine pressed, and were thoroughly wet before use. The same quality of mortar was employed. After the work was finished the centres were left in place for some weeks. The whole outer surface of the arches was then rendered with a thin coat of cement, so as to detect cracks more readily. The centres were then removed, and the work of loading the arches proceeded with. The stone arch gave way when the load piled on the platform reached an amount equivalent to 1.99 tons per foot run, and the brick arch when the load reached 1.81 tons per foot run. Up to the point of rupture the stone arch gave no signs of incipient failure, but in the case



The load was then replaced and finally increased up to 180 tons of rails piled on the half-span, when complete failure occurred. The vertical deflection at the crown, under a load of 80 tons, was .36 in., and at the quarter-span .32 in. At 90 tons the corresponding deflections were .44 in. and .42 in., the first crack occurring at this load as already noted. At a load of 170 tons the deflection at the crown was 1.28 in., and at the quarter-span 1.03 in. The rammed concrete arch was of the same span, width and rise; it was, however, 16.4 in. thick. It was built of concrete consisting of one part cement, two parts sand and one part broken stone. The testing was commenced when the concrete was 224 days old. On loading one-half of the span with rails, the first cracks were noted when the load reached 47.8 tons, or 512 lbs. per square foot. These cracks were, for the most part, confined to the spandrel walls in the immediate neighborhood of the abutments. Under a load of about 90 tons, however, a crack was perceived in the arch ring about 2 ft. from the crown on the loaded side. The load was then removed, the deformations noted, and the load replaced and carried up to 195 tons, which was carried for three days without failure taking place. The maximum deflection at the crown was 1.14 in., and at quarter-span on the loaded side, 1.12 in. At quarter-span on the unloaded side the deflection was .49 in. On removing the load the permanent set at these three points was, respectively, .62 in., .66 in. and .30 in.

of the brick arch, cracks declared themselves previously, which were apparently caused by the failure of the mortar, the bricks themselves being intact. After removing the ruins, a third arch of similar span and rise was constructed between the same abutments, the material being rammed concrete. The thickness of the arch ring was, however, uniform, being 2.3 ft. The body of the arch consisted of 1 part Portland cement, 2 parts broken stone, 3 parts gravel and 3 of sand, but for the intrados and extrados a higher quality of concrete was used, that for the former consisting of 1 part Portland cement, $\frac{1}{2}$ part broken stone, $\frac{1}{4}$ part gravel and 1 part sand, whilst the latter consisted of 1 part Portland cement, $1\frac{1}{4}$ parts broken stone, $1\frac{1}{4}$ parts gravel and 2 parts sand. The total quantity of concrete in the ring was about 50 cubic yards. Two months after completion the centres were removed, during which time the arch was protected from the sun and frequently watered. The testing commenced three weeks after the centres had been removed. Failure took place under a load equivalent to 2.24 tons per foot run on the loaded half of the arch. The next arch to be tested was constructed on the Monier system, the span and rise being as before, while the thickness of the ring was 1.97 ft. at the springings and 1.15 ft. at the crown. The concrete used consisted of 3 parts of river sand to 1 part of slow-setting Portland cement. The centres were removed at the end of two months, and arrangements made for testing. Failure took place under a load equivalent to 3.09 tons per foot run of

the loaded half. Great difficulty was found in removing the ruins. The metal reinforcement was found intact, having bent, but not broken, at the points of failure.

The final experiments were made upon a steel arch of the same rise and span as the four preceding ones. This consisted of two steel ribs fixed at 5.9 ft. centres and rigidly braced together. Each rib was of girder section 12.6 in. deep. The total weight of the steel work was 15.6 tons. On testing with a load of 82½ tons distributed over half the arch, no serious deformation was observed. The load was then removed, and on the next day 158 tons of rails were piled up on the loaded side. The deflection was then considerable, but agreed well with the calculated result. This load was left in place throughout one night, after which rails were piled on the side not previously loaded till a total of 175 tons was reached. The deflection was still further increased, but not a single rivet yielded. The load was then removed, and the experiments terminated. From their experiments the committee concluded that in arches of large span the calculations may safely be based upon the theory of the elastic arch. With a view to distributing the load as much as possible in the case of masonry arches, the extrados should be covered with a layer of ballast, which should be, at least, 3 ft. thick in the case of railway bridges. The safe crushing load on such arches may range from one-tenth to one-fourth the ultimate resistance of the material. — *Engineering*.

BOOKS AND PAPERS

MR. A. E. DANIEL¹ has accomplished a useful task — a labor of love — in giving us a concise history of the churches of the City of London. His object has been to describe the style of architecture; where possible, to give a short history of the church and parish, and to add the dimensions and a list of the monuments.

Surely never was so fortunate an architect as Wren, for to whom else was the opportunity ever given to build a huge cathedral and forty-nine parish churches in the same city? And yet, in spite of the beauty of his churches, we go on demolishing them with the lightest of hearts, and build up, elsewhere, feeble imitations of thirteenth-century Gothic, or Lombard, or what not. Fifteen of Wren's buildings have gone already, and more are going; yet we prate about the Italians' vandalism, and we have a society for the preservation of ancient buildings, the members of which send advice *gratis* to the benighted foreigner. Why cannot Wren's work be rebuilt elsewhere, if it must be destroyed, instead of modern red-brick imitations of older buildings? So the world wags, and possibly the little fire-demon who arranged the destruction of London — the Loki of the seventeenth century, who played into the hands of England's greatest architect and made him famous — may yet see, from the nether world, the destruction of all his protégé's work. Or will the tide turn, and will our descendants prefer the originality of Wren, to the imitative faculties of the modern architects?

The great fire left eight churches more or less damaged, of which All Hallows, Barking, is one of the oldest, having belonged to the abbess and convent of Barking in Essex, founded at the end of the seventh century. It escaped the great fire in the narrowest manner possible; as Pepys relates in his diary, for September 5, 1666: "About two in the morning my wife calls me up, and tells me of new cries of fire, it being come to Barking Church, which is at the bottom of our lane. . . . But going to the fire, I find by the blowing-up of houses, . . . there is a good stop given to it . . . it having only burned the dyall of Barking Church, and part of the porch, and was there quenched. I up to the top of Barking steeple, and there saw the saddest sight of desolation that I ever saw." The then lord mayor, Sir Samuel Starling, does not seem to have been the most generous of men, for, says Pepys, when his house was in danger and the next house burning, he "did give 2s. 6d. among 30" men who helped to put out the fire. The church contains several brasses, and at its font William Penn was baptized on October 23, 1644.

Not the least curious part of the City churches is the surname many of them possess, as, for example, St. Andrew Undershaft, the "shaft" being a may-pole of greater height than the church. Here is the monument, in terra-cotta, erected to the memory of John Stow, the historian of mediæval London, a man who after devoting himself to collecting all kinds of curious knowledge, which cost him "many a weary mile's travel, many a hard-earned penny and pound, and many a cold winter night's study," was allowed to drop into such abject poverty that he petitioned James I for a license to collect alms for himself. The letters-patent were published from the pulpits, and one munificent parish contributed 7s. 6d.; but although the license was renewed for a second year, poor Stow died miserably, "so that it is feared," says Strype, "the poor man made but little progress in the collection." The old priory church of St. Bartholomew the Great is well known, but it may not be equally well known that William Hogarth was baptized there. The family lived in the neighborhood, and the painter taking an interest in the rebuilding of the hospital, gratuitously painted six pictures upon

the staircase, representing Rahere's dream, and the monk laying the foundation-stone of his church. The present is an age of disillusion; and so we are told that the derivation of St. Giles Cripplegate, in spite of the saint being the patron of cripples and lepers, has nothing whatever to do with them, and that "cripplegate" is simply an Anglo-Saxon term for a covered-way in a fortification. It was an old church founded in 1090, but has been much restored from 1623 to our own times. It is a curious fact that a great many of the City churches were restored about that time, only to be consumed by the great fire a few years later. The carver of the altar-piece is thought to be the identical artist to whom we owe the colossal figures of Gog and Magog in the Guildhall. Two celebrities were connected with St. Giles — Bishop Andrewes was its vicar from 1588 to 1605, and John Fox, the martyrologist, was buried there. Sir Martin Frobisher, the explorer of the arctic regions, and a still greater man, John Milton, were also buried there; but no monument was erected to either of them until many years later. Oliver Cromwell was married there at twenty-one years of age to Elizabeth Bouchier.

A great many of the City churches possess handsome official staves, St. Giles's being of massive silver, surmounted by a model of the cripplegate. Daniel Defoe was born and died in the parish, but was buried in Bunhill Fields. In the churchyard may be seen a bastion of the old London wall measuring 36 feet in width and 12 feet in height — the most perfect fragment yet remaining; and hard by is the site of another curiosity, Crowder's Well. "The water of this well," says Strype, "is esteemed very good for sore eyes, to wash them with; and is said to be also very good to drink for several distempers. And some say it is very good for men in drink to take of this water, for it will allay the fumes, and bring them to be sober." If so, it is a pity we have it not in our times; but it must be allowed, also, that the plague made great havoc among the drinkers thereof.

The modern crowd which swarms in Bishop's Gate scarcely knows that great St. Helen's owes its foundation, possibly, to Constantine, in memory of his mother. It was a priory of Benedictine nuns; hence the peculiarity of its construction — two parallel naves, each 122 feet long; the nuns' choir being raised somewhat higher than the other. Crosby Hall, hard by, known to most visitors as a restaurant, originally formed part of Sir John Crosby's mansion, and one of St. Helen's monuments (and there are many) is in memory of the knight. It is an exceedingly fine altar-tomb with beautifully carved recumbent figures.

St. Catherine, Cree, is a majestic church in the Classical style, said, without sufficient evidence, to have been designed by Inigo Jones, and to be the burial-place of Hans Holbein.

The early history of St. Alban's dates back to King Offa, who is said to have had a palace in Wood Street; but the present church was rebuilt by Sir Christopher Wren. It is much modernized, and cannot compare, as regards woodwork, with All Hallows, Lombard Street.

St. Andrew's, Holborn, was the scene of the marriage of William Hazlitt and Sarah Stoddart, at which Charles Lamb was best man, and Mary, bridesmaid. "I am going to stand godfather," wrote Lamb to Southey three months later, *apropos* of another event. "I don't like the business. I cannot muster up decorum for these occasions; I shall certainly disgrace the font. I was at Hazlitt's marriage, and had like to have been turned out several times during the ceremony. Anything awful makes me laugh. I misbehaved once at a funeral. Yet I can read about these ceremonies with pious and proper feelings. The realities of life only seem the mockeries." In St. Andrew's, also, was baptized Benjamin Disraeli, at twelve years of age.

The monument to Inigo Jones, the builder of the Banqueting House, Whitehall, may be found in St. Benet's, Paul's Wharf.

One of Wren's most beautiful churches is St. Bride's, or Bridget, Fleet Street — a magnificent interior attached to an exquisite steeple, tapering up from story to story — respectively in the Tuscan, Ionic and Composite orders, and culminating in an obelisk and vane. Richardson, the prosaic novelist and rival of Fielding, was buried in this church.

Christchurch, Newgate Street, was originally the Church of the Grey Friars, which was begun by Queen Margaret, second wife of Edward I, and daughter of Philippe le Hardi. The queen was buried there, as was also Isabella, wife of Edward II, and Joan of Scotland, their daughter. All the monuments were destroyed at the dissolution, as effectually as the royal tombs at St. Denis. Another worthy who was laid to rest at Christchurch was Richard Baxter, the author of the "*Saint's Everlasting Rest*." It is at Christchurch that the "spital" sermon is preached to the lord mayor and aldermen, at which the Blue-coat boys are present in the galleries.

St. Clement's, Eastcheap, is celebrated as the scene of the lectures of Pearson, upon the Creed; and another noted man, Miles Coverdale, the translator of the Bible, was rector of St. Magnus, a church completed by Wren in 1676, the original building having been destroyed; but he was buried at St. Margaret's, Lothbury, where there is a beautiful carved-oak screen.

St. Mary-le-Bow has another beautiful steeple, light, elegant and original. It acquired the name, in its latin form "*De arcubus*," from the stone bows upon which it was built. "From the Latin title, also, is derived the name of the Court of Arches, which, before the great fire, held its sittings at St. Mary-le-Bow." It is now used

¹ "*London City Churches*." By A. E. Daniel.

for the confirmation of the election of bishops; and it is from this church that the saying comes as to the true and veritable Cockney—"born within hearing of Bow bells." Beneath the church is the old Norman crypt, formed of three aisles divided by massive columns.

St. Michael, Paternoster Royal, has a curious origin. It derives its second name from a lane named La Riote, which was inhabited by wine merchants who traded with the town of that name, near Bordeaux. It was rebuilt by Sir Richard Whittington, who founded the College of St. Spirit and St. Mary.

Most of these churches possess fine carved woodwork: pulpits with sounding-boards, the seats, the altar-pieces and font covers; and some of the wrought-iron work of the corporation pews is very noticeable.

Tradition says that the first Christian church in London was formed by Lucius, the first Christian king of "Britaine," in 179. He also formed an archiepiscopal see which endured until the coming of Augustine, who transferred the see to Canterbury. This ancient church was St. Peter, Cornhill, rebuilt by Wren, and of which Bishop Beveridge was rector from 1672-1704.

The most noble of Wren's churches is generally considered to be St. Stephen's, Walbrook, a circular domed crown supported upon an octagonal base. It has five aisles, of which the central one is the broadest.

Mr. Daniel's book is marred by some wretched illustrations; the line and chapter headings, giving little sketches of the churches, might pass, and the photographs are possibly as good as they could be, considering the difficulty of taking these semi-dark interiors, but some of the wash-drawings are lamentable, notably that of St. Magnus, which appears to be a "fancy" sketch as regards the warehouses; the steamer and small boat can only have come out of a toy-shop. Another protest might be made against the uncut, jagged leaves. Our fathers invented a delightful machine to cut the leaves of books, and rejoiced thereat, as trouble and dirt were avoided. Now, knowing better, we are returning to the tiresome rough edges, which cannot be turned over rapidly, and which attract the book's greatest enemy—dust. Alas! *c'est la mode!*

THE science of perspective¹ may be approached from two different standpoints—that of the architect, for whom it is a branch of the art of draughtsmanship; and that of the mathematician, who regards it as a department of descriptive geometry. The application of the scientific principles of perspective to architectural draughting requires the constant exercise of the imagination. Planes, lines, points and curves, traces and intersections the draughtsman must picture to his mind before they take on their real significance; and any text-book designed primarily for the draughtsman fails of its highest usefulness if it does not recognize this fact. It should, accordingly, as far as possible, explain at every step the bearings of the abstract rules and principles upon the pictorial representation of architectural forms. There should be also abundant illustrations of practical applications of these principles, in the form of problems approximating, as nearly as possible, to those of the architect's office, in which the student should be guided through every step from the first to the last. By some such treatment as this, life and interest may be given to the dry bones of the geometry of perspective, and the student be willingly led on and up to the higher refinements of the science.

A text-book for use in the class-room is a different affair. Here the end is disciplinary and educational first, practical only in a secondary way. Not only is the standpoint of treatment that of the mathematician rather than of the artist, but it is the blackboard rather than the drawing-table which is kept in view. The detailed applications, the solutions of special problems, the practical short-cut methods, may be left for development by the teacher, or for later mastery when the student has become a draughtsman in an office.

This is the point-of-view taken by the author of "*Principles of Architectural Perspective*." The few specific problems he discusses, though exclusively architectural, are of an elementary nature. The book is, as its title implies, a text-book of principles, rather than of applications. The draughtsman in search of a handy guide to perspective will look in vain through this little book for solutions of the specific difficulties he encounters. It will not tell him how to represent a recessed arch, a dome on pendentives, a circular cornice, or a Corinthian capital in perspective. The book has been conceived, like the same author's earlier one, "*Shades and Shadows*," primarily with reference to the class-room, and seeks merely to lay a solid foundation of geometrical principles. The explanations, problems and illustrations which are contained in its forty-two pages and eleven plates of figures, are, consequently, of a purely scientific and disciplinary character. It is doubtful if the fundamental principles of perspective could be more briefly and succinctly stated than in the introduction and first chapter. Particularly noteworthy are the author's brief discussion of the difference between the real and apparent horizons, his explanation of distortion in perspective drawings and of the parallelism of vertical lines, and the distinction made between vanishing traces, points and lines in space and their perspectives in the drawing. The discussion of these points indicates the thoroughness and accuracy of the author's

own mastery of their relations. One may, however, question the necessity of carrying into the wording of the rules given in the first chapter, the distinction between the real vanishing-points and traces and their perspectives. It would have been quite sufficient to explain that, in the absence of contrary statements, the words "vanishing-point," "vanishing-trace," "horizon," refer to the perspectives in the drawing, not to the points and lines in space. This simplified expression would improve as well as shorten §§30-34 on page 9. There are a few other cases where the wording might be changed to advantage; and defective proof-reading has occasioned a number of errors which in later editions will, doubtless, be corrected.

Chapter II is devoted to the fundamental geometrical problems involved in perspective drawing. These are nine in number, and are treated with the same brevity which marks the preceding chapter. We cannot help feeling, however, that this part of the subject, always the most difficult to make presentable and attractive, has here been made unnecessarily dry. The system of notation employed is logical, but does not appeal to the eye, and is in this respect inferior to that of Professor Ware's "*Modern Perspective*." The lettering is always a bugbear in geometrical study, and every device should be employed in a text-book to lighten the weary search for B^H , SP^V , e^H , etc., among a maze of lines and letters. The various classes of lines can be differentiated by different methods of breaking, dotting or shading them; the notation may be so devised as to appeal instantly to the eye, and too frequent reference to mere letters and numbers avoided by describing the lines or points required, so that they are instantly recognized. This requires an increase in the number of words used, but words are not objectionable when they facilitate understanding. In this respect Chapters III, IV and VII, as well as II, leave something to be desired. Chapter II is otherwise a masterpiece of condensation.

The following chapters discuss in turn the method of the "Revolved Plan," "Direct Methods of Division," "Curves and Distortions," "Roof-lines and Parallel Perspective," "The Method of the Perspective Plan" and "Shadows in Perspective." It is hard to imagine how so much information could be conveyed in fewer words than in these chapters. They are as condensed in style as they are comprehensive in range. Chapter VII is open to criticism for its disparagement of the method of the perspective plan, to which it gives less than a page of text. The other two pages are devoted to the subordinate problem of laying off dimensions on perspective lines, which might better have formed a part of Chapter IV. There is no recognition of the usefulness of this method when the complete plan is wanting, and the design is such as to facilitate laying out perspective plans of the two visible faces of the building at different levels. The chapters on "Curves and Distortion," and on "Shadows in Perspective" are, on the other hand, in spite of their brevity, very useful, suggestive and well handled. It is, doubtless, through mere oversight that the word "shadow" has been omitted after "perspective" in the second line of §135.

The drawing of the figures deserves commendation for its precision, clearness and force. The plates all open out beyond the margin of the pages of text, making reference easy for any figure. The small size and compactness of the book, clean type and good margins, make it exceptionally handy and comfortable to use. It is an excellent text-book for classes under competent instructors, and for ambitious and faithful home students who have a foundation of geometrical training. We cannot help feeling, however, that the book might have been made available for a much larger class of readers if the pedagogic and mathematical point-of-view had been less closely adhered to. There are ten, perhaps fifty, young men outside the architectural schools to one in them, who would welcome a really scholarly, and yet compact, practical treatise on perspective, less expensive and formidable than Professor Ware's, more thorough than other existing manuals, and to them this work in hand will hardly appeal. We wish Mr. Lawrence might follow it up with a sequel or supplement, taking up a few actual and typical problems such as the architect has to handle in practice, and leading the student by successive plates through all the operations of their solution, up to the completed drawings.



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

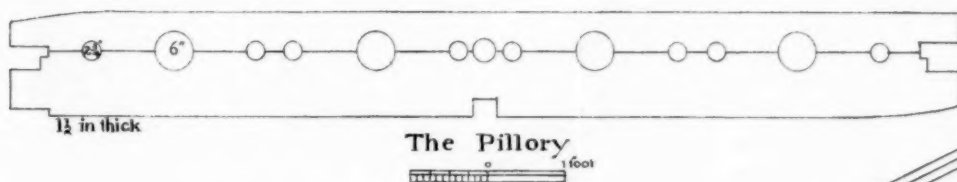
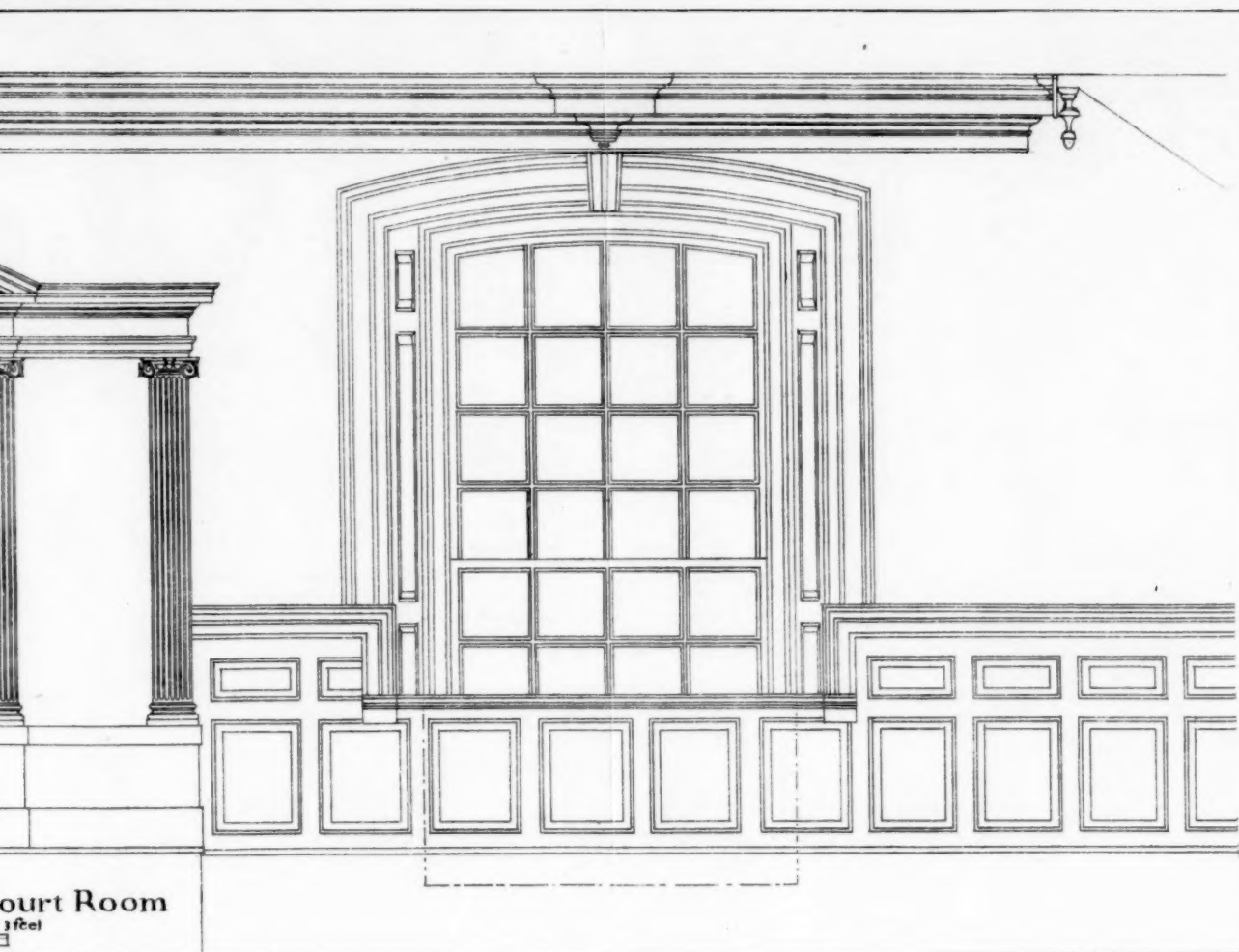
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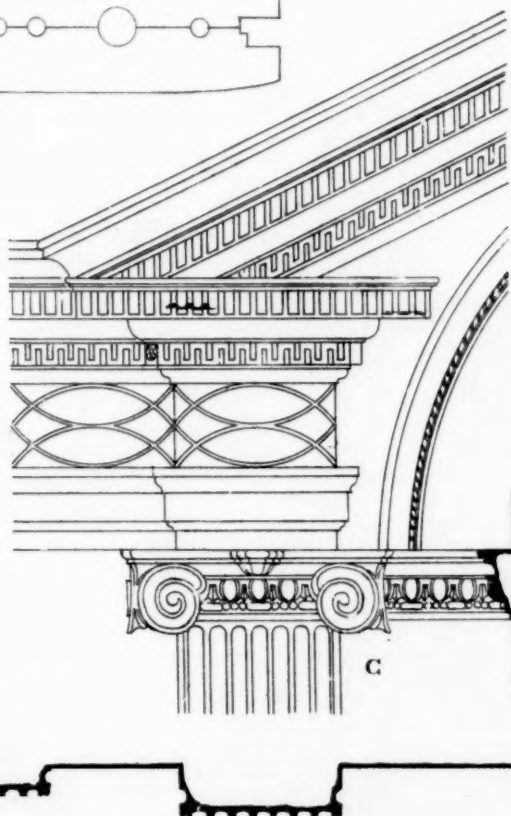
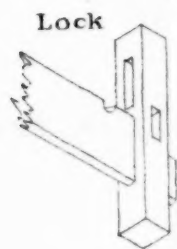
DETAILS OF THE RHODE ISLAND STATE-HOUSE, NEWPORT, R. I. MEASURED AND DRAWN BY MR. F. G. GULBRANSON, ARCHITECT, BOSTON, MASS.

IN 1739 the General Assembly authorized the building of a new Court-house at Newport, and the structure now known as the State-house was soon after begun from drawings by Richard Munday. It was ready for occupancy in 1741.

¹ "*Principles of Perspective*." By Wm. H. Lawrence, Instructor in Architecture, Massachusetts Institute of Technology. Boston. 1895.

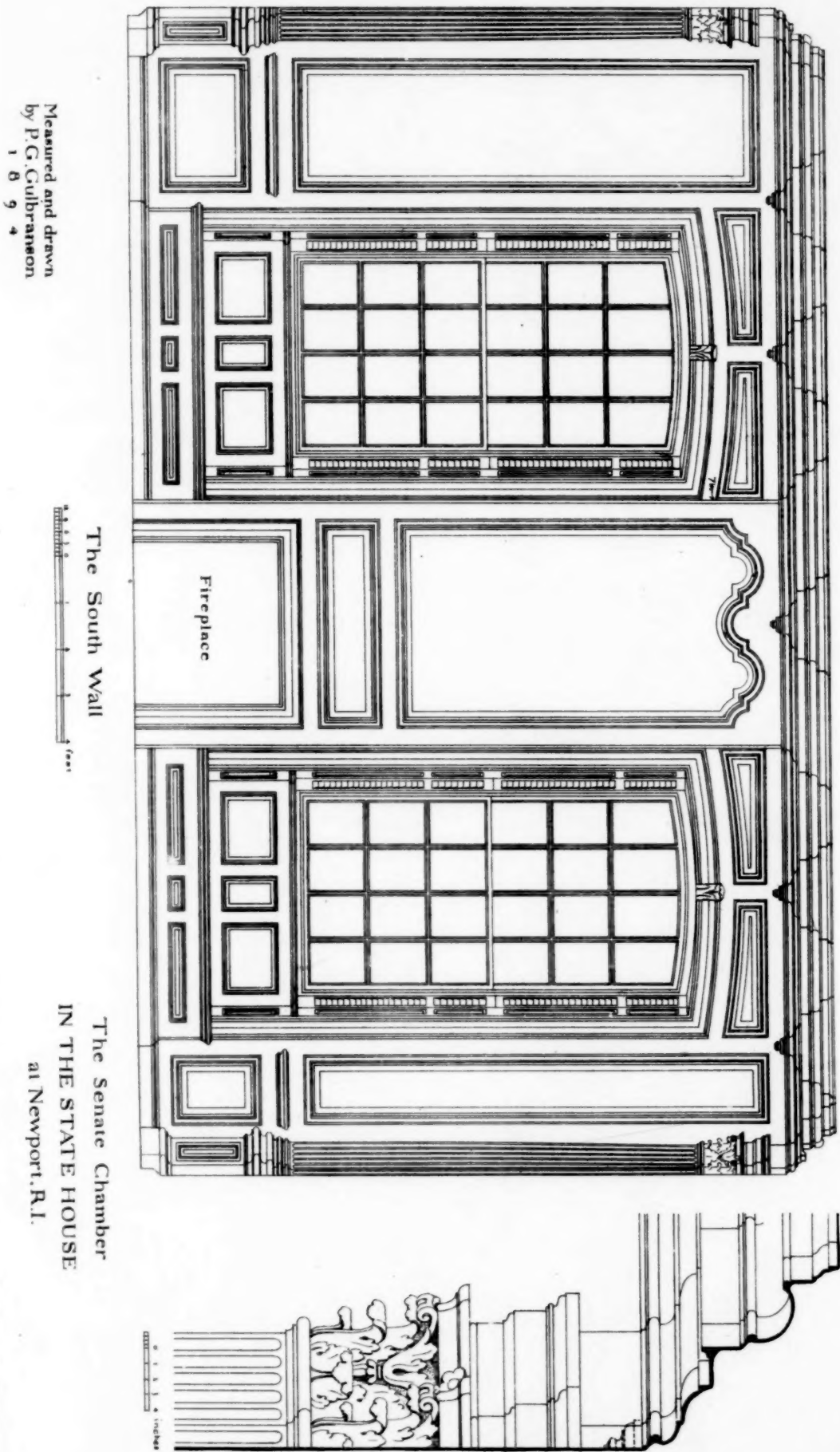


DETAILS
from the
STATE HOUSE
AT
Newport, R.I.

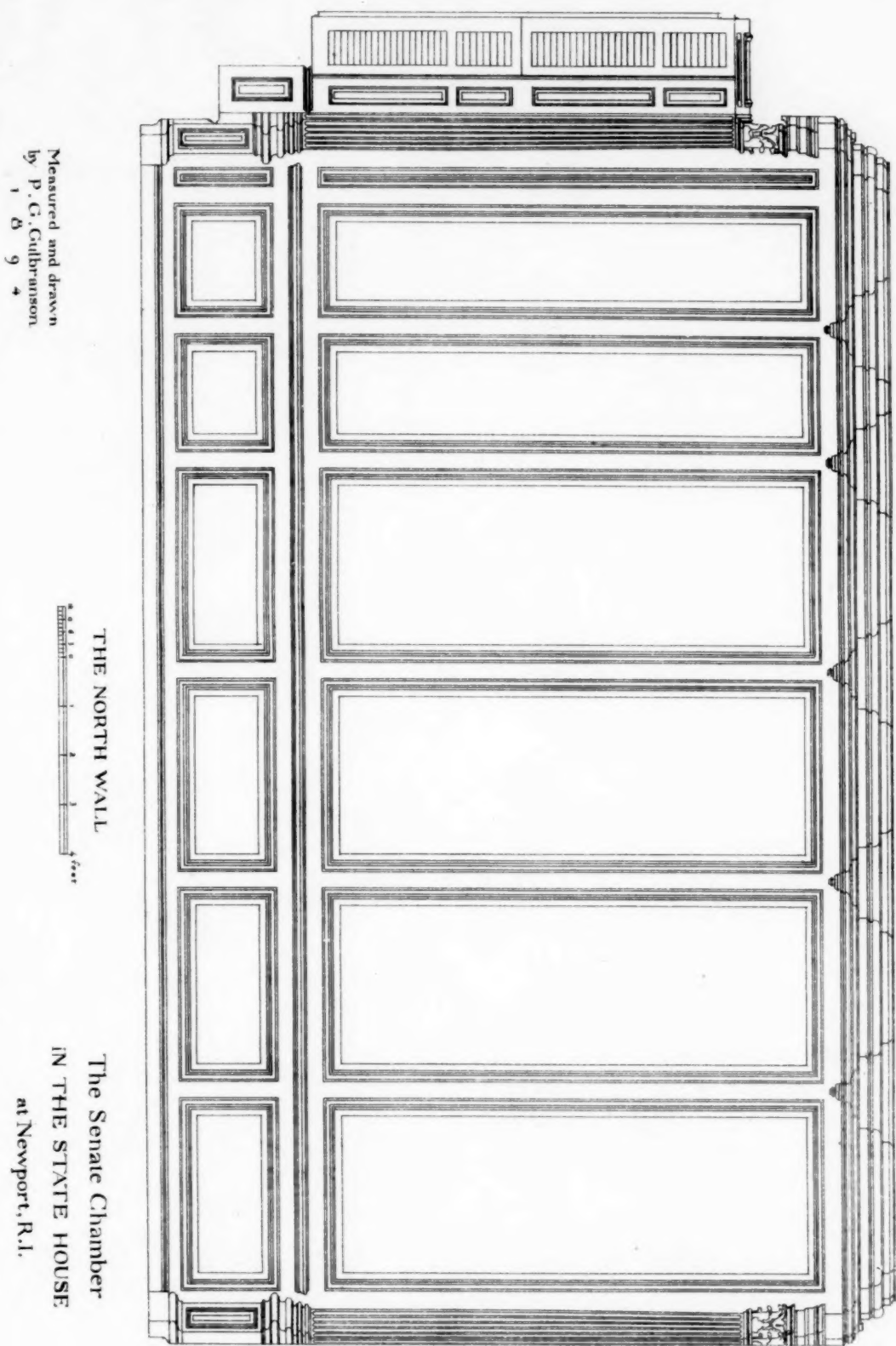


Measured and drawn
by P. G. Gulbranson
1894

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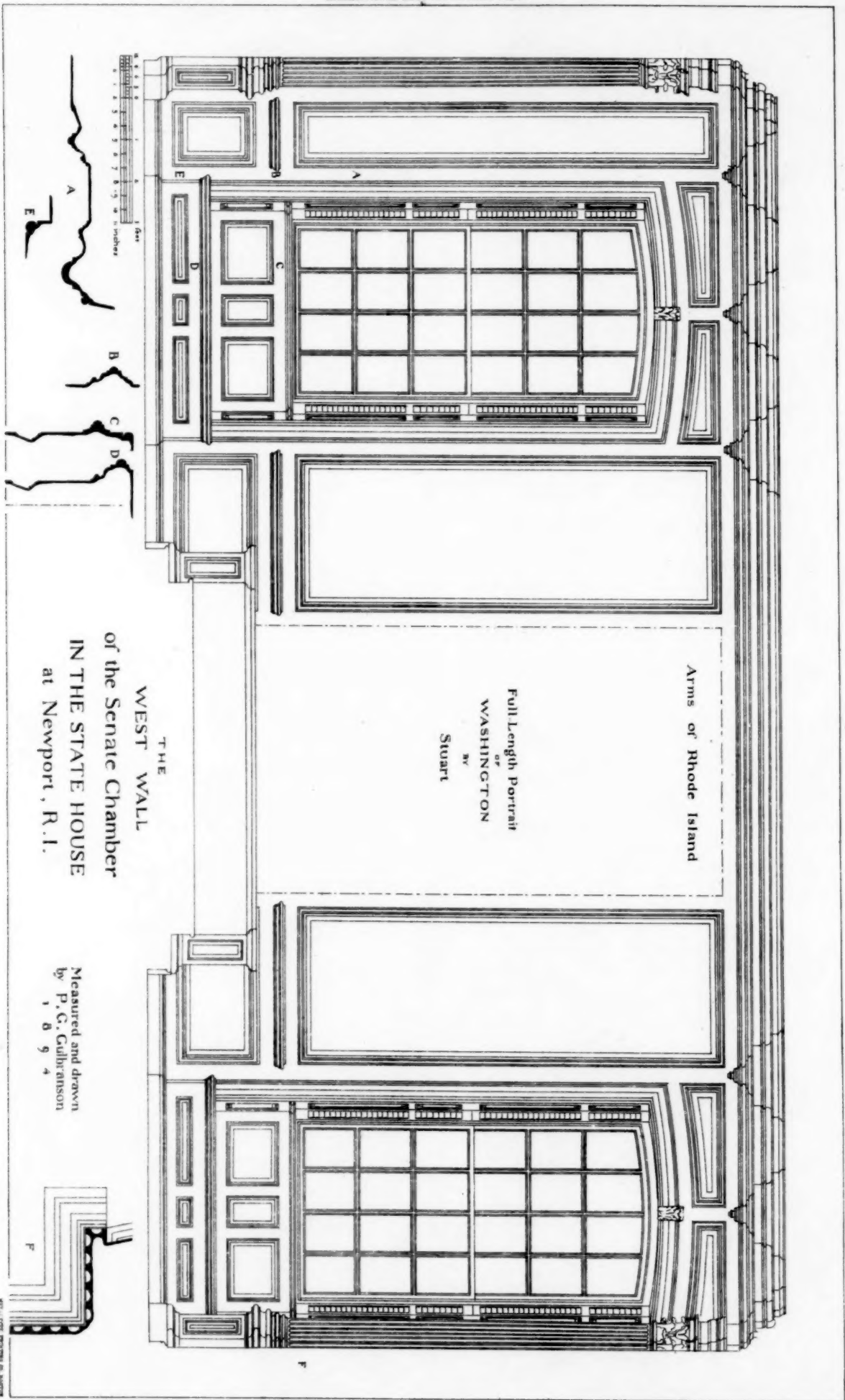
Measured and drawn
by P. G. Culberson
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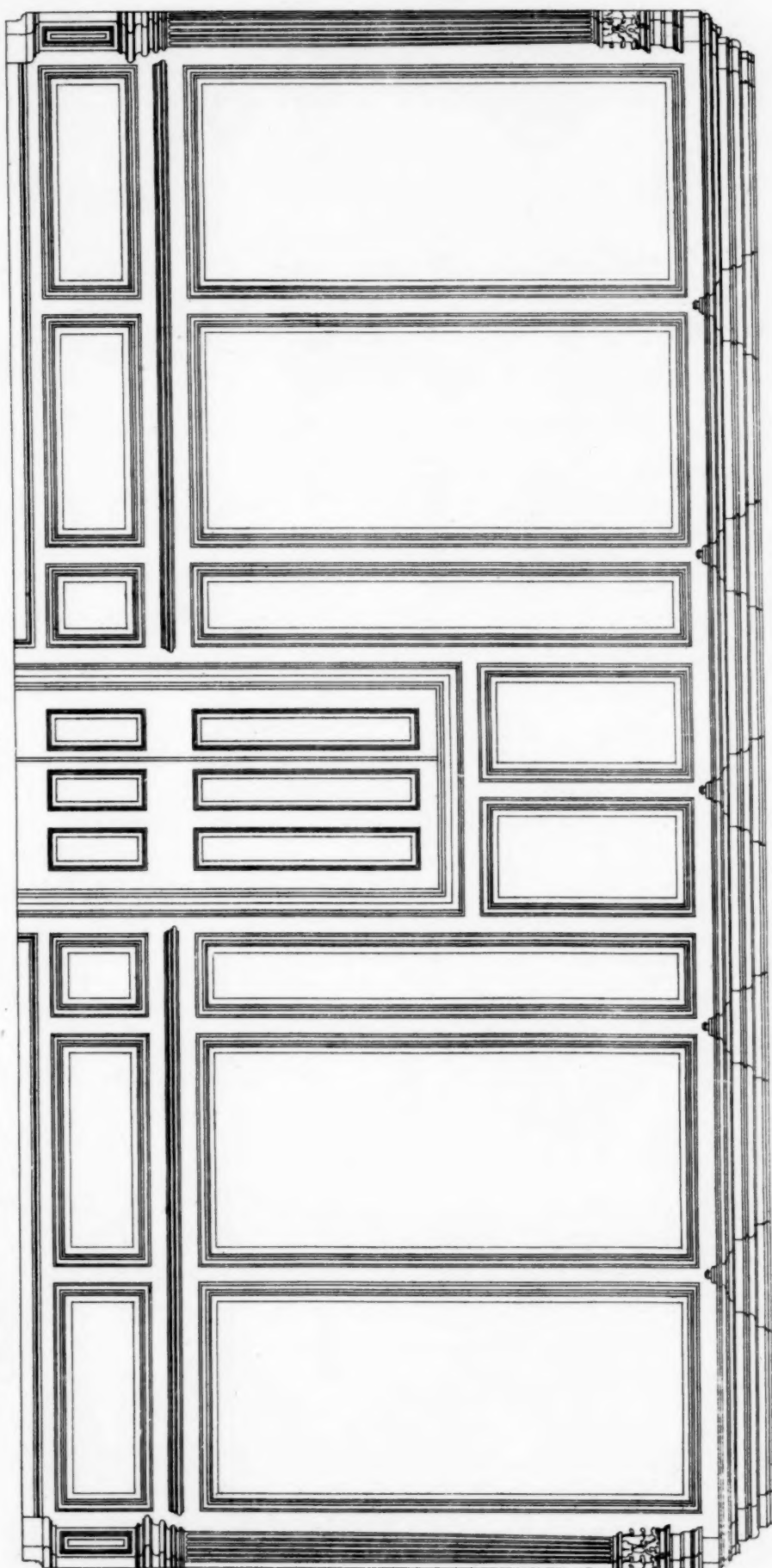
THE NORTH WALL
0 1 2 3 4 5 6 7 8 9 10 feet

The Senate Chamber
IN THE STATE HOUSE
at Newport, R.I.

0 1 2 3 4 5 6 7 8 9 10 feet

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Measured and drawn
by P. G. Culbranson.
1894

THE EAST WALL



The Senate Chamber
IN THE STATE HOUSE
at Newport, R.I.

The basement, the steps giving access on three sides to the ground floor, the quoins and sills are of stone; the other decorations of wood. The walls are of brick.

The building was neglected during the Revolution, but after the war it was restored in accordance with the original designs.

The Representative's Chamber has been materially altered, but the Senate Chamber still remains as originally built. This room is wainscoted from floor to ceiling and on the west wall there is a portrait of Washington by Stuart. (The above notes are taken from "Mason's Reminiscences of Newport.")

A drawing of the pillory has been added as a curiosity; this instrument has found a resting-place on the tie-beams of the roof, and had been long undisturbed, as the accumulation of dust showed when the writer measured it.

THE SENATE CHAMBER: RHODE ISLAND STATE-HOUSE, NEWPORT, R. I. MEASURED AND DRAWN BY MR. P. G. GULBRANSON, ARCHITECT, BOSTON, MASS.: FOUR PLATES.

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

THE PULPIT IN THE OLD MEETING-HOUSE, SANDOWN, N. H. MEASURED AND DRAWN BY MR. J. A. LANE, BOSTON, MASS.

This type of pulpit, with the clerk's desk below, is a very unusual one in this country and seems to mark this building as a piece of true Colonial work, though it has not been possible to fix the date for the structure. The building itself is not large, covered with a simple pitch roof, without tower or steeple.

ENTRANCE DOORWAY AND DETAILS OF THE SAME BUILDING.

THE WEST CHURCH, BOSTON, MASS. MEASURED AND DRAWN BY MR. A. C. FERNALD, BOSTON, MASS.

This building which was until recently a Unitarian Church, is believed to be the work of the well-known early architect Asher Benjamin, at least his name appears in the parish rolls as a member of the society and it is a fair inference to assume that he designed the building. During the last year the interior of the building has been very slightly altered to adapt it for use as a branch of the Boston Public Library, the changes being carefully made under the charge of Messrs. Fox & Jenney, architects.

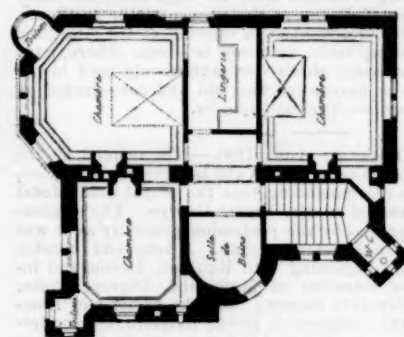
SIDE ELEVATION OF THE SAME BUILDING.

[Additional Illustrations in the International Edition.]

VILLA OF M. HENRI PARENT, ARCHITECT, VAUCRESSON, SEINE-ET-OISE, FRANCE: ENTRANCE FACADE.

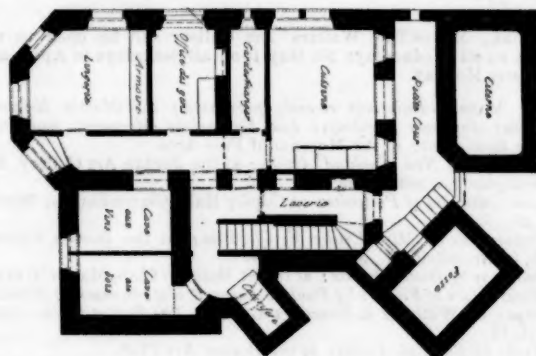
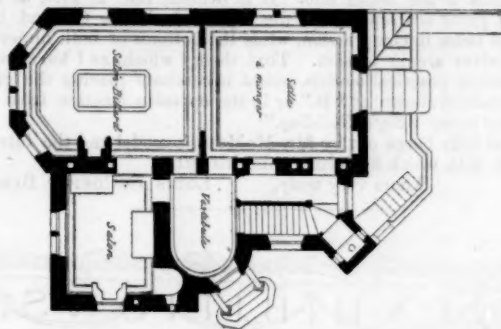
[Copper-plate Photogravure.]

Few things are more really interesting to study than the houses which architects build for themselves. If in each case the architect had abundant means to carry out his ideas, one might expect to find each dwelling an ideal creation and a proper measure of its designer's real force as an artist. Unfortunately, the architect who builds for himself is as much hampered and worried by the niggardliness of his client as if he were working for the veriest stranger. Hence it is, that architects' houses are rather small and convenient snuggeries than real architectural creations. Like other clients, they have to yield to the cogency of figures and the result usually is that an architect's house is the mere whimsical presentation of the designer's pet ideas, much mutilated and restricted by force of circumstances.



It is not often that an architect passes his seventy-fifth year before he builds his own house and, rejoicing in the opportunity of breaking away from the safe path of rule and formula, sets out to indulge his own whims and fancies. Just what direction would be taken by such a venerable practitioner, whose work for decade on decade had run the gamut of the styles of Louis XIV, XV and XVI, no one could safely predict, and the result as shown by the plates and cuts is all the more interesting. Picturesqueness first, and a

proper and health-giving orientation of the rooms seem to have been the guiding motives in the designing of this structure in which the happy designer hopes to spend his declining years, and which in a



spirit of filial piety he has named after his long dead father, "Castel Aubert."

THE STUDIO FACADE OF THE SAME BUILDING.

[Copper-plate Photogravure.]

ANOTHER VIEW OF THE MAIN FACADE.

[Copper-plate Photogravure.]

CONVALESCENT HOME FOR FIFTY BEDS, LLANFAIRFECHAN, NORTH WALES: TWO PLATES. MR. THOMAS BOWER, NANTWICH, CHESHIRE, ARCHITECT.

This building, the cost of which is being wholly defrayed and endowed by Messrs. Robert, Arthur and James Heath, the proprietors of the Biddulph Valley Coal and Iron Works, near Stoke-on-Trent, Staffordshire, is being erected for the benefit of the workmen of North Staffordshire. The site is the Penmaenmawr Road, about a quarter of a mile from Llanfairfechan Railway Station, a beautiful sheltered spot under the range of Penmaenmawr Hills and overlooking the Isle of Anglesea, the Menai Straits and the Irish Sea. The building comprises a three-storied block, containing day-rooms and dormitories for fifty beds and matron's rooms; and advantage has been taken of the quick fall of the ground from south to north to construct a basement floor, containing dining-hall, billiard-room, kitchens, etc. The building will be served and heated by hot water throughout, and lighted by electricity. A laundry and cottage is also being provided. The external walls are of local stone, with Cefn stone dressings and lined with bricks.



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

"NOTCHED AND BUILT BEAMS."

NEW YORK, March 7, 1896.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Mr. O. A. McMeans's letter, referring back to the discussion in regard to the position of notched beams, leads me to repeat what I think was published as the result of the discussion at the time, viz., that the position "A," the one assumed by me, was based on Weisbach's theory, which certainly seems plausible, viz., that the beam acts as a whole, the lower half of beam in tension and the upper half in compression, and consequently the girder should be placed in the position I have shown.

A model made by me (at the time of the discussion) convinced me that, while the theory was apparently all right, its practical application was incorrect, and that the opposite position to that shown in my book is the better one. It is evident that at first, at least, the two parts act separately, the top of both the top and lower halves of beam in compression, while the bottoms of both upper and lower halves are in tension. That theory which, as I have said, is borne out by practical models, would necessitate placing the girder in the position shown at "B," or in the opposite position from that called for in my "Safe Building."

This is fully borne out by Mr. McMeans's model and the interesting table with which he accompanies his letter.

Yours very truly, LOUIS DECOPPET BERG.



BALTIMORE, MD.—The Walters Art Gallery will be open to the public on all Wednesdays till May 1, on all Saturdays in April, and on Easter Monday.

BOSTON, MASS.—Paintings recently purchased; the Martin Brimmer Pictures; Japanese Paintings; Line Engravings, Mezzotints and Etchings by Rembrandt: at the Museum of Fine Arts.

Paintings by New England Artists: at the Jordan Art Gallery, 450 Washington St., until June 1.

Loan Collection of Portraits: at Copley Hall, Clarendon St., March 2 to 23.

Photographs by Miss Emilie V. Clarkson: at the Boston Camera Club, 60 Bromfield St., March 4 to 14.

Paintings by Boston Artists: at the St. Botolph Club, March 10 to 21.

Water-colors of Flowers by Paul de Longpré, also, Bronzes by Edward Kemeys: at Williams & Everett's Gallery, 190 Boylston St., until March 14.

Works by Swedish Artists: at the Boston Art Club.

Drawings by George Du Maurier: at James M. Hart's, 220 Boylston St., until March 21.

BRIDGEPORT, CONN.—Second Annual Exhibition of Pictures: at the Public Library, January 25 to March 15.

CHICAGO, ILL.—Works by Gustave Doré: January 21 to March 21, Annual Exhibition of the Cosmopolitan Club: March 11 to 31, at the Art Institute.

Ninth Annual Exhibition of the Chicago Architectural Club: at the Art Institute, March 27 to April 8.

NEW YORK, N. Y.—Twenty-ninth Semi-annual Exhibition, including Loan Exhibition of Early American Paintings, Old English Paintings, and the Cullum Collection of Classic Sculptures: at the Metropolitan Museum of Art.

Pictures by J. B. Jongkind: at the Durand-Ruel Galleries, 389 Fifth Ave., March 7 to 21.

Pastels and Water-colors by Edwin A. Abbey: at the Avery Galleries, 368 Fifth Ave., March 9 to 21.

Paintings by Arthur B. Davies: at the Macbeth Gallery, 237 Fifth Ave., March 9 to 21.

PROVIDENCE, R. I.—Exhibition of the Providence Art Club: opened March 4.

WASHINGTON, D. C.—The Art Gallery of Thomas E. Waggaman will be open to the public on Thursdays during March and April.



SEWAGE DISPOSAL AT PARIS.—Very extensive sewerage works have been in progress in Paris during the past few years, and will be brought to a conclusion by the year 1899. The governing principle has been in the first place to totally prevent all untreated sewage entering the Seine, and in the second to adopt in its completest development the system of water-carriage, which, as originated in this country some 60 or 70 years ago, raised the ire of German chemists, who complained of the waste of manurial material. At the present moment the discharge from the Paris sewers amounts on the average to 590,000 cubic yards per day, though this value may vary 20 per cent, more or less, without taking account of exceptional storms. For purifying the sewage, irrigation-farms have been laid out, the first of these, that on the peninsula of Gennevilliers, dating from 1869. Progress was then interrupted by the war, but since then the area at this spot treated has been greatly extended, and now amounts to very nearly 2,000 acres. The land treated was originally an arid sandy waste, the value of which is said to have been increased fivefold by the process, being now cultivated as kitchen-gardens. This land, it should be stated, does not belong to the municipality, but to private individuals, to whom the sewage is delivered on demand, the flow to the land being entirely under the control of these proprietors. All sewage not required by them flows direct to the Seine. As an average these lands at Gennevilliers take about 117,000 cubic yards per day, with a minimum of 65,000 in February and a maximum of 170,000 in June; the average corresponds to covering the soil to a depth of about 9-16 inch

every day. The whole of the remaining sewage, amounting to about four-fifths of the total, has up to the present been turned direct into the Seine. As regards frost, it is stated that even during the heavy and long-continued frost of last year, the supply to the land in February did not fall sensibly below the average, although during this period only about one-sixth of the area in question was irrigated at any particular time. The success attained here has been so great that the Paris Municipality determined to extend the system, and acquired powers for treating another 2,000 acres in the peninsula of St. Germain. This work was completed in July last year, and a quantity of sewage amounting to 53 cubic yards per acre per day is thus disposed of, or about 106,000 cubic yards in all. An aqueduct $8\frac{1}{2}$ miles long was constructed specially for this work, its dimensions being fixed with a view to passing in the future nearly double the present total sewage of Paris, it being intended to prolong it to other irrigation-farms farther on. Included in the work is a siphon under the Seine, in constructing which the shield system of tunnelling was employed. This was described in *Engineering*, Vol. lix., page 529. The farm at St. Germain belongs to the city, but is occupied and worked by private parties, who are simply bound to take not less than 19,000 cubic yards per acre per annum. In this way about half the present output of the Paris sewers is satisfactorily provided for, and during the next three years the remainder will be dealt with in a similar fashion. Powers have been acquired for delivering sewage to another 12,356 acres, still farther down the valley of the Seine. The whole of this land will not, of course, be required immediately, but provides ample accommodation for a very large increase in the present sewage discharge of the city.—*Engineering*.

OYSTER-SHELLS AND WESTMINSTER ABBEY.—There is a singular feature in the early mason work of Westminster Abbey, which I have not seen reference to in any history of that famous abbey. When removing or repairing any of the more ancient stonework of the abbey, it is always found that the large stones are set or levelled with oyster-shells. This, I am informed, is peculiar to Westminster Abbey. I have in my possession two or three of those oyster-shells which were found during alteration in the oldest portion of the Abbey. They are very flat and thick, measuring four and a half inches in diameter, and retain the small shell incrustations on the outside. It will be interesting to know whether there is any tradition associated with such an unusual use of the oyster-shell. The story of the Abbey's foundation points to its association with fishermen. The tradition is that Sebect, having determined to build a Christian temple and dedicate it to St. Peter, asked Militus, first Bishop of London, to perform the dedicatory ceremony, but St. Peter himself anticipated him in the performance of it. On the Sunday night, the eve of the intended consecration by the Bishop, a fisherman of the name of Edric was casting his net from the shore of the island in the Thames; on the other side of the river a bright light attracted his notice. He crossed and found a venerable personage in foreign attire calling for some one to ferry him over the dark stream. Edric consented. The stranger landed and proceeded at once to the site of the church. The air suddenly became bright with a celestial splendor, and the church stood out clear and beautiful; a host of angels descended and re-ascended with sweet odors, and flaming candles, and assisted in the dedication of the church in the usual solemnities. The fisherman was so awestruck by the sight that when the mysterious visitant returned and asked for food he was obliged to reply that he had not caught a single fish. Then the stranger gave him his name: "I am Peter of the Keys of Heaven. When Militus arrives to-morrow, tell him what you have seen, and show him the token that I, St. Peter, have consecrated my own church of St. Peter's, Westminster. For yourself, go out into the river; you will catch a plentiful supply of fish, whereof the larger part shall be salmon. This I grant on two conditions: first, that you never fish on Sundays; secondly, that you pay a tithe of them to the Abbey of Westminster." The legend was fully endorsed by King Edward the Confessor, who rebuilt the Abbey, and recited in his new charter the miraculous consecration by St. Peter. And this dedication by St. Peter, the patron saint of fishermen, led to the offering of salmon upon the high altar, the donor of which had the privilege of sitting at the convent table to dinner. Whether the oyster was also presented as an offering at the altar, and afterward used at the refectory table, tradition is silent. There, however, remains the fact that oyster-shells were extensively used in the building of the Abbey whose foundation was laid and consecrated by the patron saint of fishermen.—*Notes and Queries*.

THE ROYAL GOLD MEDALLIST FOR 1896.—The council of the Royal Institute of British Architects have, it will be generally conceded, made a felicitous choice in recommending that the Royal Gold Medal for the current year be awarded to Mr. Ernest George. The nomination will be as heartily approved by the profession generally as it was received when announced on Monday evening. A long and notable series of domestic buildings, beginning with Rousdon, Devon, and including in the country the mansions of Motcombe, Dorset; Poles, Herts; Woolpits and Dunley Hill, Surrey; Shipplake Court and Rosehill, on the Upper Thames; Beechwood, Kent; Batsford, Gloucestershire; and Buchan Hill, Sussex; and in London houses in Grosvenor Place, Cadogan and Berkeley Squares, Collingham and Harrington Gardens testify to Mr. George's skill as a house-planner, as well as to his dexterity in picturesque grouping and his fresh detail, while, as the exhibitions show, he is equally facile and vigorous as a sketcher with pen, pencil, etching-needle or sepia and water-color brush. His confrères in the profession so persistently treat Mr. George as a young and rising man with a promising future before him, that it is difficult to realize that he is in his fifty-seventh year, yet a generation has passed away since on the completion of his articles with the late Samuel Hewitt, of the Adelphi, he entered into partnership with Thos. Vaughan, also long since deceased. A portrait of the gold medallist nominate was published in our issue of January 3, 1890, and most of his more important works have been illustrated in our pages.—*The Building News*.