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THE decision of the Committee of Award in the School-House Competition of the *Sanitary Engineer* is made known. As we said a fortnight ago, nearly two hundred designs were received, coming from all parts of the United States. The plans were marked by the members of the committee on a scale of four hundred, one hundred marks being allowed for convenience of arrangement, one hundred for security against fire and facility of egress, one hundred for lighting, fifty for heating and ventilation, and fifty for sanitary appointments. The four premiums were given in order to Messrs. Arthur T. Mathews, of Oakland, Cal., Samuel J. F. Thayer, of Boston, H. C. Koch, of Milwaukee, and R. E. Kennedy, of Philadelphia. The six other plans selected for mention were those of Messrs. H. E. Siter, of Boston, F. C. Merry, of New York, Frederick Baumann, of Chicago, W. P. Wentworth, of Boston, Clarence Sumner Luce, of Boston, and J. Appleton Wilson, of Baltimore. These awards were made with no reference to the architectural merit of the designs; but the Committee make honorable mention, independently of the award, of the architecture of the designs marked Square (Mr. Mathews's), Pestalozzi, Tom Pinch, Fiat Lux (Mr. Kennedy's), Philadelphus, Try (Mr. Siter's), Pro Bono Publico (Mr. Wilson's), Multum in Parvo, Docendo Dicimus, and Qui Tam (Mr. Luce's).

THE terms of the competition were arranged, it will be remembered, to suit the kind of lot which is usually assigned to school-houses in New York city. It is not surprising, therefore, to find the Committee of Award declaring that none of the plans submitted fulfil the requirements of a sanitary school building; and adding that "the conditions imposed on the competitors were of such a character that it is probably impossible to produce a plan which should be recommended as one to be constructed." In other words, the final lesson of this competition is, like that of the previous one, that the thing which is customarily attempted cannot be successfully done under the most favorable circumstances. The tenement-house experiment showed that a proper tenement-house cannot be built on the ordinary New York lot, under the ordinary requirement of four families to a floor. The school-house experiment shows, as we argued when it was first announced, that proper accommodation cannot be provided for eight hundred school-children on a lot one hundred feet square, enclosed on three sides. And the Committee is discreetly careful in recommending the selected design "only as the best plan for a school building to be built in a huge box, lacking one side and without a top, the sides of which box are about sixty feet high, which seem to be the only conditions under which school buildings have been erected in New York, and in which from fifteen hundred to twenty-five hundred children have been crowded." We may join in their hope that the experiment and the public attention it has attracted may tend to some legislation "enforcing a change in the present methods of selecting school sites and of erecting school buildings."

CONSIDERING that the regulation of architectural competitions has been the great problem of our profession for a generation, it is significant of uncommon difficulties that it is no further ahead now than at the beginning of the generation. But all the while the habit of competition has been gaining ground, till now its machinery is habitually called in for work for which it is altogether unnecessary. In England, both the Institute and the Architectural Association have occupied themselves anew with it of late. A short time ago, in a paper read before the Institute, Mr. Thomas Porter, Fellow, gave some very impressive statistics, which he had collected, of the number and enormous cost of open competitions held in England during a year or two past, and made an earnest appeal for some agreement on the part of members of the Institute to refrain from open or unregulated competitions. Mr. Porter had examined and tabulated the records of a great number of open competitions advertised in the English building papers, a thing which nobody has ever taken the pains to do before, we fancy. He finds that the average number per year noticed in the *Builder* during the last twenty-three years is about fifty. By an analysis of one hundred and seventeen advertised within two years and a half he finds that the average number of competitors is twenty-three, and, assuming from his own experience in competitions that the average number of drawings furnished with each design is eight, he computes 11,648 drawings furnished during each year, at an estimated cost of 23,296 pounds sterling. This he considers a low estimate, and taking into account that there are many competitions which do not appear in the record, and that the amount returned to the architects in the form of premiums is trifling, he concludes that he is within the mark in saying that the average uncompensated cost of these competitions to the profession is £500, or the aggregate in a year throughout England £25,000, — say \$125,000, — making no allowance for the time and labor of the architects themselves who offer them, and that the whole sum wasted on them by English architects in twenty-three years since the great competition for the Government Offices in 1857, of which we not long ago quoted Sir Gilbert Scott's account, is not less than half a million sterling; these estimates being not of the actual value of the drawings, but of the mere cost of preparing them.

THE discussions which followed Mr. Porter's paper, and that read by Mr. Walker, also a Fellow of the Institute, a week later, before the Architectural Association, showed very distinctly what indeed was well enough known before, and what is the real occasion of the whole difficulty, — that the profession is by no means agreed as to competitions. Many members, like Mr. Porter, were in favor of discouraging all competitions as much as possible; others accepted them as a necessary evil, to be controlled as far as might be; and some, speaking well of the bridge that had carried themselves over, regarded them as the young architect's only access to the successes of his profession. The general drift of opinion might have been anticipated, — that whether competitions are desirable or not they are demanded alike by the public and by architects, and therefore will exist; and this being the case, that the only thing that can be done is to abate their evils by every practicable means, the favorite amelioration seeming to be the appointment of professional judges. The most original contribution was that of Sir Edmund Beckett. The system of competitions, thought Sir Edmund, was simply the architects' system of advertising, — the counterpart of what exists in other kinds of business, — and if it costs them money that was only natural. As for making regulations, he would have none of them, and if he were a member of the Institute he would not obey them if they were made. An appeal to architects to hold themselves in restraint on the ground of sentiment or dignity simply meant the sentiment of the breeches pocket. Architects seemed fond of calling themselves artists, but so were singers and cooks, and if he were an architect he should not call himself an artist. (It may be added that when Sir Edmund has tried to be an architect nobody else has been tempted to call him an artist.) Artists, nevertheless, were as much given to competition as anybody else. In fact, competition was the soul of trade, as monopoly was plunder. The Institute, having got Sir Edmund as a member, probably felt obliged to listen to his opinion, and if experience goes for anything it had abundant reason to know that good manners were not to be expected from him; but that an eminent barrister should fail to recognize a difference be-

tween competition and competitions was perhaps beyond calculation.

As to the objections to competitions other than their cost, they have been often stated essentially as they were stated by Mr. Porter; but he laid stress on one evil tendency which is commonly overlooked,—their tendency to a hurtful influence on the habits of the men who make the designs and on the draughtsmen who execute them. They not only encourage architects, he argued, to design on imperfect knowledge of the conditions of their work, and to put into the designs things that will make an immediate impression on the inexperienced examiner, with little effort at a thorough working out of the problem set, but they raise up an army of draughtsmen whose business it is to make things look well on paper, but who know and care little about constructive requirements or adaptation to practical needs,—dress-soldiers who appear well on parade, but who are of little value for real service. The prevalence of competitions and the habit of making show-drawings for them in England make this class of draughtsmen more numerous there than they are in this country. "What has been the history," asks Mr. Porter, "of the men who have engaged in the preparation of the two hundred and sixty-seven thousand waste drawings made in competitions since the time of the Government Offices in 1857? Their history is written in many cases in blighted hopes and ruined prospects." Their work leads to nothing; they do not become architects; their career is unsatisfactory and precarious, and the effect of their work on the profession is demoralizing rather than anything else.

THE mechanical industries of the country struggle against a sea of troubles. The return of an appearance of prosperity is the signal for a general demand among workmen for higher wages and for an outbreak of strikes. Twelve hundred cabinet-makers are on strike in New York, it is said, chiefly from Herrman's furniture factory and Steinway's piano factory. A large number from the same trade are out in Cincinnati. The United Order of American Carpenters in New York is preparing to demand an increase of fifty cents a day in wages, and it is expected that the hands in other building trades will do the same. A like movement is on foot in Cincinnati, where a meeting of journeymen carpenters has resolved to form a union, and given notice to their employers of a demand for an increase of twenty-five per cent after April 1. In Cohoes, N. Y., four thousand mill hands are on strike. There are lesser strikes, of various importance, in other towns, and the hands in the mills at Fall River and North Adams are calling for an increase of fifteen per cent, some of those in North Adams giving force to their demand by striking, though thus far without effect. In Troy some strikers among the metal-workers have gone so far as to offer violence to their employers; others have tried the plan of intimidating their fellows; but in most places things have not got to the condition that invites extreme measures. As yet the battle does not incline to the workmen; but these are only symptoms of what is likely to be a pretty general movement in all trades, at least unless the workmen fail signally in the first attempts. A rise in wages in the building trades may naturally be expected, since it is a regular phenomenon of the spring, when the building season begins. Manufacturers, we fancy, are hardly yet sure enough of their profit to be ready to yield to their men if they can hold their own. The piano manufacturers of New York, indeed, have pledged themselves to a general lockout after the 15th of this month, in case the men from Steinway's factory do not return to their work before that time. Mr. Herrman, on the other hand, having, as he says, lost much money by keeping his men at work during the dull season, proposes, in case they persist, to close his factories altogether.

THE last report of the Massachusetts Bureau of Labor and Statistics records the experience of a large number of strikers in that State, and reads a lesson which might be profitable to workmen, if they would learn it. It counts one hundred and fifty-nine strikes, of which one hundred and nine failed altogether, sixteen were compromised, and only eighteen actually succeeded. The cost and indirect evils of strikes are strongly insisted on. The most disastrous were those at Fall River last year. The actual loss in wages to the strikers was near a million and a half of dollars, and there was absolutely nothing to show for it: the report computes that even if, at the end of the fifteen idle weeks, the strikers had gained the fifteen per cent advance for which

they struck, it would have taken them two years to make up their losses. The report further shows that if the hands had put into a coöperative venture the capital which they sunk in the strike, they might have built with it a mill of twenty-five thousand spindles, and furnished it with machinery and working capital. We confess we very much fear that in the end the hands would have sunk their capital all the same, but the mill would have remained as so much added wealth to the community, and they themselves might at least have got more instruction from it than from a fruitless struggle. The conclusion of the report is that the strikes have been ineffectual in regulating the price of labor, except through the indirect process of shortening the day's work. It is also recorded that the most of the strikes and troubles were set on foot by foreign operatives; that of these the most factious and unreasonable were the British workmen, and that our trades-unions and our agitators have been imported from England.

In San Francisco the workingmen, excited by their quarrel over the Chinese, seem to be bringing the labor question nearer to its ultimate conclusions than anywhere else. The new constitution, adopted last year through the efforts of the workingmen, and discriminating against the employment of Chinese labor, gives them a handle by which to stir up trouble. Continual agitation of the question having had its natural effect in discouraging business and driving capital out of employment, the men find themselves worse off than before, and the unemployed more numerous. This inconvenience, like the rest, is visited on the unlucky Chinese. The sand-lot speeches have lately been fuller than ever of threats of violence. A committee of the unemployed has visited the principal corporations which employ Chinese labor to remind them that the new laws forbid corporations which are chartered by the State from giving employment to any Chinese, and enforcing their appeal by the hint that "the welfare and safety of our city" require compliance with it. Doubtless the laws which prohibit the employment of the Chinese violate the provisions of the Burlingame treaty, which guarantees the Chinese against discriminations, and so conflict with the Federal law. Some employers have declared themselves ready to defy the laws and test their constitutionality in the courts, which has drawn from Kearney and his followers an emphatic declaration that they will not accept the decision of any courts against them, and that the Chinese must go.

THERE is without doubt much hardship among the working classes of the city, as there must needs be wherever their ungoverned turbulence interrupts the course of industry; and the movement to secure charitable aid for them naturally fails in the face of their violent action. It is said, however, that a committee of the Chamber of Commerce has decided, more perhaps as a measure of precaution than as a charity, to raise funds to employ several hundred men on some public work at a dollar a day. The repeated threats to burn the Chinese quarter, and the denunciation of those who employ its inhabitants, have stirred up much uneasiness. A large increase of the police is only a natural precaution, but one curiously offensive to the mayor, elected by the workingmen, who, while counselling his party to moderation and obedience to law, does not scruple to add, "If I thought labor would forever be given to Chinese dogs I should advise you otherwise." The Board of Health, meanwhile, has been inspired to propose an ingenious solution of the difficulty by sending a committee to inspect the Chinese quarter, and, on learning their report, by declaring the quarter a nuisance which ought to be abated. Perhaps this is true; but if we were to act on this principle wherever it applied equally well we should have a large quarter to demolish in every considerable city in the world. The effect of all this disquiet is naturally most disastrous to San Francisco, and though the appeal of the Chinese companies to the Government for protection, the threatened employment of troops to preserve order, and the revival of the traditions of the "vigilance committees" seem for the moment to have awed the leaders of disturbance into comparative quiet, the air is full of anxiety and the possibility of danger. The workingmen of San Francisco have an opportunity to push their doctrines to their last result which is lacking elsewhere. If a *reductio ad absurdum* must be tried and the battle be fought to extremity, the people of the rest of the country may hope that the remoteness of the strife and the result of it will save them from being invaded by it.

THE POROSITY OF BUILDING MATERIALS.¹

LANGE gives, by calculation from such experiments,² the pressure on the outer walls of a house 20 meters high, at a barometric pressure of 718 millimeters, the inside temperature being 27.3° C. and the outside temperature 0° C., 1.114 kilograms per square meter of the exposed surface. The amount of ventilation resulting from this pressure depends upon the nature of the building materials used, and may be easily calculated when the latter is known.

As for the second consideration, the diffusive power of gases, its influence upon the ventilation of a house through the outer walls is, owing to the small difference in the mechanical mixtures of the air within and without, and to the consequent diminutive pressure against the walls either way, too small to be appreciable, and it may therefore be ignored.

By far the most important agent in natural ventilation is the wind.

The following table, calculated from Peclet and Smeaton,³ shows the pressure of a direct wind per square meter.

Velocity in Meters per second.	Velocity in Kilometers per Hour.	Remarks.	Pressure in Kilograms per Square Meter.
0.5	1.8	Breeze hardly felt.	.03
1.	3.6	Breeze sensible.	.12
2.	7.2	Moderate or pleasant wind.	.48
5.5	19.8	Quite strong wind.	4.5
10.	36.	High wind.	20.
21.	72.	Very high wind.	56.
22.5	81.	Storm.	73.
27.	97.2	Severe storm.	105.
36.	129.6	Hurricane.	186.
45.	162.0	Hurricane which uproots trees and overthrows houses.	290.

For an average velocity of the wind of 27 kilometers an hour we should have a pressure of one half kilogram per square meter. A wind stronger than 36 kilometers an hour would be exceptional, and is not to be reckoned upon. This would give us, according to the table, 22 kilograms per square meter. But in all cases it is necessary for the wind to strike the surface at right angles in order to exert upon it a pressure corresponding to that shown in the table. In consideration of the great variety of force and direction of the wind, it cannot be counted upon as a reliable source of ventilation, our table showing a pressure varying all the way from 0.03 kilograms to 290 kilograms per square meter.

It remains now to ascertain the effect of this pressure in transmitting air through the walls of our buildings. The air may be forced through the wall in two ways, namely, either through the accidental cracks at joints, or through the pores of the materials themselves.

No arguments are needed to show that the ventilation coming from the former is so uncertain in its amount and so disagreeable and dangerous in its character, that every precaution should be taken to reduce it to a minimum. By the use of good cements, packing, and rubber mouldings, it may be reduced to so minute an amount as to be practically inappreciable.

Porous building materials have the advantage of greater capacity for warmth. The conductivity decreases as the porosity increases, and what air passes through the walls of a building is warmed in its passage. But inasmuch as the loss of heat in radiation from the outer walls into space is the same for an equal difference of temperature between these walls and the objects receiving the rays, such a transmission of cold air through them must cool them to an extent nearly corresponding to its amount, and deprive them largely of their healthful action in radiating heat upon the bodies of the occupants. The greatest desideratum in heating is to have the walls and floor of a room as warm as possible, leaving the breathing air comparatively cool; and anything tending to destroy this effect should be avoided as far as possible.

Experiments have been made by Pettenkofer, Schultze, Märcker, Lange, and others on various buildings, to determine the quantity of air passing through the walls in a given time, under a given pressure. Pettenkofer found that the amount of air which passed through the walls of his study, per hour, was 0.245 cubic meters per square meter of wall-surface for a difference of 1° C. between the external and the internal temperatures. But these experiments give no reliable or accurate data for practice. The only way to obtain correct results is to make the tests on a simple scale with small pieces of material under a known pressure.

The principal building materials used in different countries differ greatly in their permeability to air. In Germany they appear to be in general more porous than in this country, so that, perhaps, for this reason the need of artificial ventilation is less directly felt with the Germans than with us.

Of all building materials none differs more widely in the matter of porosity than baked clay or terra-cotta, the material most extensively used. In the form of certain kinds of fire-brick its porosity resembles almost that of a sponge, while in the form of vitrified or glazed tile it is absolutely non-porous. A piece of semi-vitrified terra-cotta, used in a furnace constructed by the writer, was tested by him, and found to permit only 9 cubic centimeters of air to pass through per hour, under a pressure of 10 centimeters of a water column which is equivalent to a pressure of 10 grams per square centimeter. The piece was 30 millimeters thick, and presented a surface of 35 square centimeters to the pressure. For a surface of 1 square meter the amount of air forced through would have been 2.6 liters per hour, under the same pressure of 10 grams per square centimeter.

Other pieces, in the form of brick, were tested by Dr. Henry P. Bowditch, with the following results:—

Four Taunton bricks allowed the air to pass at the rate of about 62, 160, 106, and 795 liters respectively, per hour, for the same surface (1 square meter), same thickness (3 centimeters), and same pressure (10 grams per square centimeter). North Bridgewater bricks gave 66 and 132 liters; a New York brick, 330 liters; New Jersey bricks 24 and 53 liters; a Philadelphia face brick 891 liters; a hard Eastern brick, 165 liters; and a Danvers face brick, 231 liters. Ohio sandstone gave 990 liters.

The apparatus used for our tests is represented in Fig. 145. Air was

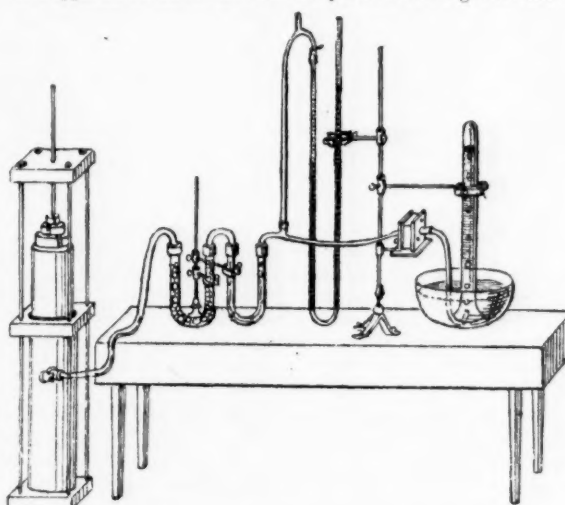


Fig 145.

compressed in a gas-holder shown at the left of the table and conducted by a rubber tube to two bent glass tubes containing, the one chloride of calcium and the other sulphuric acid, in passing through which it was thoroughly dried. The pressure was measured by a water manometer, and the piece of material to be tested was held between two cups of iron securely connected with the rubber tube in such a way that the compressed air could enter freely one exposed side of the sample and escape at the opposite side. The four remaining sides were covered with an air-proof cement composed of wax and rosin to prevent the escape of air at any other points than that covered by the cup and tube opposite the one delivering the fresh air, and the whole was kept under water during the test, so that any escape of air might at once be detected by bubbles. The air thus pressed through the material to be tested was finally delivered into a graduated glass vessel inverted over a basin of water, and measured. The same apparatus was used for testing the soapstone before referred to.

The apparatus used by Lange in making his more extended tests in Germany was similar to that above described, except that he measured the volume of air before instead of after passing it through the material to be tested. This method was less exact because some of the air measured might not be actually transmitted through the material, owing to leakage.

The observations of Schürmann⁴ and Lange show that the amount of air passing through porous materials of homogeneous structure under constant pressure is inversely proportional to the thickness of the pieces tested.

Lange gives the following table showing the permeability of various materials under a constant pressure of 10 grams per square centimeter, and the amount of air in liters or cubic decimeters passing through them per hour, per square meter of surface, the pieces tested being 30 millimeters thick.

According to Lange and Märcker, burning increases the porosity of brick up to the point of vitrification, when it becomes non-porous. The different kinds of bricks vary greatly in porosity. Mortar is exceedingly porous, but after remaining some time immersed in water it becomes less so. We see by the table that Portland cement transmits 492 liters per square meter, under the slight pressure of 10 grams to the square centimeter, or about the hundredth part of

¹ This paper by the writer of the Open Fire-Place articles will be incorporated with those articles in their separate form.

² See page 80.

³ Fortschritte der Physik.

⁴ Jahresbericht der chem. Centralstelle für öffentliche Gesundheitspflege in Dresden.

one atmospheric pressure. It cannot, therefore, as in the form of concrete for basement cellars, be considered by any means as air or damp proof.

Materials Tested.	Amount trans- mitted in Li- ters.	Its Permeability is represented by
Green sandstone (Bavarian).....	468	0.130
" " (Swiss).....	426	0.118
Limestone (calcareous tufa).....	28,728	7.980
ARTIFICIAL STONES.		
Brick, sandal brick of Opnabruck.....	1,398	0.383
" lightly burnt hand made (Munich).....	312	0.087
" hard burnt " ".....	732	0.203
" machine-made, " ".....	474	0.132
CEMENTS.		
Mortar.....	3,264	0.907
Beton.....	930	0.258
Portland cement.....	492	0.137
Plaster (gyps.) cast.....	146	0.041
WOODS.		
Oak.....	24	0.007
Pine.....	3,636	1.010

The different woods vary greatly, pine being more porous even than mortar, and oak less porous than the densest brick. Tufaceous limestone was found to be the most porous substance tested.

The different kinds of bricks and sandstones vary greatly. Ten different kinds of sandstone given by Lange varied between 0.3661 and 0.009 cubic meters of air transmitted under the same pressure in the same time, the French sandstone tested transmitting 40 times as much air as the German (Sollingsandstein), which was the least porous.

Lange found that a coat of water-glass (silicate of soda or potash) diminished the porosity, and the more so the longer it stood, until after a certain time it rendered it entirely non-porous. Oil paint acted in the same way as long as it was new. Water-color with glue size (Leim farbe) diminished greatly the permeability, more than half, and the more the stronger the sizing. Lime water-color (Kalk farbe) diminished it the least. Papering diminished the porosity more or less according to the nature of the paper and the thickness of the paste used in hanging it. The diminution of the permeability varied for different tests between 18 and 75 per cent.

Dampness, due to rain on brickwork, etc., diminished the permeability according to the degree of the moistening, in some cases rendering a porous material absolutely non-porous, as in the case of Beton and Portland cement.

Knowing, then, the permeability of our building materials and the pressure of the wind, it is easy to calculate the natural ventilation in any given case. Suppose, for instance, we have a room 6 meters square and 4 meters high, with one exposed side, and that the exposed side contains a window 1 meter wide and 2 meters high. The walls are 40 centimeters thick, 30 of which are brick, 4 air-space, 3 lath, and 3 plaster, and present a surface of 24 square meters to the outer air. Take out 2 meters for glass surface, because glass is non-permeable, and we have 22 square meters of brickwork exposed. We have found that 1 square meter of hard Eastern brick 3 centimeters thick will admit 165 liters of air under a pressure of 10 grams per square centimeter. We have, by our table, for plaster 146 and for laths 3,636. But supposing their permeability and that of the mortar to be the same with the brick, we have, for over 40 centimeters thickness of wall, $\frac{165 \times 2 \times 22}{40} = 250$ liters of air transmitted under the pressure of ten grams per square centimeter, or 100 kilograms per square meter.

This pressure is, by the table, equivalent to that of a severe storm bearing directly upon the house.

For a moderate wind the pressure would be about 250 times less, and we should have a ventilation of only one liter per hour. For a Philadelphia face-brick wall we should have about 5 liters per hour, up to 500 liters, or half a cubic meter, in case of a severe storm. For a gentle breeze, direct, it would be about 2 liters per hour, and at right angles with the wall, say, 1 liter again per hour. If the wall were papered on the inside or painted in distemper, these figures would be reduced, say, one half, and if oil paint were used the ventilation would be reduced to nothing.

Where the walls are built of the limestone given in Lange's table as transmitting 28,728 liters per hour, the ventilation in a high wind would amount to $\frac{28,728 \times 2 \times 22}{40} = 47,388$ liters = 47.4 cubic meters per hour, or 0.8 cubic meters per minute, an amount quite sufficient for a single occupant. Thus we see that the ventilation, left to the natural permeability of the material, would vary with every material and with every change of the wind, being greatest when the wind was highest and the exterior air was coldest, or in other words, when least desired. It is therefore in the highest degree unreliable. Such a form of air supply is objectionable, too, in most cases, on account of its cooling action upon the surrounding walls. We have seen that (calculating from Lange's figures) a building material may admit air enough to supply one person for

every 22 square meters of wall-surface exposed directly to the wind.

The matter assumes, then, considerable importance, and demands of the heating and ventilating engineer careful study. Indeed, it is easy to obtain bricks and stones so porous that a candle may be blown out by a slight effort of the breath through pieces many centimeters in thickness. The experiment may easily be performed by any one by attaching rubber tubes to opposite sides of the sample to be tested, and covering the remaining sides with wax in the manner described.

While, therefore, it may for many reasons be desirable to employ porous materials for building, these materials should be carefully coated with non-permeable substances, either outside or inside, or both, and every precaution possible should be taken to prevent the entrance through them of the outer air, though I am aware that this conclusion is exactly the reverse of that held by Lange and others.

If there were cases where no other sufficient fresh air supply could be obtained than through the pores of the building materials, natural ventilation might be recommended. As it is, there are, unfortunately, many buildings in which no other sufficient supply is provided, and natural ventilation then becomes, in spite of us, a great good; but as our question here is with well, and not ill ventilated buildings, accuracy and success in our arrangements requires us to know its greatest extent and provide against it.

ARCHITECTURE AND UTILITY.

[From the late Professor Barry's Lectures at the Royal Academy.]

The connection between architecture and utility, having always existed, gives a practical answer to the doubts which are sometimes felt as to its influence in the future. Rightly considered, such a connection is natural, and to be cherished. Take the question of imitation; we know there is always some fashion in art in these days, which have no style of their own. Public taste may one day turn to Greece, at another to Rome. It may declare the supremacy of Gothic, or discover the merits of "Queen Anne." Now, if we are convinced that architecture must be based upon utility, any direct imitation of ancient models will be recognized as unreasonable and inartistic. We do not want, for example, our Christian churches to resemble heathen temples, however well copied from beautiful designs. The charms of these flowers of art do not bear transplanting, and by thus losing appropriateness they become "matter in the wrong place," and therefore incapable of giving pleasure. We must, no doubt, base our work on the traditions of the past, but the actual copying of existing buildings is not art, but archaeology. The use for which a building is required must affect its architectural forms, or these will fail to satisfy and charm us.

Architecture, therefore, recognizes utility as the basis of her work, on which she erects a superstructure of her own, with grace of proportion and beauty of ornament. Without such additions utility alone would give us not architecture, but only building.

The greatest works of the present generation, those of scientific engineering, are of the latter class. In them, the actual necessities of construction have alone been recognized, with the results that may be seen, for example, on the Surrey side of London Bridge, where one of the finest old churches we possess is hemmed in by iron structures of surprising ugliness. If the conviction, which I endeavored to explain to you in my last lecture, were duly recognized, namely, that architecture is a matter of public interest, any such disfigurement of our public places would not be permitted, and while the argument of utility must always have great weight, it would be carefully scanned, and not be permitted, as a matter of course, to override all other considerations. If, for example, it be conceded that to bring a railway into the centre of a town is a public gain, it does not follow that those who undertake such a useful work have any right to deface the thoroughfares, and destroy the beauty of surrounding architectural monuments. Still less does it follow that ugliness of design is necessary, or that the required utility could not be obtained without artistic disfigurement and loss.

If only people really cared for these things, a way would soon be found to reconcile apparently discordant claims; but this will not be done as long as apathetic legislation gives powers to railway companies to do as they please, after which it is useless for us to fill the air with outcries at the natural result.

To combine art with science in utilitarian structures must, however, be a task of difficulty with the architect and the engineer, for one of our greatest perplexities will always be that of cost. If the utilitarian purpose can be served by a small expenditure, while a more artistic structure will cost a relatively enormous amount, it must be evident that the latter rests under a heavy disadvantage, in pleading its cause.

You will often be told that it is as easy to make a good design inexpensive as costly, but such doctrine is open to many exceptions. The use of iron-work, instead of masonry, for example, is a case in point. No one would like to see the iron roofs of our railway stations adopted as architectural precedents, and we had recently, in the case of London Bridge, an illustration of the difficulty to which I have alluded.

Here, it was stated that the bridge was so thronged that an additional width was required as a matter of urgency for the public con-

venience. A plan was propounded for giving such extra width by iron arches, added, one on each side of the existing structure of masonry. The cost of such additions, it was said, would be small; whereas, to widen the bridge with masonry in the obviously more suitable manner, in an architectural sense, would be so costly, and fraught with such danger to the existing structure, that an improvement urgently demanded by public wants could not be obtained at all if a masonry design were insisted on. Here, then, there was a direct conflict between utility and art. The existing bridge is one of the best specimens of bridge-architecture in the world; but if it were found to be inadequate to the public needs, what claim could it, as a utilitarian structure, advance for exact preservation? If, moreover, it were definitely proved that masonry additions could not be made without imperilling the present foundations and superstructure, and that it must either be widened by iron or not at all, it would be a great responsibility for artists to assume, if it were to be declared that the thousands and hundreds of thousands who use the bridge daily must be forever inconvenienced by a thoroughfare too narrow for the traffic of a great commercial city.

Fortunately this dilemma was avoided, as the practical necessity of the case was held not to have been proved to the satisfaction of Parliament.

A well-designed bridge is, perhaps, as good an illustration as can be found of architecture as a useful art. Some of you, no doubt, know how picturesque an object such a structure became in the hands of mediæval architects; as, for example, at Prague, where the old forms of arches and parapets, with the towers and archways of access, still remain.

Old London Bridge, again, is known to many of us, from pictures and engravings, and must have been a highly-interesting subject to the artist. The Ponte Vecchio at Florence is another instance of the same kind, and, like Old London Bridge, was lined with shops. London Bridge was, indeed, not only a means of communication between different parts of the same great city, as with us, but it also formed in olden times the gate or entrance to the City of London. Some of the houses upon it were of considerable architectural pretension, with passage-ways through them for the public. A chapel was, in accordance with custom, a portion of the bridge buildings, so that the passer-by might have the opportunity of praying for the success of a journey about to be commenced, or of giving thanks for his safe return on its completion.

Looking to the interest, both architectural and historical, which concentrated itself in Old London Bridge, its removal in favor of the present structure must have caused many a regret, and might have been expected to excite to frenzy any society for the preservation of ancient monuments, if such a fraternity had then existed. The time came, nevertheless, when Old London Bridge, with all its picturesqueness, had to be surrendered, because it did not comply with the principle of combination of utility with art. The old bridge-builders had done their utmost, and had constructed such piers and arches as were then considered the best possible; but with increased scientific knowledge these had become intolerable, and an obstructed waterway could no longer be permitted. New London Bridge thus arose from utilitarian considerations, and was, in like manner with its predecessor, an example of the constructive art of its day.

Now that science would appear to have adopted iron or steel as the bridge-building material of the time, it is probable that the days of stone bridge-building are over, and that an engineer, if entrusted now with the erection of another new London Bridge, would propose an iron structure. However much we may regret such a conclusion, it appears to be inevitable, as the primary purpose of a bridge is utility.

Assuming, therefore, that in the future the forms of our utilitarian architecture must be modified, it is for those who would cherish and preserve its artistic elements to consider how far such suggested changes are really essential. It is not to be too hastily assumed that ugly structures are convenient, still less that to be convenient they must necessarily be ugly.

Take another instance of bridge-building. The Menai Straits are spanned by two bridges. The problem was the same in each case, namely, to carry a roadway across the Straits, at a great height, and with the least possible interference with the navigation. The one bridge was necessary for the turnpike road, the other had the more difficult task of supporting the great weight of a railway.

In the first case, the engineer adopted the principle of suspension, and all who have seen Telford's bridge will, I think, admit that far from disfiguring the view, or being a blot upon the landscape, it is a thing of interest, if not of actual beauty, which few would wish absent.

Now, let us consider the case of its younger neighbor, the Britannia Bridge. Here we have the adoption of the trabeated principle of large iron beams laid upon supports of masonry, which rise from the valley beneath, and tower up above the beams, to a height far exceeding that which is necessary for their support.

I well remember the animated discussions in scientific circles as to the form and design of these beams, which were ultimately decided upon as rectangular tubes. In the many discussions of the merits and defects of circular, elliptical, or square sections, I do not recollect that a word was said of architectural effect. Had any one ventured to suggest that this too was an important matter, and that an unsightly structure would be an eyesore for all time, he would have

been promptly told that the forms to be employed were an affair of science alone, and that utility, pure and simple, would dictate their arrangement.

In the result, a lovely valley was defaced by one of the most unsightly structures of this mechanical age. Now the question arises, was this necessary? Let us see. The Britannia Bridge has, at any rate, escaped the flattery of imitation, and the next great bridge which was erected in another part of England differed greatly from it. The distribution of metal in the section of the tubes was questioned, and if the bridge was to be built now, it is perhaps not too much to say that its distinguished author, if he were now alive, would almost certainly adopt a different design.

It is known that the great height of the towers is due to the contemplation of the possible necessity for chains of suspension, to aid in the support of the horizontal beams. The architectural result is unfortunate. A pier or a column is an appropriate expedient to support a weight placed on the top of it. Here the tubes are not on the top, but about two thirds up, and pass through the piers in such a manner as to lead us to wonder how the masonry of the upper parts is supported. The towers, being obviously unnecessary, fail to please, in contrast with those on mediæval bridges, to which I have just referred, the purpose of which was obvious to every passer-by.

The deficiencies of the Britannia Bridge, in an artistic sense, are not, therefore, really due to the dictates of science and utility, but to imperfect apprehension of them, resulting in the introduction of unnecessary features. We have, consequently, a right to test carefully the assertions of those who bid us accept utility on trust as the all-governing principle of even such essentially useful structures as bridges.

I have chosen the latter class of buildings to illustrate my meaning, because in them such a principle may fairly claim to be predominant; but even in matters which more naturally come within the definition of architecture as a fine art utility is not found to be necessarily an opponent. . . .

The age of no-architecture in this country, now happily brought to an end, was fertile in shams and concealed construction. The great engineering works of the present day have at least taught architects that they need not be afraid of exhibiting structural details, although it is unfortunately too obvious that such works have not solved the problem of uniting truth with beauty in such a manner as to become artistic delights, as well as scientific triumphs.

There is plenty of scope for the architect in uniting art with utility. We are told sometimes that utility is so far to rule, that every portion of a design should declare its use, whether such use be noble or ignoble, and however the architectural composition, as a whole, may be affected by such partial treatment. We see daily, in consequence, designs of shreds and patches, which, while affecting to make a god of utility, are often in reality not convenient, while they offend the sense of fitness, which demands dignity and elegance as well as convenience in architectural work.

Nor is this the only evil. In paying tithe of mint, anise, and cummin, the weightier matters of the law are too often neglected. Young architects are apt sometimes to act as if it were a triumph of their art to throw down at random parts of a composition, and accept the result. Irregularity is supposed of necessity to give picturesqueness, and the external quaintness of a house is more studied than either the purse or the comfort of its inmates. This, I need hardly say, is a complete inversion of the principle that our art is based upon utility.

To indulge in such tastes is doubtless far easier than to study carefully the requirements of each building, and consider how they can be artistically complied with. This, however, and no less, is the duty of the architect, and only by performing it thoroughly can he achieve complete success. It is useless for a house, for example, to be delightful to the architect, with gables, turrets, and dormers, if the owner declares that to such matters have been sacrificed warmth, comfort, and ventilation. A design of architecture must always be a compromise, and when one class of considerations obtrude themselves with an exaggerated prominence, the others become more or less sacrificed. . . .

Architecture, of course, is not all utility, and has in her higher character, as we saw in the last lecture, claims on the consideration of society at large. She is bound to assert her place in regard to the public buildings of the country. In this position, at any rate, she can tolerate no derogation from her position as one of the fine arts. It is her province to erect temples of worship and to dignify cities. In humbler works it is her privilege to carry a feeling for art into the homes of the thousands. In fine, she has to unite beauty with utility, and apply the result to the service of men. It should not surely be said of our art that all the good is over. We have the past for instruction, and not for blind imitation. The powers of man are not diminished since the days of the artistic giants of antiquity, while science has conferred upon us privileges of which they little dreamt. Architecture, therefore, pursuing her mission, and supported by Art on the one hand and by Science on the other, may, if true to herself, still look hopefully forward; for, in the language of our President's address, on a recent occasion,¹ in which he sums up the argument in better words than I could use, —

"Certain it is that architects may look with a proud confidence

¹ Discourse delivered to the students of the Royal Academy, on the distribution of the prizes, December 10, 1879, by Sir Frederick Leighton, P. R. A.

into the future, for they practise an art raised on an immovable basis of science, clothing itself in forms of abstract beauty, enriched by the coöperation of sculpture, and yet made lovelier, when it chooses, by the charms of color. And though no man shall invent a new style,—as the foolish phrase goes,—for styles are not invented, but evolved, I do not doubt but that in due time the tentative and eclectic phase through which architecture seems now to be passing will give place to more homogeneous development, in which, whilst the individuality of the artist finds free room to assert itself, the requirements, physical and intellectual, of each particular country will achieve a more definite and distinctive expression."

THE LATE CONSTANTINE BRUMIDI.

BRUMIDI was born in the city of Rome, where he studied, surrounded by an atmosphere of art and with the examples of the noblest works of the greatest masters constantly before him. He attained considerable celebrity in Rome, and such was his standing as an artist that he was favored with a commission to paint a portrait of Pio Nono, and was also employed for a long time in repairing the frescoes of the celebrated Loggia di Raffaello in the Vatican, which were painted under the direction of Raphael by Giulio Romano and his other principal scholars. He came to this country in 1848, and proceeded to the city of Mexico, where he painted altar-pieces for churches, as he did also in New York and other cities after his return. The largest of these is that of St. Stephen's, in New York, which is seventy feet in height.

Coming under the notice of Mr. Walter and General Meigs, who were in charge of the Capitol Extension, then just completed, he was employed to decorate the room of the Committee on Agriculture of the House of Representatives. This was finished in 1855, and gained him much celebrity. It was considered at that time, as far as mere execution was concerned, to have been the best example of mural decoration in the country, and to-day, on account of the excellence of his method of applying the colors, they are as pure and brilliant as when first laid on. While Signor Brumidi's remarkable designs have caused much grief to the judicious, and infinite mirth to the irreverent, he was certainly a master of the difficult process of fresco-painting, which is the most durable known to art. His work in this room, so far as drawing and coloring are concerned, was much more satisfactory from an artistic standpoint than his later work, especially that upon the rotunda on which he was engaged at the time of his death.

Since 1855, Brumidi had been almost constantly at work upon the interior of the Capitol. He decorated with his brush a number of the apartments in the building, and also accomplished the wonderful work of covering the walls of the corridors in the basement story of the Senate wing with mural ornaments of arabesque, combined with representations of the birds, fruits, and flowers of America. The most colossal work executed by him in the Capitol is that of the allegorical painting on the canopy in the dome. This canopy is composed of a basket-work of interlaced iron rods, covered over with a smooth groundwork of plaster, and is suspended like a huge inverted saucer over the circular aperture in the centre of the vaulted ceiling of the rotunda by a multitude of iron rods attached to the ribs of the outer dome.

For a long time past he had been engaged upon the decoration in fresco of the belt that encircles the wall of the rotunda, nearly a hundred feet above the pavement. The belt is about seven feet in height and two hundred and fifty feet in circumference, and upon it Brumidi was engaged in painting, in imitation of sculpture in alto-relievo, a series of scenes representing important events in the history of the country. The belt is divided into fifteen groups and the subjects chosen are as follows: The Landing of Columbus; Cortez and Montezuma at the Temple of the Sun; Pizarro going to Peru; Burial of De Soto; Captain Smith and Pocahontas; Landing of the Pilgrims; William Penn and the Indians; Colonization of New England; Oglethorpe and the Indian Chief; Battle of Lexington; Declaration of Independence; Surrender of Cornwallis; Battle of the Thames and Death of Tecumseh; Entry of the American Army into the City of Mexico; the Discovery of Gold in California. About half of the circumference of the belt is now finished. The effect is such that the figures stand boldly out from the background, and seem to the eye of the spectator below to be sculptured in stone.

Brumidi's work on the Capitol has been executed in genuine fresco. Painting in fresco is done with earthy or mineral colors mixed or ground in water, which are applied to the surface of plaster or stucco while it is still sufficiently fresh or wet to imbibe and incorporate them with itself. The painting is, in fact, a mosaic in colored plaster. It is comparatively indestructible, and will retain its original color and brilliancy unchanged and undiminished for centuries; in fact, as long as the wall upon which it is painted may remain intact. In the process of execution only as much surface of plaster is prepared at once as can be completely finished while it is still wet. Thus the picture has to progress by piecemeal; each little section must be completed so as to harmonize with the rest of the composition, and there is no possibility of retouching after it is dry. Before the process of actual painting on the walls begins, careful and elaborate studies of color and full-sized cartoons or outline drawings are prepared. From the cartoons the outlines are transferred directly to the plaster by dusting through perforations made along the lines

of the drawing, and guided by the color studies, the small section in hand is completed. When it is considered that the colors, when applied to the wet plaster, are much darker than they will finally appear when dry, it will be seen what great difficulties are encountered by the artist. Signor Brumidi, whatever may be said of his designs, understood his process thoroughly, and was enthusiastic and indefatigable at his work. — *Philadelphia Telegraph*.

THE ILLUSTRATIONS.

ST. ANDREW'S HALL, GLASGOW, SCOTLAND.

This important building, which is reproduced from the pages of the *British Architect*, was erected during 1875-76 and 1877, and opened in November of the latter year by Her Royal Highness the Princess Louise and the Marquis of Lorne. It is the property of a public company, and is the outcome of a still larger scheme for providing adequate accommodation of the kind comprised in the building. The sketch plans for the buildings at first proposed were prepared by the late John Cunningham, C. E. and architect, of Liverpool, from whose plans the Philharmonic Hall at Liverpool was erected, and with him was to be associated Mr. Campbell Douglas, of Glasgow, as resident architect. On the original plans being departed from the existing building was designed and carried out under the direction of Messrs. Campbell Douglas & Sellars, F. R. I. B. A. and I. A. In the early stage of the preparation of the plans they had the benefit of Mr. Cunningham's advice, but his death, unfortunately, took place before the work was begun. The buildings comprise the great hall, which is exceeded in size by only two or three halls in the kingdom,—its dimensions are: Extreme length to back of gallery, 180 feet; width, 76 feet; height from floor to ceiling, 56 feet,—and several lesser halls, reception-rooms, etc., on the ground floor. A ball-room suite, including large ball-room, reception-room, and supper-room, etc., is arranged on the upper floor of the front building. The great hall contains a fine organ, erected by Messrs. Lewis & Co., of London.

HOUSE FOR E. H. VAN INGEN, ESQ., WASHINGTON, CONN. MESSRS.

POTTER & ROBERTSON, ARCHITECTS, NEW YORK, N. Y.

OPERATIVES' COTTAGE NEAR BOSTON, MASS. MR. T. M. CLARK, ARCHITECT, BOSTON, MASS.

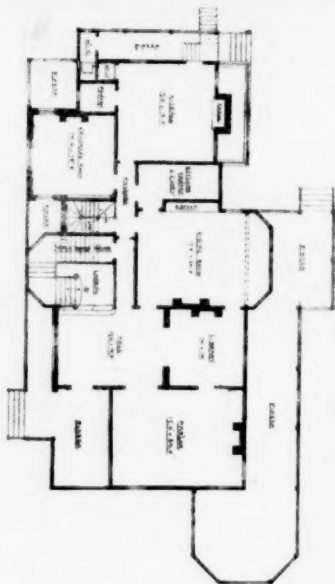
This is one of a number of designs for cottages to be built by a manufacturing company near Boston for the best class of operatives. Contracts just made bring the cost, including cellar, to about \$1,500. Some interest is given to the exterior by the employment of several colors in painting, the roof being a dark slate color, while olive green, light brownish red, Indian red, and a greenish yellow are used on the walls and finish.

CORRESPONDENCE.

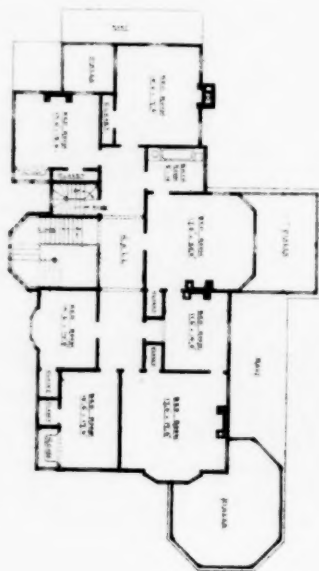
THE TOWN AND ITS BRIDGES.—THE CHURCHES OF ST. LAWRENCE AND ST. SEBALDUS.—THE GERMAN MUSEUM.—PICTURES.—ALBERT DÜRER'S TOWN WALLS.

NUREMBERG.

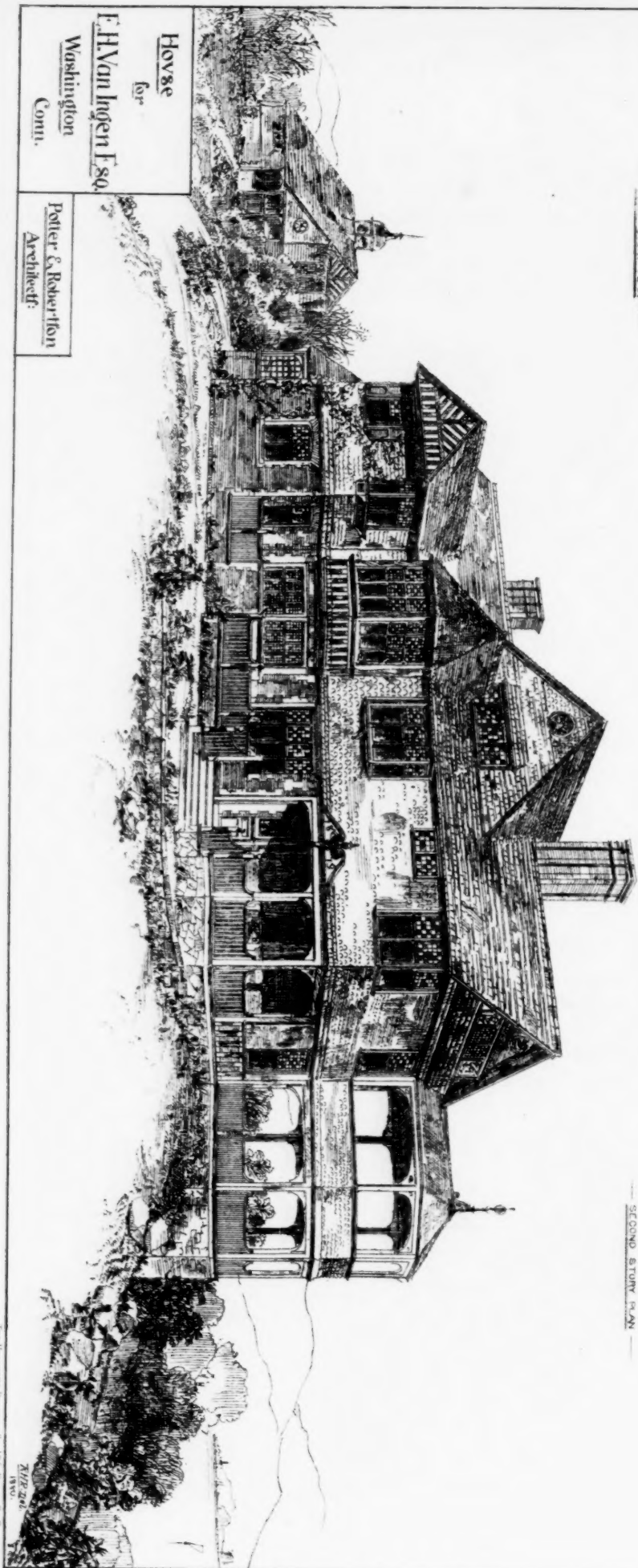
THERE is, perhaps, hardly a place to which an architect looks forward with more curiosity than this famous old town. What fantastic fancies are conjured up by its very name! Surely, Doré has drawn his picturesquely weird sentiment from its wonderful gables and fantastic dormers rising steeply above the narrow streets, and its deserted bastions and watchtowers against a sunset sky, ravens, bats, etc., have inspired his blackest woodcuts. Such, at least, were some of my fancies as I neared Nuremberg in the night train, and if my preconceived ideas of the town were not more definite, it was certainly not for want of seeing illustrations and sketches of it. As I jolted in the omnibus up from the station and under a dark gate-tower, I looked out, vainly however, for something mysterious or fantastic. I was driving up a well-lighted, spacious street which would have in no way scandalized the city fathers of an American town. I remembered then to have heard that Nuremberg had been spoiled and modernized out of its picturesqueness. So when I awoke next morning I had calmed down to quite commonplace expectations; still there were certain things I hoped to find in existence, notably the pretty Renaissance dormer with steeple roof which I had copied into my note-book in the earliest days of my architectural studies. Imagine, then, my surprise on first looking out of my window to find that identical dormer on the house opposite. The coincidence was, however, considerably modified when I found any number of similar dormers down the street. My first ramble about the town quite disposed of my preconceived ideas. In the first place, Nuremberg is not in the least like any of Doré's illustrations—I have serious doubts if I ever shall see anything that is like them. On the other hand, its wide, clean streets are not at all modern. By the special Providence which watches over archæology—alas, so rarely!—the main streets originally were made so much wider than those of most mediæval cities that enterprising modern traffic has not found it necessary to widen them. That this is so is proved by houses dating from the sixteenth century standing on either side of them. These houses are generally without gables,—and are thus unlike the majority of old houses nearer the Rhine,—but above their plain, four-storied front is a steep-pitched roof from which project the well-known dormers. Of the latter there are two chief varieties: one a double window with a steep roof curving up into a miniature steeple, and the other having a single window



FIRST STORY PLAN



SECOND STORY PLAN

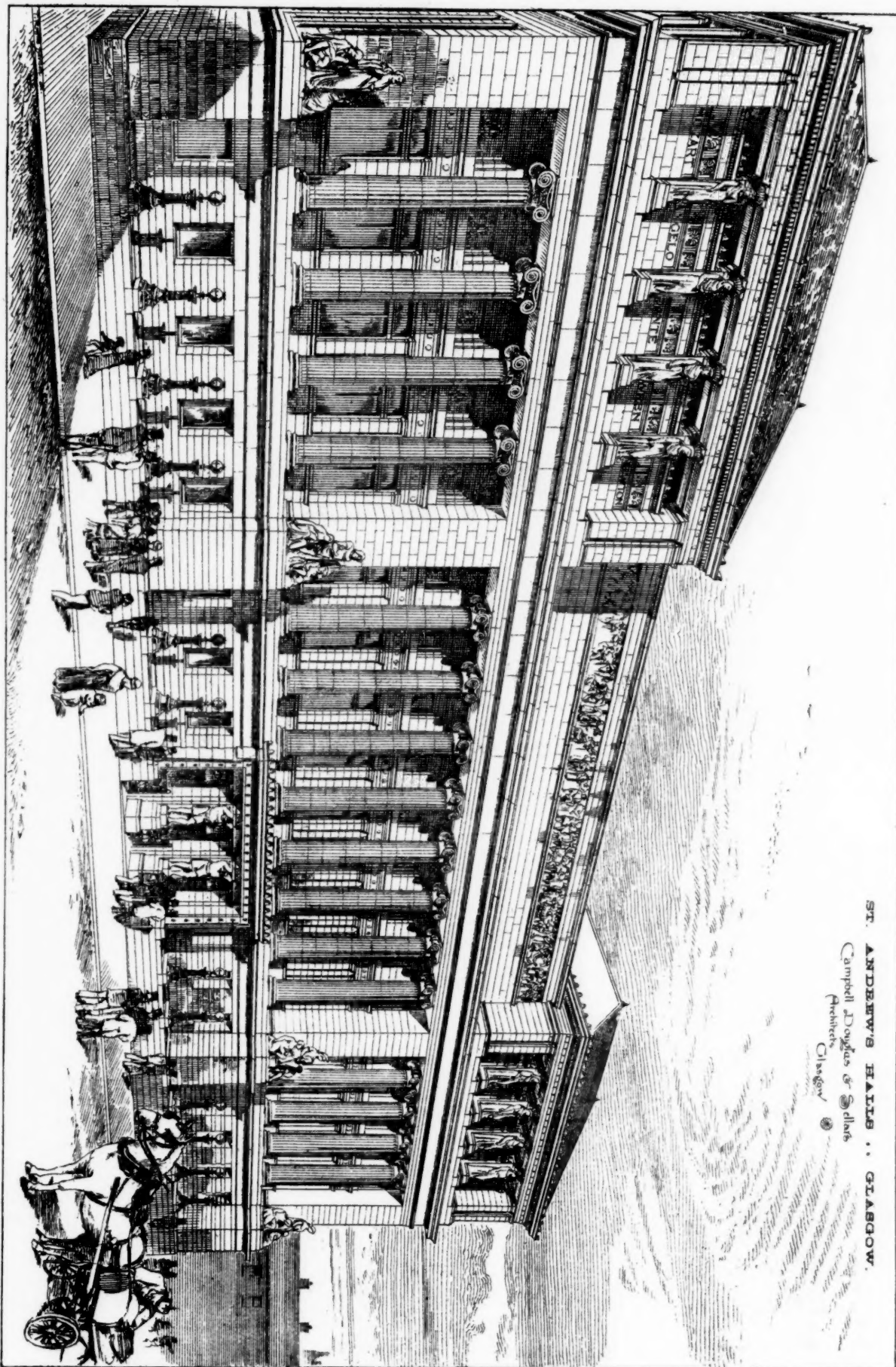


207-208

THE HUNTER, K. OSGOOD & CO. 138 FINE ST. BOSTON

Hove
for
E. H. Van Ingen Esq.
Washington
Comm.

Potter & Robertson
Architects



ST. ANDREW'S HALLS . . GLASGOW.

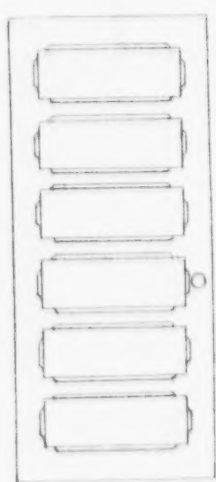
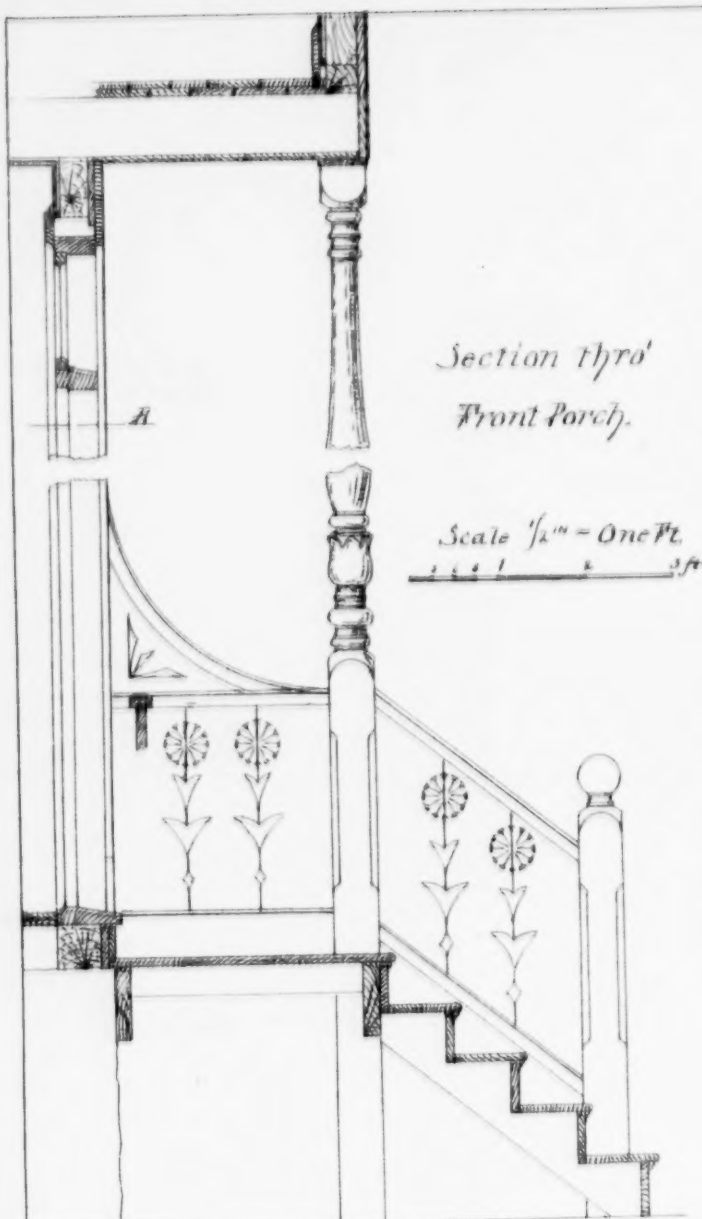
Campbell Douglas & S. Clark
Architects
Glasgow

Maps on this order too large to be
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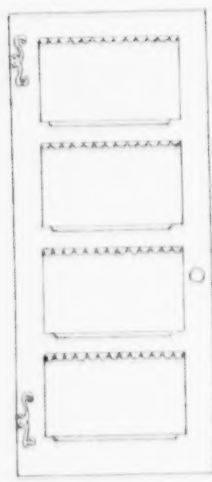


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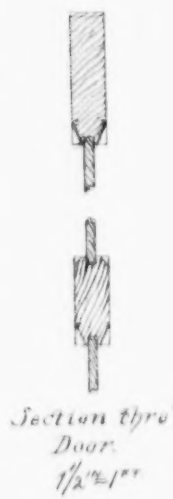
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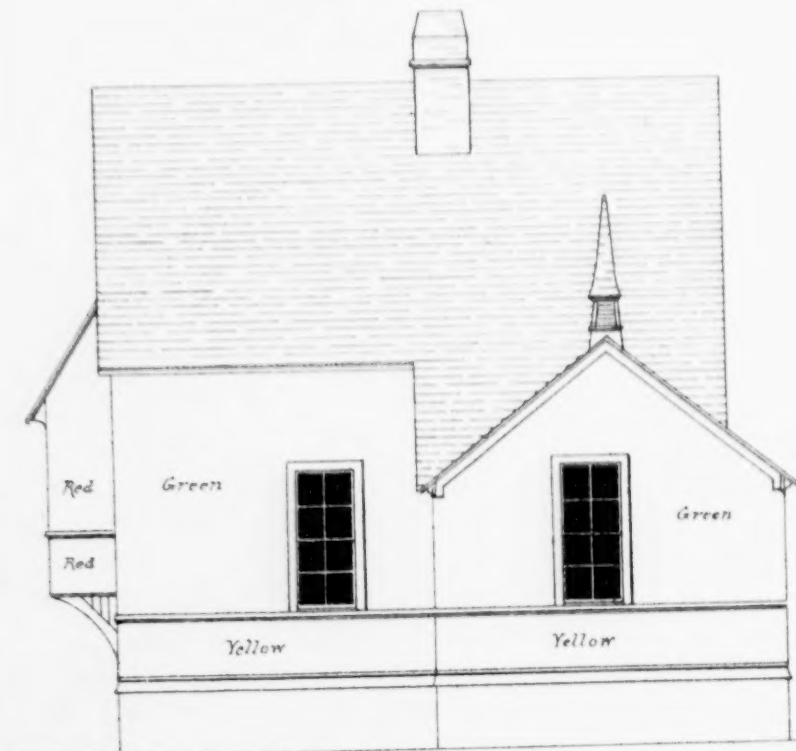
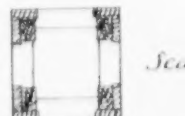
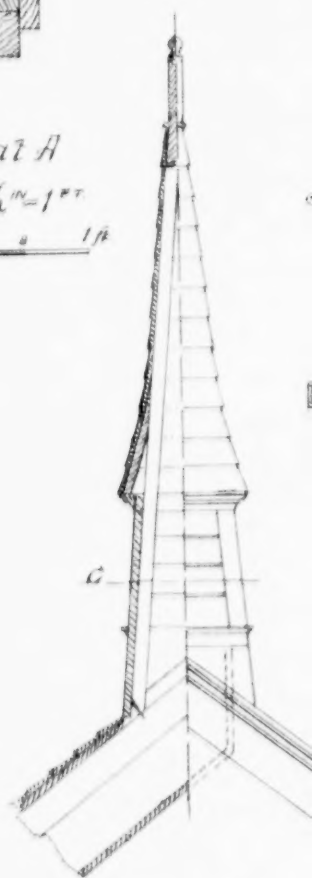
Back Door.



Inside Door.



Scale $\frac{3}{8}$ " = 1 Ft.



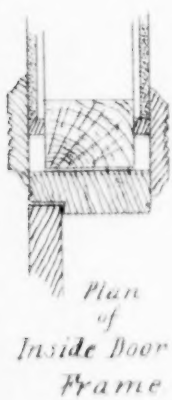


*Design for Cottage
near Boston*

*T. M. Clark Architect
Boston*



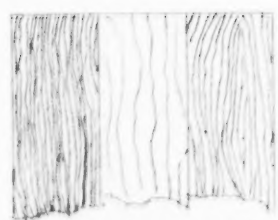
E W



*Plan of
Inside Door
Frame*

Scale 1/2" = 1'

on & Plan (at C)



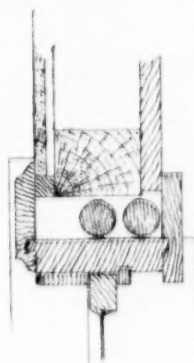
*Floor of Front Hall;
Blk Walnut & Ash,
Alternate*



*Door Architrave
1/2 full size*



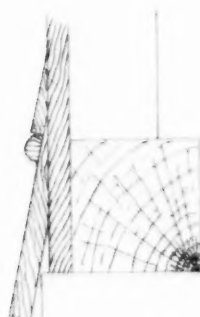
*Hinge Plate
1/4 Full Size*



Plan at B

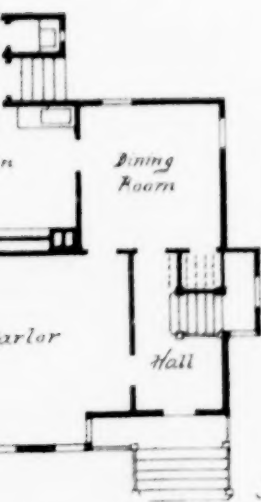
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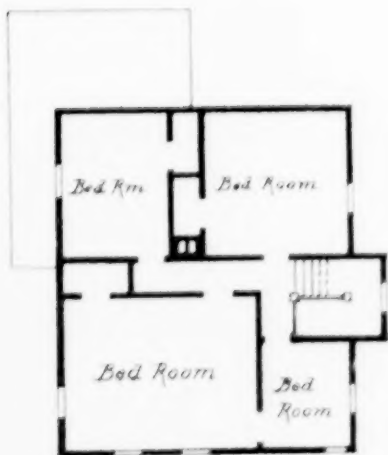
*Section
Sill
Scale 1 1/2" = 1'*

*Framing of
Side Elevation
1/8" = 1'*

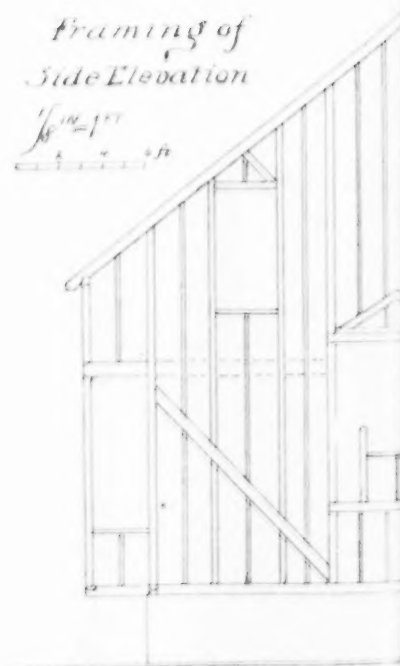


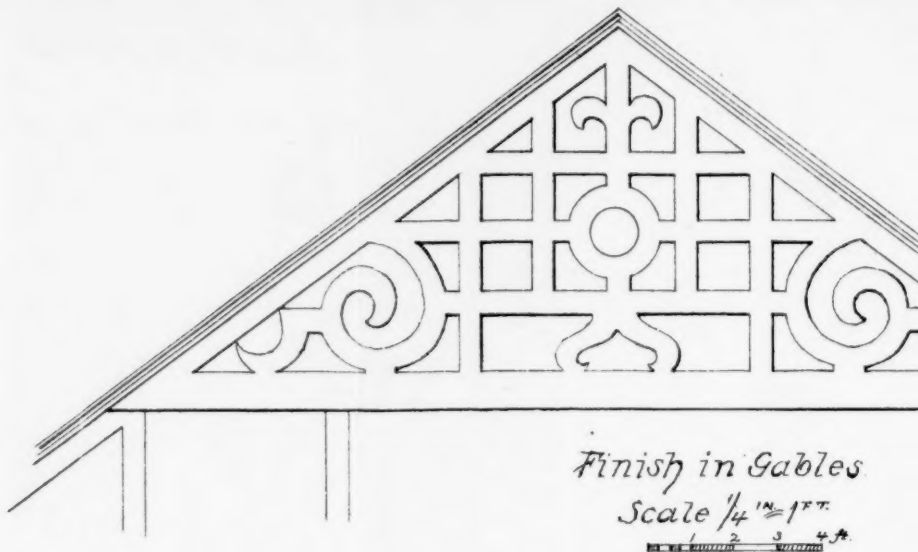
1st Floor Plan

Scale 1/4" = 1'

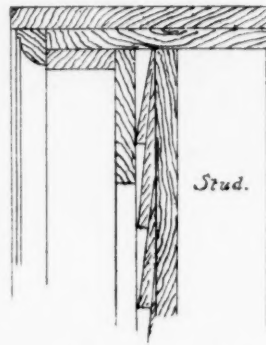


Second Floor Plan

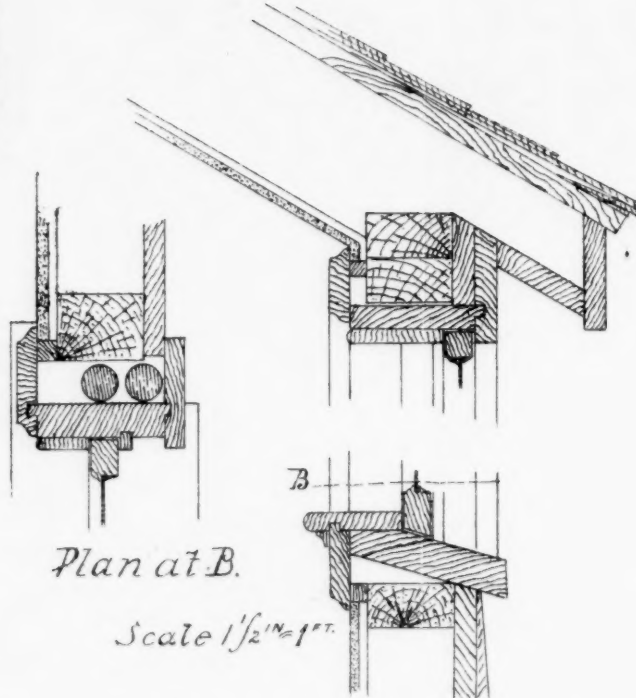




Finish in Gables
Scale $\frac{1}{4}" = 1'7"$



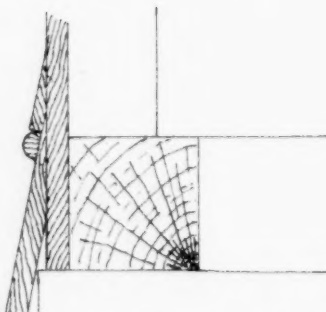
Section thro'
 $\frac{1}{2}" = 1'7"$



Plan at B.

Scale $\frac{1}{2}" = 1'7"$

Section thro' Dormer.



Section thro' Sill
Scale $\frac{1}{2}" = 1'7"$

Design for Cottage
near Boston.
Clark Architect.
Boston.



or of Front Hall;
Walnut & Ash,
Alternate.



Hinge Plate.
 $\frac{1}{4}$ Full Size

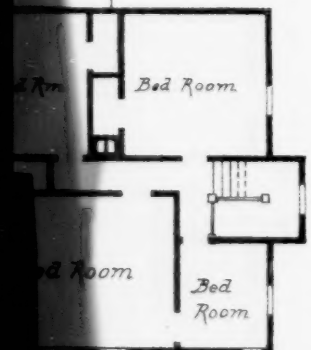
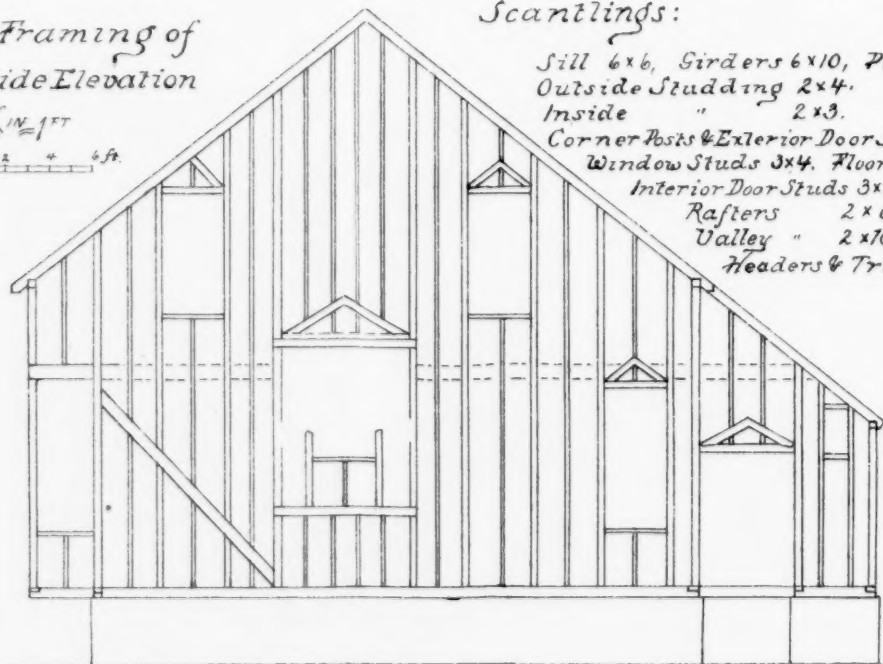
Architrave.
full size.

Framing of
Side Elevation

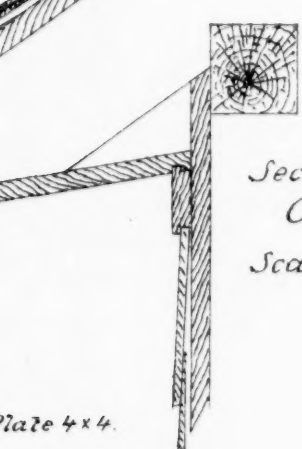
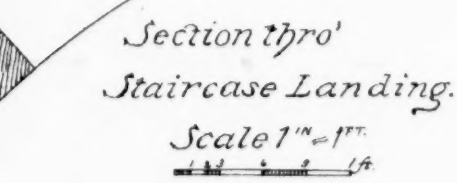
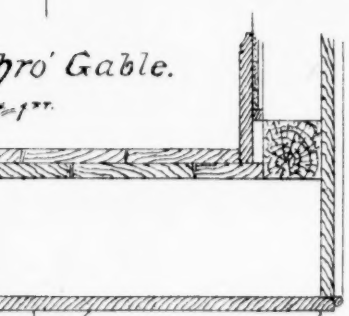
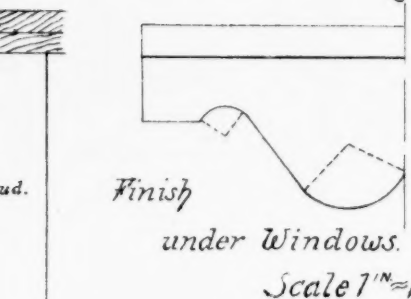
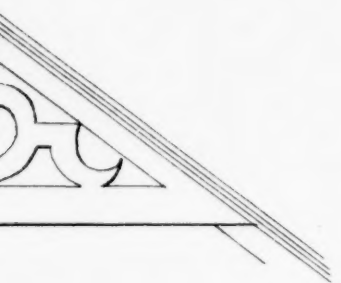
$\frac{1}{8}" = 1'7"$
2 4 6 ft.

Scantlings:

- Sill 6x6, Girders 6x10, Plate
- Outside Studding 2x4.
- Inside " 2x3.
- Corner Posts & Exterior Door Studs
- Window Studs 3x4. Floor Beams
- Interior Door Studs 3x4.
- Rafters 2x6.
- Valley " 2x10.
- Headers & Trim



Second Floor Plan



Plaze 4x4.
Studs 4x4.
Beams 2x8.
4.
6.
10.
Timbers 4x8.

Centre line

Section



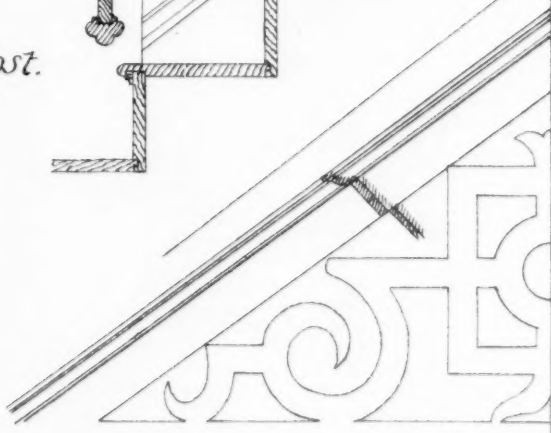
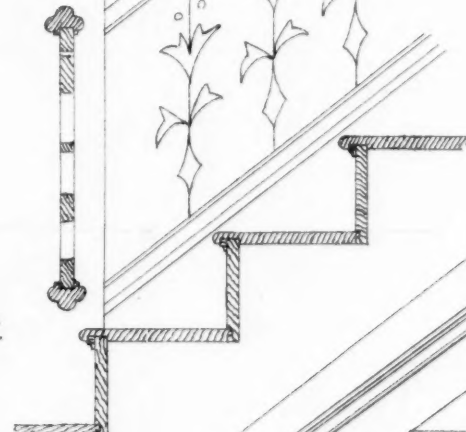
View in Stairway.



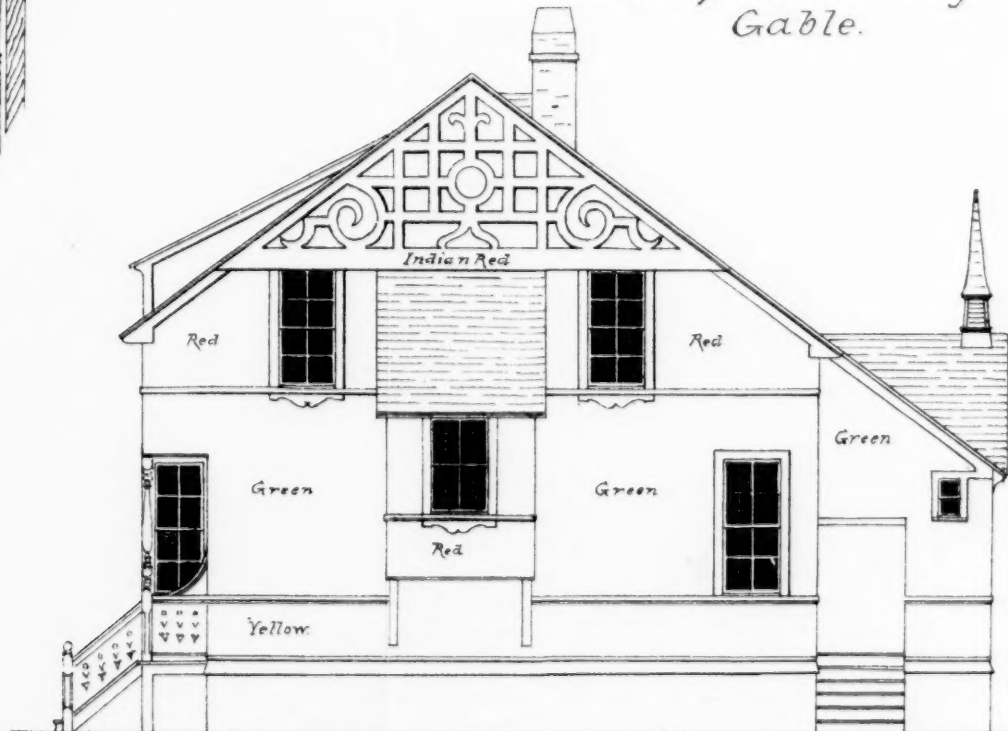
Newel Post.
1" = 1'.



Drop to Newel.



Finish in Small Half-Gable.



Side Elevation.

whose roof is carried out in front of it with an octagonal hood sheltering a pulley. Both kinds have a delicate Renaissance order supported upon consoles projecting from the parapet. Occasionally, however, the sky line is broken by a high stone gable, whose profile and curves recall the Flemish architecture.

As I strolled along I found the street rapidly descending and I was soon gladdened by the sight of a bridge. Any one familiar with European towns knows that it is by the river — and there are few towns which have not one — that will be found the most picturesque views, and even when there are no especially interesting buildings there will always be bright clothing drying over tumble-down balconies, women washing, etc., all giving sharp lights and shadows to be reflected in the stream. But Nuremberg does not depend upon these humble accidents to interest the artist; its shallow, sluggish stream flows between quaint, time-stained houses, and projecting galleries. Solid old bridges are thrown across it at all angles as it winds capriciously through the town. Twice it is divided by islands whose crowded houses topple over the water, and in one place an old fortified bridge wades across to a tower in the middle of the current, but the stream works its way along, turning a dozen mill-wheels, and at last spreads calmly out before issuing from the town under one of the grandest bridges of the Middle Ages. Its vast construction lies like a fortress across the river, its large end pavilions buttressing the great span of the arch under the central gallery. In these massive walls the single range of ordinary windows look mere pigeon holes. To complete this Cyclopean grandeur, the whole is covered by one vast roof. Connecting with this bridge is a smaller one beyond, carrying a pretty covered gallery on corbels. As if to emphasize the solid dignity of mediæval work the economy of our generation has opened a light suspension bridge beside the great bridge, like a spider's web before a cavern. The contrast is great but not offensive, and as one stands on those wire threads and looks up to the pile above, from which comes the hum of modern manufactures, it is impossible to repress a tribute to the Nurembergers who have thoughtfully found means to reconcile historic glories with modern enterprise. For with all its old-time aspect, Nuremberg is not dead or decaying, but is rapidly regaining the prosperity which gave it such importance in the sixteenth century, and is to-day the most enterprising and growing city of South Germany. Yonder it was found necessary to replace a wooden mill by a new brick one, and it has been simply and cleverly done; its timber framing harmonizes with the surrounding buildings, and a square tower — apparently for some part of the machinery — gives it a claim of its own to the picturesque. Throughout the town I noticed the same consideration for old buildings and an effort to reconcile the new ones with them. There is some talk of taking down the walls of the town, but judging by the spirit thus far shown, I doubt if there will be a wholesale destruction of them, but rather more frequent openings pierced to facilitate communications. At any rate the example of what has already been done points sharply to a fact which needs to be clearly expressed. It is not modern necessities which have swept away priceless ancient monuments, but the brutal nineteenth-century contempt of everything which does not minister directly to sordid gain. In England it is fashionable to affect archaeological enthusiasm, and lately a magnificent burst of righteous indignation protested against a wholesale destruction of an Italian building — sheer presumption in its dual sense; but not long before few and feeble were the voices raised to preserve from total destruction one of their most picturesque and famous old monuments. In view of the expensive site, it was folly to think of widening the street on either side of Temple Bar! So England quietly accepted one of the most flagrant cases of wanton destruction. All honor then to the worthy Nurembergers who have set such an excellent example.

After a glance under the great arch I have described, through to the pretty public gardens by the river's bank beyond, turn from this quiet scene and look up the river to the bewildering mass of houses and steep roofs which rise pell-mell one above the other up to the sharp spire of St. Lawrence on the ridge above. Especially at sunset the contrast is very striking and illustrates the naive simplicity and breadth of effect which is constantly contrasted in mediæval life with minute details.

There is an excellent example of this in the large market place. On one side is the Roman Catholic Cathedral, built in the fourteenth century, which, though only ranking third in importance among the churches of the town, has a rich and curious façade. Its gable is screened with elaborate arcades and is carried up into a little open-roofed turret or pinnacle. Under this there is a florid two-storied porch, the second story slightly in retreat with its angles cut off for windows, which gives occasions for a device, common in Gothic octagonal buttresses, but rare on this scale, of curving the gable back to reach the polygon sides. Across the square is a celebrated Gothic fountain rising in an elaborate spire of four divisions or stories of arches, pinnacles, and statues. The design is light and elegant and of marvellous workmanship. To contrast with these two examples of detailed design one whole side of the square is occupied by a great building whose immense surface of plain wall, lifting its parapet above the dormers of the five-storied adjoining houses, is pierced by only three ranges of widely spaced windows. It is most imposing. I never went through that square without mentally taking off my hat before its grand simplicity. It is not the least of the difficulties of the architects of to-day that they must provide an amount of light for the

interiors unknown and unsought in preceding centuries, and which thus permitted those magnificent wall-surfaces, sharply accentuated with rare openings, which will be found to be a most important factor in all truly monumental architecture, whether Egyptian or Grecian temple, Arabian mosque, Byzantine church, or Florentine palace. The partial elimination in churches of this factor forced the Gothic architects to prodigious efforts to supply its place by ingenious and costly devices. The question arises whether these devices can help us to build monumentally, or whether we have another problem and a new solution before us.

The two finest churches in Nuremberg are those of St. Lawrence and St. Sebaldus, both of which are Protestant, as are most of the churches, for out of 91,000 inhabitants there are only 9,400 Roman Catholics. St. Lawrence, standing on high ground near the entrance from the railroad station, is the most conspicuous as well as the largest. Between its two towers is an elaborate open-work gable and under this a beautiful and original rose. The rich window itself is set back on the inner side of the hall, while the outer side is elaborately carved around it in a circular band with an open cut fringe within; this casts a striking shadow upon the window itself and is a beautiful device which I am surprised to find was so rarely adopted. The porch is shallow and minutely carved in bas-reliefs, but with less of the dryness habitually found in German florid sculpture. The church was building from the end of the thirteenth century to the end of the fifteenth, and it is within that the earliest work is visible, where slender clustered pilasters between the lancet nave arches carry the shafts of the quadripartite vaulting. A peculiarity is that there is no triforium, but the lofty space above the arches into the aisles up to the clerestory is left quite bare. Chapels are added to the aisles between the thickness of the buttresses. The choir is later and has in the crown of its vaulting an elaborate net-work of ribs. In the choir near the transept is a charming little sacristy, and an elegant stone stair turret against the hall leads to a second story.

The most famous work in the church is a *tour de force* in the lace-like carving of a very lofty pinnacle above a sort of tabernacle. Except this the whole church is remarkably free from what I have previously called German dryness. The eleven windows of the choir are filled with beautiful glass, one, with the genealogy of Christ, having a lovely silvery tone. As a rule the designs are cut up into small panels with figures, and in one case these panels are set in a dark neutral tinted ground chased over with delicate arabesques. But color is not confined to the windows, as the dark stone walls are almost hidden in places behind the painted coats-of-arms of noble families, which are hung capriciously about. They are anything but ecclesiastical, yet are to be found in all the churches in this country, and certainly give animation to the walls, which are further garnished with statues, pictures, and crucifixes. Before the high altar hang carved wood statues of the Virgin and an announcing angel fastened within an oval hoop. Not far beyond, from a bar across the choir, rises a wrought-iron crucifix with elaborate leaves and branches sprouting from it. All this, as may be imagined, gives a curious mediæval picturesqueness, appealing more directly to the bric-a-brac collector and painter than to the architect, yet fascinating to the latter, perhaps, none the less. St. Sebaldus is rather smaller than St. Lawrence and dates from the thirteenth century. It has two choirs like the Rhine churches, but otherwise has no similarity with them. Between the exterior buttresses of the apse are some groups of figures, finely sculptured by Adam Kraft (1492), who also worked upon the rich portals. Within there are many of the same characteristics as at St. Lawrence, but among the pictures hung against the pillars are some fine works. A burial of Christ, attributed to Albert Dürer, is full of tender sentiment. The tomb of St. Sebaldus is one of the most patient works of the laborious sixteenth century. The celebrated Peter Vischer wrought upon it, with his five sons, thirteen years! It consists of an elaborate bronze canopy with some twenty-five statuettes, and an endless number of bas-reliefs and grotesque ornaments. The wonder of this patient elaboration is what considerations finally convinced the artists that they had finished their work. The windows of the choir have fine old glass, but very dark — far too dark for true architectural effect; the prevailing tones are dark green and reds, with a rare use of blue. A powerful effect might be produced by a graduation from such dark windows in a nave to brilliant ones in the choir, or *vice versa*, but I do not remember to have seen this systematically tried.

I have never seen a more charming arrangement of a museum than that of the German Museum founded here in 1852. If anything was wanting to prove the good taste of these people, of which I have spoken above, their adaptation of the old Carthusian monastery of the fourteenth century would be conclusive evidence. Around a large cloistered court are arranged in some twenty-six halls, chapels, and galleries a precious Gothic collection, to which additional charm is given by the quaint old-fashioned arrangements. The large pictures and pieces of furniture are in the halls, and the small objects — such as a fine collection of locks, for the iron-work here is celebrated — in chambers of the monastery which have been judiciously painted and restored. The open-timber roofs and wooden vaults of the chapels and halls have been completely, and perhaps rather complicatedly, restored also. There is a large collection of early printing and woodcuts, among the latter, of course, many an Albert Dürer, and some by Holbein. It is noticeable that while his woodcuts have such sharp accentuation with black dots and heavy lines, his pictures have

an exaggerated smoothness and want of emphasis. His celebrated portrait of Maximilian First and others are to be seen here. There is also here a fresco by Kaulbach which, with the exception of one — amongst several poor ones — in the New Museum of Berlin, is the best I have seen by him. The dramatic subject of the opening of the tomb of Charlemagne by the Emperor Otto III., he has treated with great power.

There are two other picture galleries; the most important one, the one in the St. Moritz Chapel, is a fine collection of the German and Flemish schools. I have no space to speak of the well-known pictures here by Holbein the elder, and of Dürer's still more celebrated *Mater Dolorosa*, but I must mention several very beautiful Madonnas and Saints by Hans Burgkmair (1473-1531), whose lovely and richly-enamelled color and truth of expression I had never before realized. His low, rich tones seem to me to have influenced the leaders of the present Munich school.

To reach the other pictures you must climb the other slope of the town, passing several fine old houses with high carved gables and projecting oriel windows, up to the castle which overhangs the city to the north. Its great towers and red-tiled roofs give a grand outline against the sky. Passing under a lofty round tower, a landmark for miles around, one enters a pretty, irregular court, surrounded with wooden balconies. In the centre is one of those 800 year old yew trees, to which one is respectfully presented in various chosen spots of Europe. Beside superb views over the fantastic red roofs of the city to the fertile plains round about it, there is little of special interest to be seen. The castle, founded in 1024, was last restored in 1856. Among the pictures preserved in the chapel is Dürer's *Path to the Cross*, to me his most impressive work. This is a masterly conception, and a fervent, strenuous, and, at last, successful effort to express it. The whole sentiment of the picture is most devout and tender, and it is impossible to connect it with the bold, almost brutal, hand which chipped out those coarse wood-cuts. His large wooden house with its big roof, so often sketched, is carefully preserved, and stands just below the castle.

Before closing this imperfect sketch of a town probably the most sketched in Europe, and yet never exhausted, let us hurry down from the castle and pass out under the vast outlying vault, or rather tunnel, which connects with the drawbridge of the moat. The latter is very wide and deep, — in fact, a small valley in which are cottages and gardens. At the angles of the bastions, which enfilade the drawbridge, are enormous and boldly-carved shields with coats of arms. The famous fortifications of Nuremberg date from the fourteenth and fifteenth centuries, and surround the city with a double line of defence, — the inner walls, and at a short distance, a counter-scarp and moat. The latter were erected to meet the new exigencies of fire-arms, and have the genius of Vauban's three systems, the foundation of modern defences. Following the walled rampart or *boulevard*, one soon comes upon one of the huge round towers which guard the four principal gates of the city. A fifth, of like design, but less massive, defends the castle entrance. Nothing can be grander than these massive towers. The Romans never reached in their military works a grander result than is here shown. Machicolations and corbelling, with all their perfected architecture, were ruthlessly swept away by the invention of gunpowder, and the architect, deprived of all previous traditions, was obliged suddenly to create a new style, — a problem we of the nineteenth century can appreciate. Sincerity of purpose and a disciplined art produced a noble result. These towers are almost without openings, and were defended from the parapet by cannon served behind wooden embrasures. Over all is a flat tile roof with a steep pitched lantern or observatory in the middle. There is perfect unity of conception between the mouldings supporting the parapet and solid cylindrical mass which they crown, and which is more than twenty metres in diameter. A single robust curve swells out to support this parapet, and below is a semicircular moulding and fillet which is again repeated a short distance lower down as an astragal. Except a rusticated basement this is all there is to break the wall-surface, and yet a great work of art is before us, by the hand of a great master. The same hand which dashed off those brilliant wood-cuts, and which tenderly lingered over *The Path to the Cross*, designed these grand towers and their adjoining gates. Albert Dürer as painter, engraver, and architect may claim a threefold fame from succeeding centuries; but surely during lifetime his greatest glory must have been to have so magnificently fortified his native city. I would gladly describe these picturesque old walls and towers in detail, but as I could, at best, but tantalize the curiosity of those who have not seen them, I had best close with the wish that they may some day.

R.

OLD AND NEW BUILDINGS. — THE HOUSE OF W. CLARK, ESQ. NEWARK, N. J.

APART from dingy brick factories and high smoke-stacks, Newark is a wooden city, with all that the name implies, of cheap ornament and poor construction. The exceptions consist of a liberal scattering of solid stone churches with honest spires of masonry. There are houses of stone and brick, the luxuries of a few, but even among these, evidences of much architectural training are not frequently apparent. For the most part, though ranking among the chief manufacturing cities of the country, Newark cannot be charged with

lavishing art upon her exterior. From names of Newark families one may conclude that the colonial stock is still well represented here, but it must be a cause of regret that they have so generally lost the building traditions of their ancestors, whose mansions have doffed their old garb, and have not even been allowed to retain the ornament of a meek and quiet spirit.

As one strolls up and down he will discover in odd places some relics of a better period. Among the churches "*Old Trinity*" is conspicuous, almost the only record left, except the venerable trees, in a locality that must once have abounded in fine examples of colonial work. This church is said to be of ante-revolutionary date. If so, it carries its age with vigor. It exhibits splendid masonry in small squared stones. The steeple, set upon a stone tower, is of wood and painted white in the fashion of those days. It is of good proportion, and simple in construction, — not "churchly" as the phrase goes now, but with an air of old-fashioned godliness nevertheless. The Egyptian front of the old court-house on the side-hill near Market Street is another fragment of a better period; but "*Cockloft Hall*," made memorable by Washington Irving, and notable as the residence of many men of distinguished names, has lost its identity under the spirit of improvement. The old Kearney Mansion on Belleville Avenue, among its contemporary trees, gray, broad-breasted, and hospitable, with excellent proportions, chaste mouldings, and a suggestion of wide fireplaces under quaint wood mantels, is one of the notable relics of colonial building. The Rectory of the House of Prayer tranquilly rests under a gambrel roof, but when one looks for the ancient meeting-house, its mate, he sees only a handsome modern church.

Of new public buildings the Newark Mutual Benefit Life Insurance Company owns and occupies an imposing one of massive proportions, which is conspicuous as a step beyond the sterility which surrounds it. Nearly opposite is another, less self-asserting and of chaster style, wearing an air of refined feeling in agreeable contrast with some near examples where the idle use of decoration is called architecture.

Among recent domestic work the mansion of Mr. Hopper on High Street is most quoted. The least that can be said of it is that it is a novelty. The material of the outer walls is the green serpentine stone from Pennsylvania. The architect has treated it in the only way it can be successfully employed, as a villa style, for which the site affords the opportunity. The lot is spacious and the mansion broad, right, left, and rear, rising into a tower on the east. It is much admired by some and would attract attention if only for the rarity of the material. Lower down, on High Street, is Mr. Rankin's brick house, better than is often seen in this city. Its architect had ideas, and has expressed them with true refinement; whilst there is no wanton destruction of straight lines, there is an agreeable variety of form — the chimneys are strongly emphasized — the roof windows obviously where they are most needed. The entire grouping is well balanced — the color sober but energetic.

One of the chief examples of a new departure in domestic architecture, as regards both construction and architectural effect, is the house now building for Mr. Wm. Clark. Its site is exceptionally fine, with difficulties to be overcome. The problem was to crown a high hill with a homelike structure, not castle and not public building, but immense in size. The subject has been well handled, as the result will prove when the roof is completed with its all important chimneys and dormers. The chimneys in particular are vigorous features in the massing of roof effects. The position on Mt. Prospect Avenue is the finest that could be chosen. The view is vast and of peculiar beauty. On the east, the natural front, is a bird's-eye view of the entire city of Newark, which lies in the valley below, divided into East Newark and Newark proper by the Passaic River. At the lighting of the lamps the scene is magnificent. The smoke and blaze of many factories, together with the crossing lines of street lamps, repeated for miles, present an illuminated picture of ideal brilliancy. Over beyond Newark, rising among forest trees, are the towers and gables of the mansion of the late General Kearney, and still beyond, across Newark Bay, nine or ten miles away, lies the ocean, narrowing into New York Bay, and at its head the city of New York, where on a clear day the piers of the Brooklyn bridge are plainly visible.

The entrance to the mansion is bravely put away to the south, not to intrude upon this field of vision. To the average client the obvious front would have been on Mt. Prospect Avenue, where he would have insisted upon asserting himself — and the average architect would have spent himself in carved capitals and pediments.

In style the Clark house may be called Baronial. Mainly the plan, as indicated by the roof lines, is roughly a figure , the exterior angles being filled by square, level-roofed attachments of variable heights filling out the ground plan to the dimension and form of about one hundred feet square, and affording a pyramidal grouping. The roof is a gable one with all ridges on the same line, and sloping down to the same plate level. The materials are brick and stone; the former a dark cherry-red from Philadelphia, and the latter a rich blue of close texture from near the slate regions of Pennsylvania. The quoins, the parapet copings, and chimneys are of stone. Dentil string-courses of rich design mark the height of the second and third stories.

The plan of the house being square the projecting portions are in squares. A square veranda fills an angle on the northeast corner,

its flat roof being supported on clustered square pilasters of stone, disengaged, and resting on a brick pedestal and bound near the top with a single stone band. Its roof is surmounted by a stone parapet from three to four feet high and pierced in squares of well-judged depth to produce rich effects of shadow.

Not to be too rigidly square, however, a mullioned bay-window on the east, opening from the library, is in the form of a semicircle, and springing from a soberly sculptured corbel, in a return near the level of the top of this window, is an oriel of stone which reaches to the top of the third story, and thence carried up terminates in a stone finial done in quiet carving. The stone parapet surmounting the veranda is repeated at the summit of the semicircular window, and again at the square two-storied mullioned bay on the north, and a two-storied observatory on the east.

A marked characteristic of the design is its equilibrium. The absence of superfluous ornament is conspicuous. It cannot be doubted, however, that the present tone of the structure is severe and cold. Its lines are sometimes rigid, and it is open at least to the criticism of too great an economy of decoration; as if the architect in striving to avoid the vice of intemperance in ornament had fallen into the opposite sin of asceticism.

The entrance porch on the south is a model of subdued effort towards decorative freedom. It occupies the first story of a projecting wing. It has four columns of two feet diameter, in three colors: the pedestal of Rhode Island gray granite tooled, the lower portion of the shaft of red polished granite, and the upper portion and capital of the blue stone employed in the building. On the front the entablature is massive—the architrave, a solid blue stone block thirteen feet span, bearing a plain frieze. Surmounting all there is a balustrade of rich design enclosing a balcony from a window of the second story. The corner posts of the balustrade continued downwards form a portion of the decorative work of the capital. On either side the entablature is pierced with half-wheel rayed openings. The whole effect of the porch is a nearer approach to levity than is evident elsewhere. But the architect bursts into a frolicsome mood at the summit of his massive stone dormers, where he has placed two stone finials suggesting a cross between an Indian war club and a champagne bottle.

The walls are of brick and stone laid up in cement mortar, with a strip of lead at each joint of stone. The interior walls are all of brick, and the rooms so planned that the division walls, carried from cellar foundation upwards, meet the three main divisions of the roof so as to constitute their proper bearings. Where necessary breaks occur they are spanned by stout iron girders upon which the wall is continued.

Unexpected difficulties were met in excavating for the foundation. In places it was necessary to dig for a firm bottom to the depth of fifteen or twenty feet. These pits were filled with concrete of cement and stone. The enclosing cellar wall is of native stone to the ground level, two feet ten inches in thickness, handsomely jointed and tooled on its interior face, and outside coated with a layer of cement one inch thick. The footing-course under the partition walls is of proportionate depth, and two feet four inches thick, carrying the brick wall, sixteen inches thick, to the roof. Much outside criticism is indulged on what is termed the useless expenditure for a mere dwelling-house, the costly foundations being a subject of especial remark.

G.

MR. RUSKIN ON ST. MARK'S.

My friends have expressed much surprise at my absence from the public meetings called in defence of St. Mark's. They cannot, however, be too clearly certified that I am now entirely unable to take part in exciting business, or even, without grave danger, to allow my mind to dwell on the subjects which, having once been dearest to it, are now the sources of acutest pain. The illness which all but killed me two years ago was not brought on by overwork, but by grief at the course of public affairs in England, and of affairs, public and private alike, in Venice; the distress of many an old and deeply regarded friend there among the humbler classes of the city being as necessary a consequence of the modern system of centralization as the destruction of her ancient civil and religious buildings.

How far forces of this national momentum may be arrested by protest, or mollified by petition, I know not. What in either kind I have felt myself able to do has been done two years since, in conjunction with one of the few remaining representatives of the old Venetian noblesse. All that now remains for me is to use what time may be yet granted for such record as hand and heart can make of the most precious building in Europe, standing yet in the eyes of men and the sunshine of heaven.

The drawing of the first two arches of the west front, now under threat of restoration, which, as an honorary member of the Old Water-Color Society, I have the privilege of exhibiting in its rooms this year, shows with sufficient accuracy the actual state of the building, and the peculiar qualities of its architecture. The principles of that architecture are analyzed at length in the second volume of the *Stones of Venice*, and the whole façade described there with the best care I could, in hope of directing the attention of English architects to the forms of Greek sculpture which enrich it. The words have been occasionally read for the sound of

them; and, perhaps, when the building is destroyed, may be some day, with amazement, perceived to have been true.

In the mean time, the drawing just referred to, every touch of it made from the building, and left as the color dried in the spring mornings of 1877, will make clear some of the points chiefly insisted on in the *Stones of Venice*, and which are of yet more importance now. Of these, the first and main ones are the exquisite delicacy of the work and perfection of its preservation to this time. It seems to me that the English visitor never realizes thoroughly what it is that he looks at in the St. Mark's porches. Its glittering confusion in a style unexampled, its bright colors, its mingled marbles, produce on him no real impression of age, and its diminutive size scarcely any of grandeur. It looks to him almost like a stage scene, got up solidly for some sudden festa. No mere guide-book's passing assertion of date, this century or the other, can in the least make him even conceive, and far less feel, that he is actually standing before the very shafts and stones that were set on their foundations here while Harold the Saxon stood by the grave of the Confessor under the fresh-raised vaults of the first Norman Westminster Abbey, of which now a single arch only remains standing. He cannot, by any effort, imagine that those exquisite and lace-like sculptures of twined acanthus—every leaf-edge as sharp and fine as if they were green weeds fresh springing in the dew, by the Pandroseion—were, indeed, cut and finished to their perfect grace while the Norman axes were hewing out rough zigzags and dentils round the aisles of Durham and Lindisfarne. Or nearer, in what is left of our own Canterbury—it is but an hour's journey in pleasant Kent—you may compare, almost as if you looked from one to the other, the grim grotesque of the block capitals in the crypt with the foliage of these flexible ones, and with their marble doves, scarcely distinguishable from the living birds that nestle between them. Or, going down two centuries (for the fillings of the portico arches were not completed till after 1204), what thirteenth-century work among our gray limestone walls can be thought of as wrought in the same hour with that wreath of intertwined white marble, relieved by gold, of which the tenderest and sharpest lines of the pencil cannot finely enough express the surfaces and undulations? For, indeed, without and within, St. Mark's is not, in the real nature of it, a piece of architecture, but a jewelled casket and painted reliquary, chief of the treasures in what were once the world's treasures of sacred things, the kingdoms of Christendom.

A jewelled casket, every jewel of which was itself sacred. Not a slab of it, nor a shaft, but has been brought from the churches descendants of the great Seven of Asia, or from the Christian-Greek of Corinth, Crete, and Thrace, or the Christian-Israelite in Palestine,—the central archivolt copied from that of the Church of the Holy Sepulchre, and the opposing lions or phoenixes of its sculptures from the treasury of Atræus and the citadel of Tyre.

Thus, beyond all measure of value as a treasury of art, it is also, beyond all other volumes, venerable as a codex of religion. Just as the white foliage and birds on their golden ground are descendants, in direct line, from the ivory and gold of Phidias, so the Greek pictures and inscriptions, whether in mosaic or sculpture, throughout the building, record the unbroken unity of spiritual influence from the Father of light—or the races whose own poets had said, "We also are his offspring"—down to the day when all their gods, not slain, but changed into new creatures, became the types to them of the mightier Christian spirits; and Perseus became St. George, and Mars St. Michael, and Athena the Madonna, and Zeus their revealed Father in heaven.

In all the history of human mind there is nothing so wonderful, nothing so eventful, as this spiritual change. So inextricably is it interwoven with the most divine, the most distant threads of human thought and effort, that while none of the thoughts of St. Paul or the visions of St. John can be understood without our understanding first the imagery familiar to the pagan worship of the Greeks, on the other hand no understanding of the real purport of Greek religion can be securely reached without watching the translations of its myths into the message of Christianity.

Both by the natural temper of my mind, and by the labor of forty years given to this subject in its practical issues on the present state of Christendom, I have become in some measure able both to show and to interpret these most precious sculptures; and my health has been so far given back to me, that if I am at this moment aided, it will, so far as I can judge, be easily possible for me to complete the work so long in preparation. There will yet, I doubt not, be time to obtain perfect record of all that is to be destroyed. I have entirely honest and able draughtsmen at my command. My own resignation of my Oxford professorship has given me leisure, and all that I want from the antiquarian sympathy of England is so much instant help as may permit me, while yet in available vigor of body and mind, to get the records made under my own overseership, and registered for sufficient and true. The casts and drawings which I mean to have made will be preserved in a consistent series in my museum at Sheffield, where I have freehold ground enough to build a perfectly-lighted gallery for their reception. I have used the words "I want," as if praying this thing for myself. It is not so. If only some other person could and would undertake all this, Heaven knows how gladly I would leave the task to him. But there is no one else at present able to do it. If not now by me, it can never be done more. And so I leave it to the reader's grace. J. RUSKIN.

THE STOPPAGE OF FIRES IN WALLS AND FLOORS.

TO THE EDITOR OF THE AMERICAN ARCHITECT :

Dear Sir, — I am very much interested in the question of the possibility of building houses more solidly and rendering them at least comparatively fire-proof. We are ourselves on the point of building a country house, under the supervision of competent and well-known architects, but I have been unable to awaken in them the interest I feel in solid and at least comparatively fire-proof construction.

It seems to me that hollow spaces between the lath and plaster and outside walls form a radically wrong system of construction. Also hollow spaces in partitions, and between floors and the ceilings under are wrong, affording a galloping ground for rats, and a chimney draught for any fire that may be started.

A builder told me yesterday that it is possible to fill up these spaces with sand.

Will you kindly let me know by letter, or through the columns of your paper, of which (though a lay woman) I am a constant reader, what you think of the merits of such a method. It would not be very expensive, I think, as building a separate brick wall from cellar to roof would be.

I am yours very truly,

SUBSCRIBER.

[We cannot greatly praise the idea of filling the frame of a house with sand. The weight of sand for an ordinary house would be some hundreds of tons, and would amount to a hundred pounds per square foot on the floors alone, more weight than it would be wise to trust permanently on the floors of a common house, and enough to break down a great many. While the sand was dry it would be continually jarring out of many cracks; when water leaked in it would absorb a great quantity, adding greatly to its weight, and bringing danger of dampness and rot. We must defer, for the moment, entering upon the question of fire-proofing. Perhaps some of our readers will help us out. — EDS. AMERICAN ARCHITECT.]

PUBLICATIONS RECEIVED.

A BOOK ON BUILDING, Civil and Ecclesiastical, including Church Restoration with the Theory of Domes and the Great Pyramid, and Discussions of many Churches and other Great Buildings. By Sir Edmund Beckett, Bart., LL. D., Q. C., F. R. A. S., Chancellor and Vicar General of York. Second edition, enlarged. London: Crosby, Lockwood & Co. 1880.

PLUMBING. A Text-Book to the Practice of the Art or Craft of the Plumber, with Supplementary Chapters upon House Drainage embodying the latest Improvements. By William Paton Buchan, Sanitary Engineer and Practical Plumber; Member of the Sanitary and Social Economy Section of the Philosophical Society of Glasgow, and Fellow of the Royal Scottish Society of Arts. Second edition, revised and much enlarged, with three hundred illustrations. London: Crosby, Lockwood & Co. 1880.

NOTES AND CLIPPINGS.

THE CATHEDRAL AT FLORENCE. — The front of the left wing of the façade of the Florence Cathedral has just been again covered with matting after having been exposed to the admiration of the Florentines for a fortnight. About one fifth of the façade is now completed, at a cost of rather more than 300,000 francs or £12,000, entirely collected by voluntary contributions. The work has been intrusted to the architect De Fabris, who has been ably assisted by a young architect of great promise, Signor Louis del Moro, who has bestowed his utmost care and attention on the work, which has given general satisfaction, and which is undoubtedly the most important in an artistic light which has been executed in Florence during the present century. The new façade harmonizes with the rest of the edifice, commenced at the time of the revival of art from the design of Arnolfo, which was afterward modified by the change introduced by Brunelleschi. Several figures in marble are placed over the entrance door; those sculptured by the talented Professor Paganucci are wonderful productions of art, they represent angels and the Apostles and greatly add to the beauty of the entire work. According to the historian Villani, the Florentines had at an early period determined to erect in their city a monument which should surpass all that had preceded it, and on Christmas Day, 1298, the foundations of the cathedral were laid, to which the name of "Santa Maria del Fiore" was then given. Between the period of the commencement of the edifice and that in which its completion was intrusted to Brunelleschi, many architects of eminence were employed in carrying on the works, such as Giotto, Gaddi, and Oragna. The façade subsisted till the sixteenth century, and was destroyed in 1588 by Benedetto Uguccioni for the purpose of reërecting it in the modern style. In 1636 another façade was begun, but the works were soon suspended and remained so till within three years. A subscription was got up during the time of the late government, at the head of which was the name of the Grand Duke, for restoring the façade, but no further steps were taken. — *Correspondence of the Geneva Continent.*

SANITARY CONDITION OF MEMPHIS. — The Memphis *Avalanche* is dissatisfied with the manner in which the city offal is disposed of. For several months it has been dumped in the river below the city, at a point where it was supposed the current of the Mississippi would sweep it away. Instead of that it has formed a bank close to the bank of the river, and though covered up now by high water, it will be laid bare and exposed to the hot sun when the summer stage of low water comes on. This removal of the city offal has been the principal precaution taken to improve the health of the city, and if it has failed there is very little chance of Memphis escaping another yellow fever infliction.

"IF I WERE PREFECT OF THE SEINE." — In the number of *Paris Murcie*, a journal produced with the aid of all the most eminent artists of France, and the large proceeds of which have been devoted to the sufferers by the recent inundations in Spain, M. Garnier, asked to contribute his mite to the general store, expresses his views, above his minute signature, in an article entitled "If I were Prefect of the Seine." "If I were Prefect of the Seine, instead of changing the names of the streets, which at a future time may be easily re-changed, I should make a series of good regulations which would have a chance of lasting a long time. Of your motto, of our motto, if you will, — you make great use of the word 'equality.' Take rather that of 'liberty,' and allow people to build after their fancies. Do not impose on architects maximums of height and projection, but leave to each the right of raising his building according to his convenience, and planting some moucharabis at the corner of his balconies. It will interfere less with the neighbors than the trees of the boulevards, which throw their branches into the windows. Instead of encouraging the fabrication of monotonous cages for lodgers, encourage on the contrary campaniles, gables on the street, marbles, enamel, and mosaic. In every case, if you do not feel you have the power to revive at Paris that desirable picturesqueness which I regret, at least do not follow the example of your predecessors by contributing to sweep away the little which remains. Color as well as form gives charm and movement, and if time gives to our monuments an harmonious patina, every pains must be taken to preserve it. Recall therefore that superannuated and deplorable decree that every house shall be scraped and cleaned every ten years, under the pretext that it is hygienic. Why are you not logical, and only carry out such an operation with private buildings? Scrape also Notre Dame while you are about it, and the Sainte Chapelle, and the Baths of Julian, and you will see the beautiful effect these buildings will present when you have taken off their skin. Architects are not pariahs, and they respect the works of their masters quite as much as other artists, and you would see what these latter would say if by prefectorial regulation, the Marriage of Cana, or the Venus de Milo, were scraped. But I am not Prefect of the Seine, and frankly I do not regret it. I prefer to be his friend, Charles Garnier."

A METALLIC WATCH-DOG. — Most persons are aware that, by introducing a flame of gas into an open tube, whether of metal or of glass, the tube will sound; in fact, we might easily produce singing flames. The sound, of course, differs according to the size of the tube, the force of the flame, etc. Sometimes the sound is like a roar, at others, like a low moan; sometimes high, sometimes low; in fact, the greatest variety of expressions can be produced according to circumstances. But better than this has been found. There are silent speaking-tubes; that is to say, tubes that, under ordinary circumstances, do not utter a sound; but, if a door be opened, a draught is created, then the glass vibrates, and the most startling noises result. A glass of this description has been contrived in which, when a jet of gas burns, the sound of a dog barking is produced should the street-door be opened. Thus may the house be guarded by a mechanical watch-dog!

THE BERLINESE SCULPTORS ON COMPETITIONS. — The Berlin sculptors have presented a memorial to the Ministry of Fine Arts, proposing to regulate the establishment of competitions in such a way that whenever the Government may ask for competitive designs the conditions imposed may not be, as is often the case at present, impracticable for the sculptors to agree to. If the artists in this country should join in proposing to the Government the regulation of the competitions for public monuments, after the manner of those held abroad, some good might result from it. The Berlin sculptors are aggrieved because they think the Ministry of Fine Arts is not sympathetic. American sculptors have all the reason in the world to deplore the utter absence of any national encouragement whatever. — *Boston Advertiser.*

THE DEMIDOFF SALE. — All the treasures in Prince Demidoff's villa near Florence are to be sold. Their estimated value is 4,000,000 francs. There are rare sculptures, masterpieces of the Dutch school, some of which cost from \$30,000 to \$50,000 each, — among them an unrivalled Jan Steen, The Family Musical Party, porcelains, bronzes, jewelry, tapestries, relics of the great Napoleon, hangings, embroideries, every species of bric-a-brac, gold and silver work, malachite and lapis-lazuli ornaments, sumptuous furniture, books, wines, carriages, the rare plants of the hot-houses, in short, the gatherings and caprices of a man of an untold income, good and bad, bought as a diversion or to kill time. The prince intends building a superb villa, and the design is to be open to the competition of architects of every country, with only one restriction; it must be in the style of Henry II. of France.

A RELIC OF THE THIRD VOYAGE OF COLUMBUS. — The *Moniteur* of Martinique prints an interesting story about the finding of an anchor belonging to the ship upon which Christopher Columbus sailed on his third voyage of discovery to the New World. On the night of August 1, 1498, says the *Moniteur*, the small fleet had come to an anchor at the southwestern extremity of the island of Trinidad, to which the navigator had given the name of Arenas Point. Washington Irving relates that Columbus, who was a very poor sleeper, suddenly heard a frightful noise, apparently coming from the south. Rushing on deck he saw rolling toward him a wave as huge as a mountain, which threatened to submerge the fleet. All hands thought their last hour had come; but the only damage sustained was the loss of one of the anchors of the admiral's ship. The big wave was caused by the sudden swelling of one of the rivers that empty their waters into the Gulf of Paria, the existence of which was unknown to the discoverer. The incident is mentioned in the narrative of the voyage bequeathed to us by Ferdinando, Columbus's son. This historical anchor has been found after all these centuries by Señor Agostino, the owner of Arenas Point. It weighs 1,100 pounds, and is of decidedly primitive form. Señor Agostino found it while making some excavations in his garden. This garden, upon careful measurement, appears to occupy the precise spot where rode the ships of the great mariner in 1498. The finder at first took his treasure trove for a Phœnician anchor, but upon attentive examination he found the date of 1497 on the stock.

BUILDING INTELLIGENCE.

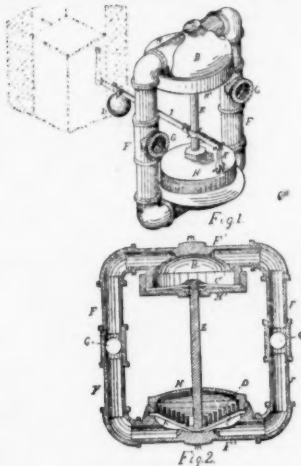
[Reported for the American Architect and Building News.]

[Although a large portion of the building intelligence is provided by their regular correspondents, the editor greatly desires to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

223,446. AUTOMATIC DAMPER-REGULATOR. — Florentine A. Jones, New York, N. Y. The object of this invention is to provide a simple means for automatically operating the damper of a steam-boiler furnace. The invention employs one or more diaphragms, in connection with springs arranged in steam-chambers, and actuated by steam pressure so as to raise or lower a connecting-rod, which moves a lever connected with the damper in the furnace-flue. A and B are two steam-chambers, connected with each other by the tubes F F, which are connected with the boiler by means of tubes attached to the openings G G or m m. In the chambers A and B are arranged diaphragms C C, secured by the caps H H. Within the chamber A is a valve spring, D, which presses the diaphragm C downward. To the centre of D is secured a connecting-rod, E, which is also attached at its upper end, to the diaphragm C in chamber B. To the rod E is pivoted a lever, I, connected at one end to the lower steam-chamber casing by means of hinged link K, as shown. The free end of the lever I is to be connected, by means of one or more levers, to the flue damper-rod. A weight, L, may be placed on the lever I, to accurately adjust the closing of the damper. For ordinary use one spring may be sufficient, but in case of very high pressure an additional spring may



be similarly applied to the upper diaphragm, C', in chamber B. In the application of the invention to boilers of very low pressure the diaphragm C and spring D in the chamber A are sufficient to actuate the rod E, and consequently the flue-damper, without the necessity of using the diaphragm C' in chamber B. In this case the upper portion of the device on a line with the openings G G may be dispensed with, the ends of the tubes closed, and steam be admitted to the chamber A through an opening made at m in the bottom of said chamber. The diameter of the diaphragm C is smaller than that of C' in chamber A, so as to expose a smaller area to the action of the steam, for the reason that if the surfaces exposed to the action of the steam were of the same area in both diaphragms the force exerted upon one diaphragm would be equal to that upon the other, and consequently produce no effect upon the connecting-rod. In operation, the steam enters the tubes F F by means of tubes connecting the openings G G with the boiler. The steam then passes into the chambers A and B, exerting its force on the diaphragm C upward and on diaphragm C' downward. As C presents the largest area, the pressure of steam on it will be the greatest, thus carrying up the connecting rod E and pressing up the diaphragm C'. Inasmuch as C cannot rise without compressing D, it follows that it will reach a point where the pressure downward of diaphragm C', aided by the resistance of spring D, will exactly equal the pressure upward of the diaphragm C. When the pressure of steam is reduced in the boiler it will be correspondingly reduced on the diaphragms; but the force of the spring D will remain the same, and will have the tendency to draw the rod E downward until it ceases to act, so as again, with the diaphragm C', to equal the pressure on C, thus actuating the connections to the damper and causing the latter to open or close as the pressure of the steam diminishes or increases.

224,775. IRON COLUMN. — William J. Fryer, Jr., New York, N. Y.

224,786. HANDLE FOR TOOLS. — Henry A. Moore, Texas, Ga.

224,789. SAW-SET. — Charles Morrill, New York, N. Y.

224,804. WINDOW-FASTENER. — Lorenzo Stebbins, Hinsdale, N. H.

224,814. DRYING-KILN. — Charles L. Campbell, Terre Haute, Ind.

224,818. WINDOW-FRAME. — Susan H. Decou, Centreville, O.

224,833. FASTENER FOR MEETING-RAILS OF SASHES. — Leander K. Lippincott, Washington, D. C.

224,837. CURTAIN-FIXTURE. — James Montgomery, Marshfield, Ill.

224,841. COMPOUND FOR REMOVING PAINT AND VARNISH. — William H. Nordaby, Germantown, N. Y.

224,867. MACHINE FOR DRESSING MOULDINGS. — John C. Brandon, Detroit, Mich.

224,873. CHIMNEY-CAP AND COWL. — Charles C. Caywood, Clarksburg, W. Va.

224,891. SASH-FASTENER. — Thomas M. Foster, Union City, Penn.

224,895. MANUFACTURE OF POTTERY WARE AND MORTAR. — John Fuhs, Washington Court-House, O.

224,900. ELEVATOR. — John A. Groshon, New York, N. Y.

224,901. HYDRAULIC ELEVATOR. — William E. Hale, Chicago, Ill.

224,908. METALLIC TENON FOR BLIND-SLAT. — Andrew L. Hill, Decatur, Ill.

224,912. LIME AND CEMENT KILN. — Benjamin F. Holland, Utica, Ill.

224,918. BLIND-SLAT RETAINER. — James J. Jardine, New Haven, Conn.

224,938. PAVING-TILE. — William J. Mitchell, San Francisco, Cal.

224,940. DOOR-CHECK. — Amant Meritte, Rouen, France.

224,945. APPARATUS FOR ILLUSTRATING THE RULES OF PERSPECTIVE DRAWING. — Frank O'Ryan, New York, N. Y.

224,962. PARALLEL-RULER. — Charles D. Sigbee, Washington, D. C.

SUMMARY OF THE WEEK.

Atlanta, Ga.

HOUSES. — Messrs. Perkins & Bruce have in hand houses for M. C. Kiser, J. T. Kiser, and Mr. Winship, which will cost respectively \$15,000, \$15,000, and \$10,000.

SOCIETY BUILDING. — Messrs. Perkins & Bruce are the architects of the new building for the Young Men's Library, which, at a cost of \$25,000, is now building.

STORE. — The same architects are also building a store for Judge Hillyer, which will cost \$8,000.

Baltimore.

BUILDING PERMITS. — The following building permits have been issued since our last report: —

German Savings Bank, three-story brick and stone building on Baltimore St., between Green and Pine Sts.

Johnstone Bros. & Co., 2 five-story iron-front warehouses, Howard St., near Lombard St., 30' x 80'.

Tilman & Haskins, three-story brick building, North St., between Eager and Chase Sts., 16' x 38'.

Florence Patterson, three-story brick building, Pratt St., between Gay and South Sts., 30' x 25'.

G. W. Ward, five-story iron-front warehouse, northeast corner Charles and Baltimore Sts., 50' x 70'.

B. & O. R. Co., seven-story brick and stone building, northwest corner Calvert and Baltimore Sts., 102' x 104'.

John King, Jr., 2 four-story brick and stone warehouses, Sharp St., between Lombard and Pratt, each 30 feet front.

ALTERATION. — Messrs. Wyatt & Sperry are preparing drawings for an addition to the residence of Mr. Geo. A. N. Moale, in Baltimore County, to cost about \$3,500.

BANK. — The Traders' National Bank has purchased the property fronting 23 feet on German Street, corner of Grant Street, running back to Mercer Street 75 feet, on which they propose to build a banking house.

SOCIETY BUILDING. — Mr. F. E. Davis, architect, is preparing drawings for a Biblical Institute, to be built on the corner of Edmonson Avenue and Fulton Avenue, 70 by 66 feet, three stories and basement, to be built of stone, and to cost about \$25,000.

WAREHOUSES. — Negotiations are now pending looking to the purchase of the property of the First Methodist Episcopal Church, on the northeast corner of Charles and Fayette Streets. It is designed to build on this site a row of fine warehouses. Purchasers are ready, but some of the members of the church are opposed to selling the property. The majority, however, are in favor of moving to some up-town location.

Boston.

BUILDING PERMITS. — Since our last report the building permits granted are as follows: —

Brick. — 347 Marlboro' St., for W. F. Whitney, 1 dwell., 20' x 55'; three stories; Standish & Woodbury, builders.

Bussey Place, Ward 10, for C. G. Chase, 1 store, 22' x 60'; five stories; D. H. Jacobs & Son, builders.

Cor. Fairfield and Newbury Sts., 4 dwells., 25' x 30', 23' x 40', and two 22' x 42'; Alden Avery, owner and builder.

225 Marlboro' St., for S. T. Ames and F. Whitwell, 2 dwells., 25' x 55'; three stories; E. C. Chapin, builder.

Wood. — P. St. Ward 14, for A. H. Emery, 1 dwell., 30' x 38'; three stories.

146 Condon St., for N. E. Pottery Co., 1 workshop, 27' x 80'; three stories; D. Damon, builder.

N. Beacon St., Ward 25, for H. B. Goodenough, 2 dwells., 21' x 31'; A. J. Needham, builder.

HOUSES. — Mr. W. Whitney Lewis is the architect of a house for Mr. F. J. Doe, on Commonwealth Avenue; McKenzie & Campbell, carpenters.

On Marlboro' Street is building a residence for Dr. W. F. Whitney, from the designs of the same architect; Morton & Chesley, carpenters; Standish & Woodbury are masons of both.

Drawings are also made for a house for Mr. Charles J. Blake, on Marlboro' Street.

PROSPECTS. — Building operations for January and February are forty per cent better than last year.

WAGES. — As help is coming from out of town, labor prices are not higher at present. When spring work begins a general rise will probably take place.

Brooklyn.

BUILDING PERMITS. — Morton St., 1 one-story brick machine-shed, 38' x 26'; owner, J. C. Keenan, 32, 34, and 36 Morton St.; builders, Parks & Koch.

Ten Eyck St., three-story brick factory, 45' x 94'; cost, \$9,000; owners, S. Waterbury & Co., on premises; architect, B. Coszine; builders, John McQuaid and Jas. Friesse.

Metropolitan Ave., No. 40, 1 three-story frame tenement, 25' x 50'; cost, \$3,400; owner, M. Ullers, Johnson Ave., near Ewen St.; architect, John Platte.

Graham Ave., cor. McKibben St., 1 three-story frame store and tenement, 25' x 55'; owner, C. F. L. Eichhorn, Myrtle Ave., near Broadway; architect, John Platte; builders, Ulrich Maurer and D. Kreuder.

Ten Eyck St., 1 three-story frame tenement, 25' x 50'; owner, Friedrich Specht, Ten Eyck St., near Ewen St.; architect, John Platte; builders, B. Rauth & Bro. and C. Weber.

Willoughby Ave., 3 three-story brick dwells., 20' x 42'; cost, each, \$6,000; owner, P. F. O'Brien, 164 Bedford Ave.; builders, Ashfield & Sons.

Carlton Ave., 3 three-story brown-stone dwells., 16' 8" x 45'; cost, each, about \$6,000; owner and builder, Thomas Fagan, Grand Ave., near DeKalb Ave.; architect, Robert Dixon.

Cleveland.

APARTMENT-HOUSE. — An apartment-house is to be built for W. B. Hale, on Lake Street, of brick and stone, four stories in height, 23 by 77 feet, containing 85 rooms; cost, about \$8,000; B. S. DeForest, architect.

HOUSES. — Messrs. Cuddell & Richardson are preparing plans for Mr. Feideman for a two-story frame summer residence on Lake Avenue; cost, \$8,000.

A four-story brick block of five dwellings is to be built for Mr. I. M. Hubby, on the corner of Haywood and Sibley Streets, at a cost of about \$25,000.

Also, a block of two dwellings on Prospect Street, near Case Avenue. The front is to be of Amherst stone, and to cost about \$20,000. Mr. Joseph Ireland is the architect of both.

Messrs. Heard & Smith, architects, are engaged on a number of fine residences, the principal one being for Mr. Wilson Dodge, on Dodge Street, three stories high, 28 by 70 feet, to be entirely of Amherst stone; cost, about \$20,000.

Messrs. Coburn & Barnum have a number of very fine residences on the boards, of which a two-story frame dwelling for Mr. L. A. Hall, on Dunham Avenue, is the leading one: 40 by 80 feet; cost, \$5,000.

Messrs. Blackburn & Charlott, architects, are to build a two-story frame house for Mr. Chamberlain, on Madison Avenue, at a cost of \$5,000.

SEMINARY BUILDING. — Messrs. Cuddell & Richardson, architects, have a large number of buildings on hand, the principal one being a large addition to the Notre Dame Seminary, corner of Superior and Huntington Streets. To be of brick and stone, four stories in height, 46 by 88 feet; cost, \$15,000.

STORES. — Mr. Levi T. Scofield, architect, is busily engaged on the fine new block for E. M. McGillin & Co., on the corner of Superior and Seneca Streets. The building will be 40 by 150 feet, to be built of Philadelphia pressed brick, with red terra-cotta finish; probable cost, \$25,000.

It is also preparing plans for a number of buildings and dwelling-houses.

Messrs. Blackburn & Charlott are preparing plans for a three-story brick block, 30 by 90 feet, to be built by Mr. M. L. Shay, on Pearl Street.

New York.

BUILDING PERMITS. — One Hundred and Eleventh St., 8 four-story brick tenements, 25' x 60'; J. M. Meehan, owner; Andrew Spence, architect; H. Meehan, builder; cost, \$72,000.

Fourth Ave., cor. Fifty-eighth St., two-story brown-stone front stable, 25' x 100'; William Van Antwerp, owner; Joseph Smith, builder; cost, \$6,500.

Fifty-second St., 3 stables and dwells., 37' x 100' 5", 25' x 100' 5", and 37' 6" x 100' 5"; Montrose blue-stone fronts; W. S. Gurney and D. O. Mills, owners; Charles Buck, architect; cost, \$47,000.

Third Ave., brick foundry, 70' x 125'; for F. L. Mott Iron Works; Thos. McAvory, architect; N. P. Dunham, builder.

Eightieth St., for Edward Clark, 1 brick dwell., 45' x 10'; Jno. Banta, builder.

One Hundred and Twenty-sixth St., cor. Madison Ave., 1 brown-stone dwell., 20' x 50'; cost, \$12,000; J. H. Valentine, architect; W. B. Birdsall, owner and builder.

One Hundred and Twenty-sixth St., 5 brown-stone dwells., 18' x 50'; cost, \$50,000; J. H. Valentine, architect; W. B. Birdsall, owner and builder.

ALTERATIONS. — Avenue C, No. 137, four-story brick store and tenement, two-story brick extension, 20' x 17', and new front to be put in first story; cost, \$1,800; owner, Morris Osterweis; carpenter, Guy Culgin; mason, Richard Shapter.

Forty-fifth St., two-story brick fat-rendering house, one-story brick extension, 25' x 17'; cost, \$1,500; owners, East Side Rendering Association; architect, George Brown; builders, Murphy & McIntyre.

Centre St., No. 138, five-story brick store, one-story brick extension, 19' x 38'; cost, \$1,500; owners, Lorillard Estate; mason, E. Anderson.

Front St., No. 4, five-story brick warehouse, to be fitted up as offices and storerooms for L. R. R. Co.; cost, \$8,000; owners, N. Y. E. R. R. Co.; builders, Klappert & Sons.

Front St., No. 5, five-story brick store and factory, an additional story; cost, \$2,000; owner, Rufus Story, 7 Front St.; masons, Van Delsol & Arnott.

Wall St., No. 33, five-story brick office building, interior alterations; cost, \$1,800; owner, Mechanics' National Bank, on the premises; architects, O. P. & R. F. Hatfield; builders, A. A. Andrus & Sons.

Fifth Ave., cor. One Hundred and Twenty-fifth St., brick church and chapel reconstructed; cost, \$65,000; owners, Rector and Vestry of Holy Trinity Church, 41 West One Hundred and Thirtieth St.; architect, Geo. W. Debevoise.

First Ave., No. 1611, four-story brick tenement and store, one-story brick extension, 13' 4" x 24'; cost, \$1,100; owner, Nicholas Schumacher, 1083 First Ave.; architects, Thom & Wilson.

Chrystie St., No. 181, four-story brick tenement and stable, interior and exterior alterations; cost, \$2,200; lessee, Bernhard Breder, on premises; architect, F. W. Klome.

Sixty-sixth St., No. 46 E., four-story brick dwell., four-story brick extension, 15' x 38'; cost, \$7,500; owner, Mrs. L. N. Yelverton; architect, James E. Ware; builder, A. Shipman.

Pearl St., No. 323, five-story printing establishment, walls to be raised; cost, \$4,400; owners, Valentine & Co.; architect, Edward E. Rabi; masons, Peter T. O'Brien & Son; carpenters, W. Germond & Co.

Eighth Ave., Nos. 851 to 859, 5 four-story brick stores and dwells., new store fronts to be put in first story and interior alterations; cost, \$3,500; owner, Wm. T. Walton, 803 West Fifty-first St.; architect, Daniel Burgess.

Broad St., No. 29, four-story brick office building, interior alterations; cost, \$10,000; owner, D. Parrish; architect, Wm. W. Gardiner.

Forsyth St., No. 35, three-sty frame and brick store and dwell., to be raised three feet, a one-sty brick extension, 25' x 34', and internal alterations; cost, \$6,000; owner, Bernard Bourke; architect, Julius Boeckell.

Eleventh St., No. 38 East, two-sty and attic brick dwell., to be made five stories, to be extended on rear 16' x 53', and to be connected with adjoining hotel; cost, not estimated; owner, A. S. Rosenbaum; architect, Henry Fernbach.

CHURCHES.—The Church of St. Leo is to be built on lots Nos. 11 and 13 East Twenty-eighth Street, from designs of Mr. L. J. O'Connor; it will cover 50 by 100 feet; to be in the Gothic style with octagonal turret. The nave will be 31 feet broad and 56 feet high, the roof open-timber. The exterior front wall probably be of Newark rubble-stone with Plainfield-stone finish. The cost is estimated to be about \$40,000.

Mr. O'Connor is also preparing plans for the Church of St. Lawrence, with school and pastoral residence, which will be built at a cost of about \$250,000. The church will be in Gothic style, and will be built of stone, with granite or Lockport limestone finish. The school and residence will be of brick, with same finish as church.

Factories.—A large factory is to be built on One Hundred and Sixth Street, for Messrs. Nathan & Dreyfus, and on the corner of Columbia and Stanton Streets one is to be built from designs of Mr. W. Wheeler Smith; Mrs. Miller, owner.

Houses.—On the north side of Seventy-ninth Street, between Fifth and Madison Avenues, Messrs. Squire & Woolley propose to build six first-class houses.

Office Building.—No. 55 Broadway is to be rebuilt from designs of Mr. Walter Cook.

School-House.—The city proposes to build a new school-house on Sixty-first Street, between Second and Third Avenues.

Stable.—At 115 West Twenty-fourth Street, a stable is to be built for Mr. Henry Maillard; Mr. Jas. E. Ware, architect.

Store.—No. 414 Grand Street is to be rebuilt as a store. It will be four stories, with basement, of brick, with Ohio-stone finish, and will cost about \$12,000; Mr. L. J. O'Connor, architect.

Tenement-House.—The Lorillard Estate Trustees have decided to build, at the corner of South Fifth Avenue and Spring Street, in place of the stable previously reported, a tenement-house, the first floor to be used as a store. The lot is 25 by 93 feet.

Philadelphia.

Factories.—Broad, cor. Spring Garden St., 1 three-sty office and factory building, 45' x 116'; owners, the Baldwin Locomotive Works; architects, Wilson Bros. & Co.; contract not yet awarded.

Leverington Ave., between Chestnut and Hamilton Sts., 1 three-sty factory, 60' x 140'; contractor S. S. Keely; cost, not given.

Cannilla St., between Eleventh and Twelfth Sts., 1 four-sty factory, 47' x 127'; owners and builders, Campbell & Elliot; cost, not given.

Houses.—Fifteenth, cor. Ellsworth St., 1 three-sty dwell., 18' x 42'; builders and architects, D. Henon & Son; cost, \$4,000.

Hancock St., north of Cumberland St., three-sty brick dwell., 18' x 55'; owner, Wm. McGeorge; cost, about \$5,000; contract not yet awarded.

Providence.

Alteration.—The building at the corner of Westminster and Clemence Streets, the interior of which was recently destroyed by fire, is to be remodelled in accordance with plans prepared by Mr. Fred Pope, of Boston. The store front will be rearranged, and a one-story addition, 38 by 72 feet, made at the rear of the building.

House.—Mr. Hiram B. Aylesworth is building a two-story and French roof frame building on Wesleyan Avenue. W. H. Colwell is the architect.

St. Louis.

Building Permits.—Forty-four permits have been issued since our last report, of which eleven are for frame structures of slight importance. Of the rest, those worth \$2,500 and over are as follows:—

Owners.	Use.	Stories.	Rooms.	Cost.
E. B. Brown.	Warehouse.	2	2	\$9,000
Dodd, Brown & Co.	Warehouse.	3	3	7,500
F. A. Witte.	Store.	4	4	7,000
F. W. Hincke.	Dwelling.	2	6	4,000

General Notes.

ATLANTIC CITY, N. J.—Messrs. Wilson Bros. & Co., architects, of Philadelphia, have just completed plans for a depot for the Pennsylvania Railroad Company. The new route is expected to be open for travel by May 15.

BAYN MAWR, PENN.—Taylor College, three four-story buildings (stone and fire-proof), one building 78 by 130 feet, one 54 by 100 feet, one 48 by 128 feet; architect, Addison Hutton; contractors, the owners; cost, not known.

CAMDEN, N. J.—One two-story and basement weaving and spinning-mill (brick), 61 feet 6 inches by 122 feet 6 inches, with two-story engine-house, 28 feet 2 inches by 25 feet, and two-story boiler-house, 22 by 33 feet, and wash-house, 18 by 30 feet, with one 80 horse-power buckeye engine, two 100 horse-power boilers; owner, Richard Williamson, Esq., Philadelphia; architect and engineer, W. H. Geissinger, of Philadelphia; contractor, John S. Steele; cost, \$30,000.

COLCHESTER, CONN.—The selectmen have been authorized to rebuild the almshouse burned last summer, and \$2,500 has been appropriated for that purpose.

COVINGTON, KY.—Mr. Edwin Anderson, architect, of Cincinnati, is building houses for Mr. Hart and one for Mr. John E. Orr.

CUMBERLAND, MD.—Mr. Adler, of Baltimore, is putting up a large store here, 23 feet front by 109 feet deep, three stories high, to be of brick and stone; cost, \$8,000. Mr. F. E. Davis, of Baltimore, is the architect.

DASSEL, MINN.—The Swedes are thinking of building a new church.

ESSEX, O.—The plans and specifications for the new West End Primary School Building have been accepted by the Board. The building is to accommodate 450 pupils.

FRANKLIN, IND.—Surveyors have laid out the ground for 14 starch works, and work will be commenced in a few days. They will cost about \$50,000.

GADSDEN, ALA.—Messrs. Perkins & Bruce, architects, of Atlanta, Ga., are building a hotel here which will cost \$30,000.

HOBOKEN, N. J.—For the Hoboken Ferry Company some new ferry buildings are being built from designs of Messrs. Gambrell & Ficken, of New York. They are in the Queen Anne style, and of elaborate construction.

IRONTON, O.—Mr. Edwin Anderson, of Cincinnati, is the architect of the new office building of Hiram Campbrell & Sons.

Mr. Anderson is also building a house for Mr. W. S. Kirker.

LONG BRANCH, N. J.—A cottage measuring 50 by 70 feet, together with a stable, is now building for Mr. Amos Cotting, of New York, from drawings of Mr. W. W. Lewis, of Boston, architect. A considerable quantity of face brick and terra-cotta is employed both outside and inside. R. V. Brees, builder; cost, \$24,000.

LOOGOTEE, IND.—The contracts for St. John's Church are ready for letting by the architect, Mr. A. Druiding, of St. Louis, Mo.

LOUISVILLE, KY.—H. C. McDowell, one-sty store on Green St., between Fourth and Fifth; cost, \$3,150.

R. A. Robinson, four-sty stone and brick store on Fourth St., between Jefferson and Market; cost, \$10,000. The Newcomb-Buchanan Company, two-sty frame house, cor. Main and Johnston Sts.; cost, \$1,000.

MANCHESTER, N. H.—This city is to build a school-house 22 by 63 feet and two stories high, to cost \$4,800.

MARBLEHEAD, MASS.—Mr. W. Whitney Lewis, of Boston, is the architect of two houses at Peach's Point, for Dr. Whitney and Mr. Sidney Burgess. They are now ready for plastering, and will cost \$5,000 apiece. A. Roscoe is builder of both.

MENEAUNE, WIS.—The contemplated Sawyer Mill will soon be built here. The timbers are ordered, and a mill costing from \$35,000 to \$40,000 is determined on.

MIDDLEBURY, O.—The plans for the new city buildings are now open for inspection. The work will begin at once.

NATCHEZ, MISS.—A yarn mill 48 by 160 feet is building here. New Bedford, Mass.—Messrs. Hammond & Sons are the architects of the two-story brick store building for Hawes, Macomber & Homer, on Acushnet Avenue; cost, \$15,000.

NEW HAVEN, CONN.—Plans for a Seaman's Bethel at Belle Dock are prepared, and \$1,100 have been raised.

NEWPORT, R. I.—John T. Bush is having a \$6,000 house built on upper Ayrault Street.

NORTH ATTLEBORO, MASS.—Messrs. Kenyon, Whitaker & Smith are building a Queen Anne cottage for Mr. H. F. Barrows. Walker & Gould, of Providence, R. I., are the architects.

OAKLAND, CAL.—The new work that has been started since the 1st of January is as follows:—

Brick, stores and offices; E. Hook, owner; J. C. Mathews & Son, architects; three stories, 100' x 45'; \$20,000. Frame, dwelling; P. Thomson, owner; J. C. Mathews & Son, architects; two stories; \$4,500. Frame, dwelling; Haskell & Smilie, owners; J. C. Mathews & Son, architects; two stories; \$2,500. Frame, dwelling; T. Delger, owner; J. C. Mathews & Son, architects; two stories; \$5,000. Frame, dwelling; Mr. Plaw, owner; Wm. Smith, architect; one story; \$5,000. Frame, three tenements; W. Naegle, owner; T. Welch, architect; one story; \$4,200. Brick, Masonic Temple; Masons, owners; Wright & Sanders, architects; three stories, 105' x 64'; \$75,000.

It is anticipated that Flood, O'Brien, and other San Francisco millionaires will build here this year.

OCEAN GROVE, N. J.—Mr. J. Ireland, of Cleveland, is the architect of the summer hotel building for H. Martin; cost, \$5,000.

OMAHA, NEB.—The contracts for the Church of the Holy Family are ready for letting by Mr. A. Druiding, architect, of St. Louis, Mo.

OTTUMWA, IO.—Mr. C. A. Dietrich, architect, has the following work on hand at present:—

Two store buildings for A. P. Peterson; cost, \$5,000. One dwelling for B. F. Hyatt; cost, \$2,500.

Additions to residence for J. W. Edgerly; cost, \$2,000.

PAWTUCKET, R. I.—Mr. Geo. H. Fuller is about to build a jeweller's shop. The architects are Messrs. Stone & Carpenter, of Providence. Contract for the mason's work awarded to Patrick Farrell; the carpenter's work to Kenyon, Whitaker & Smith; cost, \$10,000.

Littlefield Brothers are making a large addition to their mill, at a cost of about \$12,000; mason's work, Charles Dean; carpenter's work, French, McKennie & Co.; Walker & Gould, of Providence, are the architects.

Mr. Daniel Wilmarth is now building a dwelling-house for Mr. Smith Grant, on Broad Street; Walker & Gould, architects, Providence, R. I.

Messrs. Stone & Carpenter, of Providence, R. I., are the architects of a new two-story dwelling now building on Summit Street for Mr. Cottrell.

Land has just been purchased for the new freight depot of the Providence & Worcester Railroad.

PEORIA, ILL.—The building committee has been ordered to advertise for plans for the Ninth Ward School-House, not to cost more than \$12,000.

POPOLIS, ILL.—Mr. A. Druiding, architect, of St. Louis, Mo., is ready to let the contract for building the new Church of St. John.

PITTSBURGH, PENN.—Miller, Metcalf & Parkin, of the Crescent Steel Works, are building a two story brick addition, 34 by 64 feet, to their warehouse.

PITTSFIELD, MASS.—W. F. Milton, of New York, has had plans made for a house in the Queen Anne style, 34 by 51 feet, the first story of brick and the second of wood, finished throughout in hard wood.

PORTLAND, ORE.—Messrs. Clark & Upton are the architects of the two-story brick addition now making to the Norton House; cost, \$13,000.

RADNOR, PENN.—One stone dwelling, 52 by 64 feet; owner, Hon. J. Clark Hare, Philadelphia; architect, Allen Evans, of Philadelphia; contractor, G. W. Eusinger; cost, \$12,000.

RIDGEFIELD, CONN.—At a town meeting last week it was voted to appropriate \$5,000 for a site for a State Insane Asylum, provided the State will locate an asylum here.

RUTLAND, VT.—The Sutherland Falls Marble Company is erecting a new building 280 feet long.

SALEM, O.—Mr. A. Kohler, of Cleveland, is the architect of the two-sty brick school-house; cost, \$13,000.

STOUT CITY, IO.—Mr. G. G. Baldwin is the architect of the two-story brick store building at the corner of Pearl and Third Streets; cost, \$7,000.

SPRINGFIELD, ILL.—The Aetna Flouring Mill, which was near the centre of the city, and which blew up on the

30th of December last, is to be rebuilt farther from the centre of business.

Another large extension is to be made to the Springfield Watch Factory the coming summer.

STRACUSE, N. Y.—Mr. Archimedes Russell is the architect of the three-story brick school-house now building on North Salina Street for the Church of the Assumption; cost, \$18,000.

A four-story brick house is building on Gifford Street, for C. Cork, Esq., by Mr. A. L. Merrick; cost, \$8,000.

TERRE HAUTE, IND.—J. J. Bauer will build, on Main Street, a three-story stone-front building in the spring.

TOLEDO, O.—Mr. N. B. Bacon is the architect of a two-story brick house on Superior Street; cost, \$5,500.

TORONTO, CAN.—It is said that the government architect has prepared plans for public buildings in this city which will cost half a million dollars.

TRUCKEE, CAL.—The new round-house is to have twenty-two stalls, each capable of holding two engines. Work will begin in June.

UKIAH, CAL.—The Mendocino County Court-House is to be enlarged.

WESTCHESTER, PENN.—One pressed brick and timber cottage, two stories and mansard, 50 by 58 feet; owner, Miss M. R. Thomas, Philadelphia; architect, Frank Furness, of Philadelphia; contractor, W. H. Burns; cost, \$10,000.

WESTFIELD, MASS.—The Athenaeum directors are figuring how to enlarge the capacity of the building, but have about concluded that nothing can be done except to build an addition, and for that from \$5,000 to \$10,000 will be required, which some public-spirited citizen can have the opportunity of donating.

XENIA, O.—It is reported that there are to be built a \$40,000 school-house, a \$10,000 improvement on the city building and a \$10,000 work-house.

Public Buildings.

BALTIMORE, MD.—Petitions from various officials and bodies of citizens, praying for the establishing of a new marine hospital, have been referred to the Committee on Public Buildings and Grounds.

GOOSE HILL FLATS, VA.—The Committee on Commerce has before it Mr. Johnston's bill to establish a light-house on Goose Hill Flats on the James River.

JACKSONVILLE, FLA.—The Committee on Public Buildings and Grounds has reported an amended bill to provide for building a public building in this city.

LOUISVILLE, KY.—The Committee on Appropriations has before it Mr. Willis's bill, making an appropriation to repair the post-office and custom-house building.

NARRAGANSETT, R. I.—The Committee on Commerce has reported a bill to build a light-house on Whale Rock, at the entrance of Narragansett Bay.

NEW ALBANY, IND.—Hon. Geo. A. Bicknell has introduced a bill appropriating \$150,000 for a government court-house and post-office in this city.

TOLEDO, O.—Mr. Thurman's Senate Bill to provide for the construction of a public building has been referred to the Committee on Public Buildings and Grounds.

WASHINGTON, D. C.—The Committee on the District of Columbia has before it an amended bill to provide a site for a union depot in this city.

The Committee on Public Buildings and Grounds has reported a bill to enlarge the city hall.

Bids and Contracts.

BALTIMORE, MD.—Messrs. Wm. T. Markland & Bro. have been awarded the contract for two four-story warehouses on Sharp Street, at \$48,800.

CHICAGO, ILL.—The contract for electric bells and speaking-tubes in the new court-house has been given to the Heiler Electric Company, of St. Louis, for \$2,625. The contract for marble tiling to the Burlington Manufacturing Company, for \$18,989. The same company also received the contract for marble wainscoting, at \$44,988. The contract for the brick, masonry, and iron-work was awarded to P. J. Sexton, for \$16,849.

EMMETTSBURGH, IO.—The contract for building the new court-house for Palo Alto County, B. J. Bartlett, architect, of Des Moines, has been awarded to D. E. Burdick, of Des Moines. Messrs. Bailey & Greenwald, of Milwaukee, Wis., have the contract for the jail work; and the Diebold Safe and Lock Company has the contract for the vault doors.

FALL RIVER, MASS.—The contract for furnishing the window frames and window sashes for the new United States Custom-House has been awarded to James M. Adams, for \$2,800.

JOLIET, ILL.—The contract for building a new poor-house for this county has been awarded to William Werner, of Joliet, for \$4,683.

LONG BRANCH, N. J.—The contract for the extension of the Ocean Pier has been awarded to the National Construction Company, of New York city, for \$40,000. The extension will be about 200 feet in length and 50 feet in width.

INDEX OF CURRENT WORK, Giving information concerning important buildings now unfinished.

[Architects and Builders are requested to aid the editors in making the information in this department full and exact. Notice of the completion of a building is particularly desired.]

Baltimore.

RAILROAD OFFICE.—Office for Baltimore & Ohio R. R. E. F. Baldwin, architect. Cost, \$400,000. 214 x

Boston.

STORES.—Liberty Building. W. G. Preston, architect. Cost, \$200,000.

HOTEL.—Hotel Vendôme. Ober & Rand, architects. 216 y

Brooklyn.

HOSPITAL.—Eastern District Dispensary and Hospital. C. C. Buck, architect. Cost, \$35,000. 204 y

HOSPITAL.—Hospital of St. Mary. Mr. P. C. Keely, architect. Cost, \$200,000.

Chicago.

HOTEL.—Hotel T. V. Wadskier, architect. Cost, \$30,000. 215 a

ASYLUM.—Home for the Aged. Cost, \$25,000.