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THE *Spectator* has something to say in regard to the recent fires which have destroyed three theatres in New York—the Park, the Windsor, and the Standard. As it well says, the burning of these buildings at times when they were not occupied by audiences is a signal good fortune for the city. Both at the Park and the Standard a few workmen were in the theatre; in neither of them could the private fire-alarm be made to work; and in both the flames spread so rapidly that at the Park Theatre one of the workmen was burned to death, and at the Standard another would have been burned if the firemen had not rescued him just in time. At the Windsor, the servants of the theatre, who slept in the building, barely escaped. If, then, as the *Spectator* says, a few persons in each theatre, familiar with all its by-ways and passages, could with difficulty escape with their lives, how could an audience hope to reach the street without being decimated by the flames? In none of the three theatres was the route from the auditorium to the street sufficiently free from obstruction to prevent choking in case of panic; and frightful loss of life must have followed the breaking out of fire during a performance. What makes the occurrence of these fires all the more noteworthy is, that New York is not only guarded by a very efficient Building Bureau, which had already struggled long and hard with the proprietors both of the Standard and the Windsor Theatre, but has at different times passed through seasons of agitation, during which visits, both amateur and official, have been made to all the theatres, with the view of "compelling obedience to the municipal regulations for preventing fires." To the ordinary mind it seems either that the municipal regulations on the subject cannot be very efficient, or that the proprietors of some of the theatres find it convenient to forget them as soon as the inspector's back is turned. The *Spectator* itself suggests that theatres should be placed among un-insurable buildings, until a radical change is made in the methods of constructing them. At present, the losses on such edifices far exceed the premiums received, and the insurance companies, by refusing to write policies on them, would do themselves, as well as the public, a great service.

THE mystery of the causation of malaria seems to increase with the progress of investigation instead of diminishing. According to Colonel Waring, who speaks from a thorough practical knowledge of the subject, the work of reclaiming the marshy land in the lower part of the city of Washington is most likely to add to the amount of malarial disease in the vicinity, in place of converting the whole region into the salubrious district which the imaginations of the promoters of the enterprise pictured to them. Colonel Waring's view is supported by the observations of many others, who contributed from their experience to the discussion which took place at the recent meeting of the Public Health Association at Detroit. A physician from New Orleans mentioned a fact often previously stated, that there is little or no malaria from swamps

overflowed with water; but that the evaporation of the water in dry seasons is always the precursor of serious epidemics. Dr. Wight, the well-known Health Officer of Detroit, testified that the draining of swamps was, in his opinion, generally followed by an increase of malaria in the neighborhood, but that as time went on, and the ground in the swampy district became thoroughly dry, the malaria disappeared. Another physician from South Carolina mentioned the curious circumstance that malaria did not appear in that State until the ground was cleared for cultivation. This coincides with the evidence gathered some years ago by the commission which investigated the climate of Staten Island, in New York harbor; all of which went to show that in thirty years, by the effect of gradual settlement and clearing, this beautiful island, from a perfectly healthy farming region, had become subject, in all except the thickly-settled and well-drained portions, to malaria, which, although not very severe in type, was practically permanent.

A DELIGHTFUL picture of the state of certain tenement-houses in Brooklyn is given in the report of a case which occurred in that city, where the serious or fatal illness of four children in one family called the attention of an enterprising reporter to the condition of the place in which they had lived and died. The family, which was that of the janitor of a house in North Seventh Street, lived in apartments in the basement of the building, two feet below the level of the street. The rooms, which have a rotten floor, under which is a stagnant pool, are infested with snails, which crawl over the furniture and into the beds of the occupants. The poor janitor, with some of his neighbors, whose homes were afflicted with similar vermin, attributed the death of his children to the poisonous bite of the "creatures with horns," which they were not able to avoid. It is needless to say that the physician in attendance did not accept this theory of the disease, which seemed to him simply the result of blood-poisoning from the foulness of the atmosphere in which his patients lived, but the circumstance well illustrates the wretchedness of the habitations which the poor in great cities are obliged to live in.

MR. J. L. SMITHMEYER, the architect of the intended building for the Congressional Library, has published a little pamphlet containing an account of the various competitions for the design of the building, as well as a review of the paper of Mr. William F. Poole, of Chicago, upon the construction of library buildings, which excited so much comment in and out of the profession some years ago. Mr. Smithmeyer's criticism of this paper is well-considered, and is certainly effective in many points, showing conclusively that Mr. Poole's model plan is anything but an economical one, either in first cost or in the expense of administration, while it fails in its provision of light. For small libraries there are probably advantages in Mr. Poole's arrangement, but for the peculiar requirements, at least of the Congressional Library, it would be, as we have before suggested, quite unsuitable. In speaking of his investigations into the necessary conditions of library constructions, Mr. Smithmeyer makes the remark, which should be remembered by all young architects, that the first consideration in such buildings should be light, the second, heating and ventilation, and the third, security against fire and dampness. All other points, important as they may be, must be regarded as subordinate to these. It is gratifying to have some of the observations of one so competent to make them put in a form to be useful to the profession, and we are only sorry that Mr. Smithmeyer should not have made his book larger. If, as seems likely, his design for the new building should be speedily carried out, we hope that he will collect the special knowledge which he has acquired, or may acquire during its progress, in a permanent work, for the benefit of his fellow architects.

SOME of the New York papers, and particularly the *Sanitary Engineer*, have been doing an excellent work in calling attention to the more glaring hygienic defects in the school-houses of that city. To the *Sanitary Engineer* is due the honor of having been the first to take up the cause of the helpless children, and several detailed reports of the condition of individual school-houses have been published, which show that damp cellars and foul odors are the rule among them. An

examination of school buildings has been made by the inspectors of the Board of Health, who are thoroughly competent to judge of their condition, as well as to decide upon the best mode of improving it, but the suggestions of these officers have been almost entirely disregarded, and their reports have been suppressed, the representatives of some of the daily papers having been refused access to them. The *Sanitary Engineer* advises those who desire to learn the actual condition of the buildings to apply to the courts for a mandamus to compel the production of the reports, which are unquestionably public property. We trust that some one will have the energy to do this, and to continue the exposure of defects until they are remedied. The methods of planning, building, heating, lighting and ventilating school-houses now almost universal in our great cities are simply disgraceful. The people of the United States are rich enough and intelligent enough to give all their children, if they wish, the best moral, physical and intellectual training that the world can provide; and in place of this they content themselves, in many cases, with cramming them by thousands, during the whole of their school life, into structures which would not be tolerated for a day in a similar English, French or German school district, and in which moral and physical health are alike impossible.

THE *Deutsche Bauzeitung* mentions a catastrophe which recently occurred in Berlin, where a large part of the cornice of a house in the Charlotten-strasse fell into the street, and calls attention to the danger of constructing such projecting features out of plaster, as is often done there. Every one knows that stone is a costly material in Berlin, and that most of the buildings, even of a very elaborate character, are constructed of brick, covered with stucco, and adorned with sculptured and moulded decorations, beautifully executed in plaster or cement. The temptation to give effect to such ornaments, especially when situated at the top of the building, by giving them the greatest projection that the tenacity of the material will permit, is very strong, and the *Deutsche Bauzeitung* mentions another instance of the fall of a cornice, and still another, of a house in which the entire facing became in the course of a year so loose that the building inspectors ordered it removed. The remedy for the danger to which the desire for securing effect in unreliable materials exposes the public seems to lie in restricting by law the projection of all cornices or string-courses in plaster. In Paris, as it seems, which enjoys a much milder climate than Berlin, and where plaster of the very best quality is used with much skill, the projection of any portion of the façade of a building, not of solid stone, more than six inches from the general surface of the front, is absolutely forbidden.

THE new façade of the cathedral of Florence is so far completed that the screens have been removed, and the work exposed to view. The death of the architect who designed the front, the late Signor de Fabris, seems to have allowed a doubt to enter the minds of persons of taste as to the mode in which the upper portion should be terminated, and one reason for the suspension of operations is said to be the desire for an expression of public opinion on the question. The design of de Fabris followed the well-known mode of the Tuscan Gothic, in completing the façade by three gables, which, although false in construction, since they are only screens, are characteristic of the style. The sharp lines of the gables will, however, it is feared, interfere with the curves of the great dome over the crossing of nave and transept, and a substitute is proposed in the shape of what a correspondent of the *Builder* calls a front in the "Basilican style." We must confess an ignorance as to the particular characteristics of a front in the "Basilican style," but for the information of the Florentine public a wooden structure has been erected on top of the completed portion of the façade, one-half of which represents the gabled termination as originally designed, while the other shows the Basilican outline. The relative merits of each being thus vividly set before the citizens, a vote by ballot is now being taken to discover the public preference.

LE GENIE CIVIL quotes from a paper recently read by M. Schelle a succinct comparison of the railways of the world. Divided in such a way as to show the number of miles of road in each country in proportion to the population, M. Schelle's statistics show that the people of the United States are far better supplied than those of any other part of the world, every

ten thousand of them having the use of thirty kilometres of railway, while the same number of inhabitants in England have only eight kilometres, in France and Germany seven and one-half, in Austria five, and in Russia three. In proportion to territory, however, the United States has the smallest service of any country included in the statistics, possessing only two kilometres of line to the square myriametre of surface, while Austria has twice and England nearly five times as much. It is a little singular that in the United States, notwithstanding the proverbial love of travelling which afflicts our people, the number of cars appropriated exclusively to the transportation of freight is far larger, in proportion to that of passenger cars, than in France, although the ratio of coastwise to inland traffic is probably not very dissimilar in the two countries. In France, according to M. Schelle, seven thousand locomotives are in service, with sixteen thousand passenger cars, and one hundred and eighty thousand freight cars; while the business in the United States requires eighteen thousand locomotives, thirteen thousand passenger cars, and five hundred and forty thousand freight cars. As most persons know already, the greatest speed is attained in England, where the Scotch express runs regularly at the rate of fifty miles an hour. The train next in swiftness is the New York and Philadelphia limited express, which accomplishes ninety miles in two hours. None of the French trains quite equal this speed. In regard to the cost of railway construction, it appears that the English lines cost, on an average, about four times as much as the American; the French about three times as much, and the German about twice as much. The Austrian lines are more expensively built than those of North Germany, and cost nearly as much as the French. Although the ratio of operating expenses to receipts is greater in the United States than anywhere else, the average of profit, including lines which are operated at a loss, as well as those which pay dividends, is also larger, and while the average for profits for the whole world is only about four per cent upon the capital, the American railways, as a whole, pay five per cent.

AFTER a considerable season of threatening and recrimination, a definite agreement has been made between M. de Lesseps, representing the Suez Canal Company, and the English merchants who professed to be on the point of constructing another canal from the Mediterranean and the Red Sea, for their own use, at a point, and with the aid of financial resources, which they wisely refrained from specifying. As the Suez Canal Company would probably have been able to prevent the success of any attempt at establishing a rival line, if such should be seriously made, M. de Lesseps might safely have disregarded the abuse which was showered upon him from the other side of the Channel; but being a man of good feeling, as well as good sense, he preferred to meet his detractors in person, and succeeded in a series of long conferences, in conciliating them completely.

UNDER the new agreement, the Suez Canal Company is at once either to enlarge the present canal or build a new one; and is to accept seven new directors from among the English merchants and shippers who use the Canal, augmenting at the same time the number of employés at the canal who speak English. The company is, after July 1 next, to abolish pilotage fees on the Canal, and is to assume the pecuniary responsibility for all accidents occurring in the Canal, except those caused by collisions. Perhaps the most interesting of the new provisions is one which stipulates that whenever the profit for the year, to be divided among the stockholders, shall exceed eighteen per cent, one-half of the excess over eighteen per cent shall be applied to the reduction of the tolls for transit, and that if the income shall exceed twenty-five per cent, the whole of the surplus over twenty-five per cent shall be employed in reducing the tolls until they shall be brought down to five francs per ton. It is a little amusing to see so much thought expended to prevent the profits of an undertaking which was not long ago decided as visionary and ruinous from exceeding twenty-five per cent a year, but the English ship-owners seem to be in earnest about the reduction of their tolls, and to hasten the time when a surplus of income shall be available for that object, it is further agreed that after the reserve fund, for which five per cent of the net profits is now retained, shall have reached five million francs, only three per cent of the net profits shall be applied to increasing it.

A NEW PROCESS OF MANUFACTURING PORTLAND CEMENT.



WE are, by the courtesy of the Commissioners of the District of Columbia, enabled to lay before our readers Prof. E. J. De Smedt's report to the Engineer Commissioner of the District for the last fiscal year, a report which we believe has not yet been published.

OFFICE OF CHEMIST D. C., WASHINGTON, D. C., October, 1883.

MAJOR G. J. LYDECKER,

U. S. ENGINEER, ENGINEER COMMISSIONER, D. C.:—

Major,—I have the honor herewith to submit a report of the operations of this office during the fiscal year ending June 30, 1883. They have continued, as heretofore, to be chemical and mechanical analyses, and scientific investigations and experiments for the various departments of the District of Columbia, more especially for the Engineer Department, Health Office and Metropolitan Police.

ENGINEER DEPARTMENT.

For the Engineer Department I have, as in preceding years, made daily analyses, as the work progressed, of the mixture of the asphalt pavements laid in the District. The average percentage of asphalt cement in 168 samples is:—

Chemically pure cement	9.05 = Commercial
" " carbonate of lime,	8.90
Silica,	82.05
	100.00

The average composition of the asphalt blocks is as follows:—

Asphalt cement, chemically pure,	7.36
Broken stone, CaO, Co,	92.64
	100.00

These compositions give entirely satisfactory results. Weekly reports of the analyses were submitted to Captain F. V. Greene, Assistant Engineer, District of Columbia.

At the request of Captain Greene, several analyses of different asphalts and stones were also made, the results of which were at the proper time submitted to him.

At the request of Captain R. L. Hoxie, Assistant Engineer, District of Columbia, several analyses were also made of the grounds traversed in boring for the new water-works. These analyses were for the purpose of ascertaining the nature of the strata perforated, and reports thereof were submitted to him.

All the hydraulic cements used on the public works have, at my laboratory, been submitted to a daily test as to their tensile strength, and weekly reports of the results obtained, together with an annotation of the places where used, were submitted to Captain Hoxie and Captain Greene.

In my last year's report¹ it was endeavored to explain the qualities which an hydraulic cement ought to possess, and the processes and analyses employed, etc.; it is not deemed necessary to repeat here that explanation. I will, however, try to explain the subsequent experiments and researches made with a view to manufacture Portland cement in this country, in such a manner as to enable it to compete with the qualities and price of that made in England, France and Germany.

AVERAGE TENSILE STRENGTH, IN POUNDS PER SQUARE INCH, OF THE VIRGINIA AND MARYLAND CEMENTS USED ON THE WORKS OF THE DISTRICT.

Name.	Granular residue No. 60 sieve.	Quantity of sand with cement.	One day.	Five days.	Ten days.	Fifteen days.	Twenty days.	Thirty days.	Sixty days.	Ninety days.	Six months.	Twelve months.
Round-Top	0	Neat cement	57	104	138	175	190	253	314	330	348	390
		1 sand, 1 cement	20	90	115	120	135	155	225	245		
		2 sand, 1 cement		45	60	80	95	125	155	168		
Cumberland	0	Neat cement	49	105	153	188	200	222	309	320	335	360
		1 sand, 1 cement	15	80	120	128	132	145	215	225		
		2 sand, 1 cement		40	55	72	90	112	140	150		
Shepherdstown	0	Neat cement	32	67	87	108	129	180	227	250	290	320
		1 sand, 1 cement	10	45	70	82	95	116	140	165		
		2 sand, 1 cement		20	50	70	82	90	100	120		

¹ See American Architect for December 1, 1883.

AVERAGE TENSILE STRENGTH, IN POUNDS PER SQUARE INCH, OF PORTLAND CEMENT USED ON THE DISTRICT WORKS.

Name.	Granular residue No. 60 sieve.	Quantity of sand with cement.	One day.	Five days.	Ten days.	Fifteen days.	Twenty days.	Thirty days.	Sixty days.	Ninety days.	Six months.	Twelve months.
Saylor	20%	Neat cement	125	246	310	340	360	390	400	425	495	657
		2 sand, 1 cement	55	90	100	120	130	170				
Dyckerhoff	4%	Neat cement	170	335	353	362	380	430	525	570	670	700
		2 sand, 1 cement	100	125	163	170	208	260				
J. B. White & Bro.	14%	Neat cement	175	340	355	369	390	442	535	600	690	728
		2 sand, 1 cement	80	130	160	167	200	220				
O. F. Alsen & Son	3%	Neat cement	165	320	360	370	379	440	545	610	680	700
		2 sand, 1 cement	95	150	170	175	225	251				
Brooks, Shoobridge & Co.	8%	Neat cement	143	319	340	352	370	426	530	592	635	695
		2 sand, 1 cement	80	150	172	179	203	239				

AVERAGE TENSILE STRENGTH, IN POUNDS PER SQUARE INCH, OF THE AMERICAN STANDARD PORTLAND CEMENT.

Name.	Granular residue No. 60 sieve.	Quantity of sand with cement.	One day.	Five days.	Ten days.	Fifteen days.	Twenty days.	Thirty days.
American Standard Portland	0	Neat cement	130	313	371	472	490	590
		2 sand, 1 cement	80	193	223	270	295	350

The preceding tables represent the average tensile strength of the various kinds of home-made and Portland cements.

My last annual report ended with the expressed hope that we would no longer, for our public works, have to depend on the importation from foreign countries of Portland cement. Already these hopes have been almost realized by the following processes of my invention, which are now in operation on quite a large scale, and it is expected that the manufacture of Portland cement will be farther propagated throughout the United States, bringing this superior class of cement into more general use than heretofore, for all engineering works, it being a cement the results of which, when properly made, the engineer can with certainty rely upon.

Portland cement is in rare instances made from natural rock wherein the requisite ingredients have been found combined in proper proportions; usually it is manufactured from chalk and clay, either by the "dry" or "wet" process. These methods of manufacturing Portland cement are in extensive operation in Europe. Attempts have been made in this country to employ the same method; but owing to the difficulty of finding clay and chalk (carbonate of lime) containing in proper form the proper ingredients, in such proximity to one another as to admit of economical working, the attempts have not met with pecuniary success.

Argilo-calcareous cement-rocks, called hydraulic limestones, are found quite abundantly in this country, and have been used extensively for the manufacture of cement; but, although containing silica, alumina, lime and other ingredients, they are generally ineffective in themselves to produce Portland cement. The cements made from them are generally of the common class, such, for instance, as the Rosendale, the Cumberland, the Shepherdstown, etc. I ascertained that these stones are generally deficient in the amount of lime they contain, but, as a rule, wherever a cement-rock or hydraulic-limestone formation occurs, there are also to be found rocks capable of producing lime, which lime, in given proportion, can be added to the hydraulic or cement stones, in order to arrive at the proper proportions of the constituents of Portland cement. All the ingredients required for its manufacture are thus to be obtained on the spot, thus overcoming the great obstacle which heretofore has been in the way of a successful production of Portland cement in an industrial way. Still another impediment exists in this country which prevents the manufacture of Portland cement in competition with the manufacturers of Europe; that is, the high price of labor in this country. Therefore something had to be done in order to lessen the labor and the time, and consequently the cost of the manufactured article "Portland cement," and it is this result that I have practically accomplished.

In order that it may be more readily understood, I will first briefly describe the usual methods of manufacturing Portland cement, and will then state my improvements thereon.

Portland cement is a compound of argilo-calcareous substances; it may be made from either natural rock or earth wherein, by analysis, are found in the necessary proportions silica, alumina, lime, magnesia, etc.; or from a combination, or from mixing carbonate of lime with clay of various kinds. It can thus be made in two ways, known as the "wet" and the "dry" processes.

By the "wet" process clay and chalk, having been collected in the proper proportions, are thrown into a mill, water is added, the mixture is constantly stirred, and the "mix" is rendered into an

almost impalpable powder, causing a perfect admixture. The "mix," in a paste of about the consistency of cream, is then let to flow onto drying-floors heated by steam for the purpose of expelling, by artificial heat, the excess of water; or into backs or vats about two feet deep set in the open air, where, by evaporation and decantation, the water is drawn off. Under this process the paste is cut into bricks or squares, and dried by artificial or natural heat, after which they are ready to be placed in the kilns to be calcined, to be powdered and to be barrelled.

By the "dry" process the chalk and clay, or their equivalents, having been dried and powdered are in a dry state mixed in a dry mixer; they are then run into a pug-mill where just sufficient water is added to make a stiff paste. The material, as it exudes from the pug-mill, is cut into bricks and carried to a drying-room; after about two weeks' time it is ready to be brought to the kiln to be calcined, as described in the preceding process; it is then ground and barrelled.

If the moist paste could be calcined without drying, the following disadvantages would be obviated:—

- (a) The immense storage room for the wet paste.
- (b) The repeated handling.
- (c) The irregularity of the manufactured article, the paste being composed of materials of different specific gravities.
- (d) The large capital to carry the stock of the paste in the backs, and of the materials requiring by the wet process from two to three months to dry, and by the dry process about two weeks.
- (e) The large cost of drying-floors.
- (f) The large cost of fuel required in the drying operation.
- (g) The handling of the material from the mixer to the drying-floors or "backs," and then back to the kiln, as also the great waste of time and money before the mixed material can be used.

It is thus noticeable that all the disadvantages are directly due to the preliminary drying operation, which is performed before the calcining operation can take place, and for the following reasons:—

Ordinary paste formed into bricks or other forms, when subjected in the moist state to a great heat, will fly apart, and will break off into powder, leaving nothing behind; therefore proper calcination is impossible. This effect is due to the sudden evaporation of the water contained in the bricks or pieces. The water, in its course towards evaporation meets an obstacle (the coating formed on the outside of the bricks), and breaks it in order to escape. This scaling off goes on continually until the whole is reduced to powder. For that reason recourse is had to the method now in use of thoroughly drying the paste before calcining it—a process requiring great length of time and carried on at great cost.

The problem to be solved is how bricks or pieces can be produced in a state of moisture with sufficient porosity to allow the water of evaporation to escape during the calcining operation without breaking the bricks into small pieces or dust. I discovered that this result can be obtained by mixing a combustible, four to five per cent (a hydrocarbon preferred), with the argilo-calcareous material prior to the calcining operation. I also discovered that if the material were of such a character as to need a small percentage of potash, which sometimes is the case, sawdust could be used as the combustible, leaving with its ashes the needed potash, and producing the desired effect. In practice I first mix the combustible with the dry material in powder; I then add to this mixture water in sufficient quantity to make a thick paste; the mixing is effected in any suitable mixing apparatus. The paste thus produced is then in the usual way shaped into bricks or other forms which, in their moist state, are put into the kiln and subjected to the calcining operation; they should, in fact, be removed at once from the mill or place where formed, and put into the kiln, no delay being necessary. During the calcining operation the combustible contained in the brick burns out gradually, and the brick is thus little by little, according to the penetration of the combustion, made porous. The steam or vapor has thus afforded to it a free passage from the brick, and the latter, throughout the process of calcination, preserves its form and shape unimpaired. The calcination is more uniform and regular by reason of the introduction throughout the brick of a heat-giving combustible. After calcination, at the proper heat, the bricks or forms are ground, and the product is barrelled in the usual manner.

The advantages of this process over the methods of manufacture heretofore practised are numerous, and are perceived at a glance. It obviates all the disadvantages before enumerated; the need of vats or backs, and the acres of storage room required; it lessens the handling of the cement by about one-third, because it permits the paste to be carried directly from the mixers to the kilns; it prevents irregularity, which is the result of the wet system; it lessens the outlay of capital required to carry the paste for months before it is ready for use; it does away with drying-floors, and it also does away with all expense for fuel now required to dry the paste; in fact, as compared with both the "dry" and the "wet" systems it reduces the time required for its manufacture from months by the "wet" and weeks by the "dry" system to but two or three days; and finally, it insures a regular and uniform product at a reduced reasonable price, so reasonable as to insure its being sold, not only in competition with the article imported from Europe, but in preference to all other cements.

The Portland cement thus manufactured, which I shall here term the American Standard Portland Cement, gives the results as indicated by Table III, which, so far, certainly compare well with the very best imported Portland cement.

In my last annual report I was able to state that, by the labors of this Department, and the advice given by it to the Virginia and Maryland cement manufacturers, they were enabled to produce hydraulic cements far superior to the well-known Rosendale cement. That reputation has not been dimmed during the past year; the quality has rather been bettered, and yet the same low price still remains, about twenty per cent below that of the Rosendale cement, making an enormous saving for the public works of the District. Nevertheless, in all important public works Portland cement will, in time, take the place of the common home-made cements.

Looking over the tables of tensile strength of the various grades of cement, principally where mixed with sand, the great advantage of using the Portland quality in preference to the common cements will be perceived at a glance.

It is a well-known fact that many engineering works have only been made successful by the application of Portland cement. Its resources in application are almost innumerable. We have seen it applied with extraordinary success in works which heretofore were impossible to execute successfully. This is the principal reason why I have devoted so much time to discover a process by which to manufacture in this country this quality of cement, so as to facilitate a competition by American cement manufacturers, as well in quality as in price, with those of Europe. Much more can be said in regard to the application and qualities of the Portland cement; it would, however, lengthen this report, and would be more applicable in a treatise on the subject.

In conclusion, I may be permitted to add again what I have already stated in former reports, that the advancement in the art of manufacturing this very important cement is due to the patience and indefatigable labors of the Engineer Department of the District of Columbia, and I once more take the opportunity to thank the Commissioner and the officers of his department for the facilities, aid and encouragement they have granted me in the prosecution of my experiments.

LUZERNE, SWITZERLAND.



NUREMBERG, GERMANY
from a sketch by W. H. Miller

CONSIDERING the picturesque of the old town of Luzerne it is astonishing that more disciples of the brush do not visit it. Doubtless many young men and maidens who "sketch a little in water-colors" in the officer-in-the-army-and-navy style, may be seen at play upon the steamers and elsewhere, but they do not affect the little, simple nooks and corners which are the charm of the old town. Mountains under aspects of storm, with ever-changing effects of light and shade, are the subjects chosen by the amateur (who has studied Ruskin) to be transferred to paper or canvas. The real worker, on the contrary, is wiser; he knows by sad experience that the only really paintable scenery is the simple, and so, often enough, he steers clear of Switzerland; but that is no reason why he should not enjoy mountain air, and rejoice his heart by the sight of snowy peaks, for in almost all the towns and villages there is matter enough of a practicable kind to occupy him for weeks. At Zurich and Luzerne this is eminently the case, and if he can brave being mobbed by hordes of children in all stages of unpleasantness from the effects of sweets, cherries, or bread and butter, a painter cannot do better than pass his time in either town.

As to hotels, perhaps the best is the Hotel des Balances, overlooking, as it does, the clear, green river, although the hotels upon the lake have finer views of the mountains. There, under the yellow-striped awning which covers the balcony, looking out upon the Reuss, with the variously-colored houses reflected in its clear, transparent water, one can almost fancy oneself in Venice; indeed, as regards purity, the beautiful river might consider itself insulted by being compared to the stagnant, odoriferous canals of the Italian city. There is a fascination about this river which few possess, and the very swiftness with which the current rushes is an attraction in itself, particularly when seen from a balcony such as those of the Balances, or the restaurant of the Alpine Club hard by. From here, also, is to be had a very good view of the old Kapellbrücke with its water-tower, built in the sixteenth century as the foundation of a light-tower. Thence, according to some authorities, the name Lucerna, a lantern. The triangles formed by the beams supporting the pointed roof of the bridge are decorated with a series of pictures representing events in the history of the Canton, given by various notables of the town in the seventeenth century; curious, but of no artistic value. Formerly,

the Kapellbrücke reached across an arm of the lake, which passed over the present site of the esplanade up to the Hof-Kirche. On the north side of the river, close to the bridge, is the Petrus-Kapelle, an uninteresting building but for the quaint old fresco of St. Nicholas of Flüe, painted 1473, an alabaster bas-relief of Christ upon the Mount of Olives, dated 1661, and a curious old gargoye of a dragon's head, of the end of the sixteenth century.

Turning to the left is the Kornmarkt, with the old Rathaus, begun in 1602. The roof is high-pitched, and garnished with many quaint dormer windows; the portal is a good specimen of Italian Renaissance; and the tower is of that curious semi-Oriental character so often seen in Switzerland and the Tyrol—a central minaret bearing a clock, flanked at each corner by a smaller one, all covered with bright-red tiles, and ending in a tall vane. At the corner of the Kapell-gasse is a figure of a saint under a canopy, while on another side of the square is a seventeenth-century balcony and fountain. Passing through this square is the general market, which is held in the arcades under the Rathaus and other houses, as in Italian cities. Here, twice a week, is to be seen such a crowd as can only be gathered together in a European town, and such a noise to be heard as was only equalled, perhaps, at the building of the Tower of Babel. Fruit, vegetables, live-stock and raiment are all jostled together; while the sweet air is polluted by most ancient and cheese-like smells, and disturbed by the moans of the long-suffering calves, and the squeaks and quacks of those unclean beasts and birds who never bear their ills without a protest. Under the colonnade is a shop which I commend to the explorer, possessing charming specimens of the cheap pottery of the country.

Thence to the Mühlen-platz, and the Spreuer-brücke, with its pretty little conical-roofed chapel, and quaint "Dance of Death" pictures, is but a step. Another charming spot is the field just outside the town, whence one gets a fine view of the old town and towers—the Musegg—with a background of mountains. Some of these towers date as far back as the thirteenth century, and were originally used as watch-towers; two of them form gates, through one of which the Emperor Sigismund entered the town in 1417, as is seen in an old woodcut. Close to this gate, in the Züricher-strasse, is a Calvary, with an eight-sided, red-tiled roof, dated 1681.

The Hof-Kirche, dedicated to S. Leodiger, was begun in 1633. It has fourteen altars—all but two in the worst possible taste—a mass of gilding and crude coloring, but over the one in front of the chancel-screen is as beautiful a Crucifix (life-size) as can be seen anywhere. It is painted wood, and the feet are each nailed separately, which is seen mostly in early missal paintings; though Velasquez and Van Dyck both adopted that treatment. The wrought-iron screen is very fine; indeed, one of the features of Luzerne is the iron-work—almost all the balconies, inn-signs and gates being excellent in design and workmanship, and worthy of study. Above the high altar, which is of black marble, is a picture by Lanfranco, of our Lord upon the Mount of Olives, and at one side on the left, are very good works by Matteo Preti di Taverna, of SS. Andrew and Maurice. The stalls are good seventeenth-century carved wood-work, with canopies. The bells, eleven in number, make themselves heard frequently and not disagreeably, for they are of very good tone. The organ has gained a tremendous reputation, and no doubt at one time was remarkably fine, but neither the instrument nor the performer are equal to some less celebrated ones in France and England. Performances are given every evening during the season, the great feature of which is a clap-trap imitation of a storm. On the other hand, the vocal and instrumental concerts given now and then by the Musik-liebhaber Gesellschaft, under the direction of Herr Arnold, are of first-rate character.

The Jesuit's church is the finest in the town, and is not a bad specimen of Italian Renaissance. It was commenced in 1667. The altar is of red marble, and has a large picture by Torriani over it. Here was formerly the palace, and a little farther on, on the right, is a purely Italian colonnade and fountain, now forming part of the college.

The Franciscan church was commenced in the fourteenth century. Architecturally, little remains of much value, but the carved wood of the pulpit and stalls are good examples of seventeenth-century work. The Lady chapel is later (1626), its altar dating from 1723. It is separated from the side aisle by an iron screen (1734). Along the walls of the nave are painted representations of the old banners which were taken as trophies at the battles of Sempach, Grandson, Murten, etc. These copies were executed in the sixteenth century. Here, and in the other churches, are many lamps burning before the altars and shrines, which are old foundations, some dating as far back as the fourteenth century, since when they have never been extinguished. Outside in the place is an eight-sided fountain in yellow sandstone, by Rudolph Felix (1739), from the centre of which rises a pillar with a figure of St. Francis of Assisi on the top giving the benediction. In 1519 Hans Holbein is said to have painted a little flag on the then existing fountain, and some subject pictures upon the walls of the church, but they have long since disappeared, if they ever existed. Certain it is that Holbein was summoned to Luzerne in 1517 by Jakob von Hertenstein, bailiff of the town, to decorate his new house, both inside and out. The subjects were from the ancient stories of Greece and Rome; as Læna before her judges (the original sketch of which is in the Basle Museum); the stories of Tarquin and Lucretia, of Mucius Scaevola, and of Marcus Curtius. There were, besides, the armorial bearings of Hertenstein and his four wives, and various

decorative designs. These all perished in 1824, wilfully destroyed (with many of the towers of the Musegg) after three hundred years' existence, by a banker named Knör to make way for a new house; but some imperfect drawings from them, made by Colonel May von Büren, are still preserved in the town library.

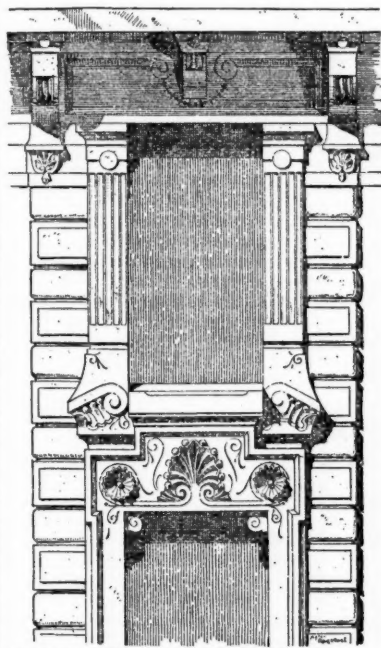
Hard by, at the hostelry of the Schlüssel, St. Carlo Borromeo put up in 1570, on his way to the Council of Trent, and opposite on the Liebenau-haus is a curious wooden cross, which tradition says is the one used by the preacher Mürner to excite the Luzernese against their brethren of Berne and Zurich in the sixteenth century. Picturesque bits may also be found about the cloisters, through the gaps in which views of the lake and mountains are obtained, and innumerable old cottages and barns are to be found close to the town, in fact, few places of the country so abound in them.

The museum in the Rathaus contains a few interesting things; two small sixteenth-century alabaster bas-reliefs; a rock-crystal crucifix of good workmanship; old Swiss and German stained-glass; a curious "Dance of Death" series of paintings; and a fine carved crucifix, by Welch-Wyrtsch, 1732-98.

Of course, subjects for landscape pure and simple abound in the neighborhood and upon the lake, as, for example, about Küssnacht; but my object in writing this is to show the sort of subjects an artist can find in the town, within a few minutes' walk of his hotel, without the effort of a long excursion accompanied by a heavy pack, a condition which makes sketching a terror to all but those of Herculean strength.

S. BEALE.

THE NEW EDDYSTONE LIGHT-HOUSE.



FROM HOUSE IN RUE DES BOURGONNIERS, PARIS. A. LOBBERT ARCHT.

AT the ordinary meeting of the Institution of Civil Engineers held on the 27th of November, Mr. Brunlees, President, in the chair, a paper was read on "The New Eddystone Light-House," by Mr. William Tregarthen Douglass, Associate Member Institute Civil Engineers.

The necessity for the construction of a new light-house on the Eddystone rocks had arisen in consequence of the faulty state of the gneiss rock on which Smeaton's tower was erected, and the frequent eclipsing of the light by heavy seas during stormy weather. The latter defect was of little importance for many years after the erection of Smeaton's light-house, when individuality had not been given to coast lights; but with the numerous coast and ship lights

now visible on the seas surrounding this country, a reliable distinctive character for every coast light had become a necessity.

The tower of the new Eddystone was a concave elliptic frustum, with a diameter of 37 feet at the bottom, standing on a cylindrical base 44 feet in diameter, and 22 feet high, the upper surface forming a landing-platform 2 feet 6 inches above high water. The cylindrical base prevented in a great measure the rise of heavy seas to the upper part of the tower, and had the further advantage of affording a convenient landing-platform, thus adding considerably to the opportunities of relieving the light-house. With the exception of the space occupied by the fresh-water tanks, the tower was solid for 25 feet 6 inches above high-water spring tides. At the top of the solid portion, the wall was 8 feet 6 inches thick, diminishing to 2 feet 3 inches in the thinnest part of the service-room. All the stones were dovetailed both horizontally and vertically, as at the Wolf Rock Light-House. Each stone of the foundation courses was sunk to a depth of not less than 1 foot below the surface of the surrounding rock, and was further secured by two Muntz-metal bolts 1½ inches in diameter, passing through the stone and 9 inches into the rock below, the top and bottom of each stone being fox-wedged. The tower contained nine rooms—the seven uppermost having a diameter of 14 feet, and a height of 10 feet. These rooms were fitted up for the accommodation of the light-keepers, and the stores necessary for the efficient maintenance of the lights; they were rendered as far as possible fire-proof, the floors being of granite covered with slate; the stairs and partitions were of iron, and the windows and shutters of gun-metal. The oil-rooms contained eighteen wrought-iron cisterns capable of storing 4300 gallons of oil, and the water-tanks held, when full, 4700 gallons.

The masonry consisted of 2171 stones, containing 62,133 cubic feet of granite, or 4668 tons. The focal plane of the upper light was 133 feet above high water, its nautical range was seventeen and one-half miles, and in clear weather it overlapped the beam of the electric-lights from the Lizard Point. The lantern was of the cylindrical helically-framed type adopted by the Trinity House. The glazing was 2 feet 6 inches higher than usual for first-order lights, this addition being necessary to meet the requirements of the special dioptric apparatus.

For the white fixed light exhibited from the three light-houses of Winstanley, Rudyerd, and Smeaton, at the Eddystone the Trinity House determined on substituting, as a distinction, a white double flashing-light at half-minute periods, showing two successive flashes, each of about three and a half seconds' duration, divided by an eclipse of about three seconds. It was also decided to show from a window in the tower, 40 feet below the flashing light, a sector of white fixed light, to cover the Hand Deeps, a dangerous shoal three and one-half miles north-west from the light-house. It was further arranged that a large bell should be sounded during foggy weather, twice in quick succession every half-minute, thus assimilating the character of the sound signal to that of the light. Two bells of 40 hundred-weight each, were mounted at opposite sides of the cornice, in order that a windward bell might be sounded during fog. The optical apparatus for the main light consisted of two superposed tiers of lenticular panels, twelve in each tier. Each lens panel subtended a horizontal angle at its foci of 30 degrees, and a vertical angle of 92 degrees, being $47\frac{1}{2}$ degrees above the central plane of the lens, and $44\frac{1}{2}$ degrees below it; and was composed of a central lens and thirty-nine annular rings or segments, there being twenty-one above and eighteen below the central lens. The twelve panels in each tier were fitted together so as to form a twelve-sided drum, each lens having its focus in a common centre at a distance of 920 millimetres. These lenses subtended the largest vertical angle of any yet constructed for coast illumination, the increased angle and consequent additional power being obtained by the adoption of heavy flint glass for the six highest and the three lowest rings of each panel. The light was derived from two six-wick "Douglass" burners, one being placed in the common foci of each tier of lenses, the illuminant being colza oil. With a clear atmosphere, and the light of the Plymouth Breakwater Light-house (ten miles distant) distinctly visible, the lower burner only was worked at its minimum intensity of 450 candles, giving an intensity of the flashes of the optical apparatus of 37,800 candles; but whenever the atmosphere was so thick as to impair the visibility of the Breakwater light, the full power of the two burners was put in action, with the aggregate intensity of 1900 candles for the lamps, and an intensity of the optical apparatus of 159,600 candles. This intensity was about 23.5 times greater than that of the fixed light latterly exhibited from Smeaton's tower, and about 3282 times that of the light first exhibited in the tower from tallow candles. The new tower was built at a distance of 130 feet from Smeaton's light-house, a large portion of the foundation being laid below the level of low-water spring tides. The estimate for the work was £78,000, and the cost £59,255.

The first landing at the rock was made in July, 1878, and the work was carried on until December. Around the foundation of the base of the tower a strong coffer-dam of brick and Roman cement was built for getting in the foundations. By June, 1879, the work was sufficiently advanced for the stones to be laid in the lower courses, and everything was arranged for H. R. H. the Duke of Edinburgh, Master of Trinity House, who was to be accompanied by H. R. H. the Prince of Wales, to lay the foundation stone on the 12th of the month; but the weather being stormy the ceremony was postponed until the 19th of August, when the lowest stone was laid by the Duke of Edinburgh, assisted by the Prince of Wales. On the 17th of July, 1880, the cylindrical base was completed, and the 38th course by the early part of November. On the 1st of June, 1881, the Duke of Edinburgh, when passing up Channel in H. M. S. *Lively*, landed at the rock, and laid the last stone of the tower. On the 18th of May, 1882, the Duke of Edinburgh completed the work, by lighting the lamps and formally opening the light-house. The edifice was thus erected and fitted up within four years of its commencement, and one year under the time estimated. The whole of the stones, averaging more than two tons each, were landed and hoisted direct into the work, from the deck of the steam-tender *Hercules*, by a chain-fall working between an iron crane fixed at the centre of the tower, and a steam-winch on the deck of the *Hercules*, which was moored at a distance of thirty fathoms from the rock.

The Town Council and inhabitants of Plymouth having expressed a desire that Smeaton's light-house should be re-erected on Plymouth Hoe, in lieu of the Trinity House sea-mark thereat, the Trinity House made over to the authorities at Plymouth the lantern and four rooms of the tower. For taking down and shipping Smeaton's masonry, the *Hercules* was moored at ten fathoms from the rock, and the stones were shipped, after the removal of the lantern, by her steam machinery, by a process exactly the reverse of that by which the stones of the new tower were landed. After the removal of the structure to the floor of the lower room, the entrance doorway and well staircase leading from it to the lower room were filled in with masonry, and an iron mast was fixed at the centre of the top of the frustum. — *Engineering*.

THE ILLUSTRATIONS.

MADISON AVENUE M. E. CHURCH, N. E. CORNER MADISON AVENUE AND SIXTIETH STREET, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

THIS church edifice, just completed, with its Sunday-school and lecture-room departments, covers the whole of a plot of ground, 100 feet 5 inches on Madison Avenue, by 89 feet on Sixtieth Street, the area of the church proper being situated as indicated on ground-plan, with its front and side upon the avenue and street, and the portion containing the Sunday-school and church parlors upon the north of the lot, with one front on the avenue. The gross seating capacity of the church, including a small gallery over front vestibule is 754, and of the lecture-room and Sunday-school room 500 exclusive of infant and Bible-class rooms provided in the gallery. The first story of the Sunday-school building is occupied by the church social parlors, which are treated in a thoroughly domestic style, and capable of being on occasions converted into one large room.

An inspection of the floor plans will show the arrangement of stairways, and the connection between the hall-way of Sunday-school building and vestibule of church.

In the matter of exterior design, the architect was somewhat restricted, not only by the shallowness of the lot, but the conditions as given by the building committee, which were that the building should be sufficiently ecclesiastical in character to prevent any misapprehensions as to the purpose of the structure, and at the same time it was thoroughly urged that the "conventional mannerisms" of a scholastic church design should be avoided; in other words a Gothic building was not wanted. This is the architect's defence for employing a somewhat free or romantic Romanesque style throughout.

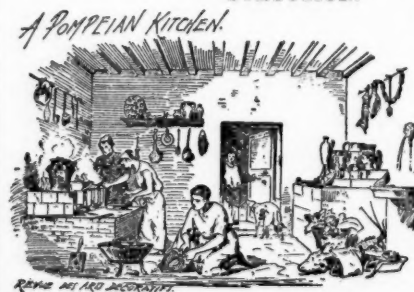
The exterior is built entirely of light Belleville brownstone, except the facing of clerestory, lantern and clock wings above belfry on the tower, which are of terra-cotta. The ashlar is rock-faced, the trimmings fine-tooled, giving only a slight variety of shade and texture. All the roofs are covered with red terra-cotta tile, and the finials, ventilators, etc., are of the same material.

The treatment of the interior is in general keeping with the exterior in detail, and the section indicates a nave and aisle construction with semi-circular ceiled and panelled roofs over both, the space left by the vaulted form in the aisle roof against the nave wall being utilized for effect, by opening into it semicircular arches springing from the nave columns. A shallow gallery having a somewhat triforium effect is thus obtained, and the shadow in these spaces thus gotten is an effective feature of the interior. The wood employed in finishing the interior is white-oak stained old gray in color, and it is intended that the prevailing tone of the decoration and wall-surfaces shall be copper-color, which is recalled in the windows, which are fitted with a combination of two thicknesses of rolled cathedral glass, leaded in simple geometrical patterns, giving great depth and richness of color. It is proposed to make the band at the level of the carved termination of the roof supports, which band runs unbroken around the whole interior, the main feature of the decorative scheme, and to which the other surfaces, excepting only the rear wall of chancel, will be subordinate. The gas-fixtures are of wrought polished copper.

SKETCHES OF BOSTON IRON-WORK. BY MR. J. SIMS TROWBRIDGE, CINCINNATI, O.

SKETCHES OF BOSTON DORMERS. BY MR. A. O. ELZNER.

ON SOME SANITARY ASPECTS OF HOUSE CONSTRUCTION.¹



LAST winter I read a paper on building stones to the members of the architectural section of the Philosophical Society, and the subject attracted a good deal of attention among the architects and builders in the city, especially as it had a direct bearing on the selection of a stone suitable for the erection of the magnificent pile of buildings about to begin by the Corporation of Glasgow. An opinion was also expressed that the chemist might give valuable information, and make useful suggestions to the architect and builder if he would devote his attention to the construction of buildings. The encouragement received on that occasion has induced me to bring before the architectural section of the Sanitary Institute a short paper on some of the sanitary aspects of house construction, excluding entirely from consideration the important subjects of drainage and sewerage, which I leave to others who have made them a special study.

¹ By Wm. Wallace, Ph. D., F. R. S. E., F. C. S., F. I. C., President of the Philosophical Society of Glasgow. Read at the Sixth Congress of the Sanitary Institute, Glasgow, September, 1883.

Granting, then, that a house is well drained, and that the plumbing work is properly trapped and ventilated, what is wanted to make it a healthy residence is that it should have plenty of light, and that it should contain at all times air pure and dry, or at least as pure and as dry as may be possible. The subject of light may be dismissed in a few words. The importance of having large windows is perfectly understood, and so far as isolated buildings are concerned, it is unnecessary to say anything. But as regards street architecture, it is of the utmost importance that houses should be built of a height bearing a direct relation to the breadth of the street in which they are situated; hence the paramount importance of having enacted by Parliament rigid building regulations for cities and towns, in order to prevent the erection of tenements of such a height in proportion to the breadth of the street, that the windows in the lower stories get little or no sunlight. This is a subject which has been thoroughly discussed in this and other cities, and I hope that in course of time, more stringent rules than we at present possess will be enacted. A fair proportion in this latitude is that the house should not exceed in height two-thirds of the breadth of the street; thus giving three stories in height for a street of 45 to 50 feet wide, and four stories for one of 60 to 70 feet. I say, advisedly, "in this latitude"; for while at the equator the sun at mid-day is perpendicular or nearly so, in high latitudes it forms with the earth's surface an angle more or less acute. Hence a street in Cairo of only 15 or 20 feet wide may be better lighted than one of 40 or 50 feet in Stockholm. As regards the direction of a street I should prefer to live in one placed as near as possible north and south; in this case, and taking the west side of the street as an example, the sun shines from morning till mid-day in the front, and from mid-day till the evening in the back of the house; but in a street running east and west, the houses on the south side get scarcely any direct sunlight—in winter none at all—in front; while those on the north side are equally unfortunate as regards the back rooms. No apartment can, in my opinion, be considered a perfectly wholesome one which does not enjoy direct sunlight during some part of the day; but if an apartment must be so situated that it cannot have sunlight, it is some compensation that it have very large windows, so that it may get as much diffused daylight as possible.

Purity of air cannot be maintained in a house unless it be thoroughly dry. Setting aside the not inconsiderable quantity of water produced by our own breathing, and by the combustion of gas, oil and candles, the air in a house is liable to be rendered unwholesome from excess of moisture, first, by absorption of water from the rock or soil below, and second, from the porous stone of which the building is constructed. Not only is the air loaded with moisture from these sources, but it is rendered impure from the exhalations of fungous vegetation or dry-rot, which at the same time destroys the joists and other carpentry work, and seriously affects the stability of the house. It is a mistake to suppose, as many do, that dry-rot attacks only the wood in the basement story. It is a common occurrence for the ends of joists built into porous stone to become affected by fungous vegetation; and it is frequently seen in pulling down old tenements that the ends of the joists are quite gone, and that, probably, for many years the joists have been resting only on the plaster cornices of the rooms. The remedy is the use of "shoes" of glazed fire-clay, or other material, which are built into the wall, and into which the ends of the joists are placed. The "shoes" should be somewhat larger than the joists, which should be kept in position by little wedges of wood, so that air can play freely around the ends of the joists. Such protected joists will last for hundreds of years, if other circumstances are favorable.

The porosity of most varieties of building stone is remarkable. In the paper to which I have already referred, I have given, besides other properties, the quantity of water capable of being absorbed by the stone when air-dried. By weight it ranges from 3.4 per cent in the celebrated Craigleith stone to 7.2 per cent in the red sandstone found in Wemyss Bay, on the Firth of Clyde. The significance of this property of porosity is still more readily appreciated if we take the amount of water absorbed by bulk instead of weight. One hundred parts by measure of the hardest and best freestone take up about eight parts of water, and the inferior kinds 12 to 15 parts. A cubic foot of the stone will therefore absorb from 5 to 9 pounds of water, or from half a gallon to nine-tenths of a gallon. The absorption of water by certain kinds of stone is so rapid that in slight showers of rain the whole of the water that falls is imbibed; and although a great part of this evaporates afterwards from the surface of this stone, a portion must always find its way inwards, and this is especially the case when the surface of the stone is kept constantly wet by continued rain.

Another property of freestone is its power of permitting the passage of air or other gas by transpiration and diffusion. A cube of stone varnished over on four sides and enclosed on the other two in an air-tight case, provided with inlet and outlet tubes, permits the passage of coal-gas to such an extent that the gas can be lighted and will continue to burn, even although the pressure is not more than an inch of water. The same thing applies to other building stones which we, more or less, possess, and to bricks, unless these have been exposed to a temperature high enough to flux the material of which they are made. The quantity of air diffused into and out of a house by the walls must be very considerable, and as it is a process that is constantly going on, it must necessarily exercise an appreciable influence in maintaining the purity of the air in dwelling-houses. If, however, the stone or brick is saturated with water, the

porosity is, for the time being, destroyed; or, if there is any air diffused at all it will be loaded with watery vapor, and therefore of less value, in a sanitary point of view, than it would be with only its normal proportion of moisture. Besides this evil there is the more serious one of the water actually reaching the joists and other wood, such as "dorks," and wall-plates and straps, and causing these to decay, and so interfering with the stability of the structure. Coating the stone with oil, paint, silicate of soda solution, or other means of rendering it impervious to water, prevents the absorption of rain; but it also, at the same time, destroys the valuable property of diffusing pure air into, and impure air out of the house. The only way I know of securing the advantages of the porosity of the stone and preventing the injurious action to which I have referred, is to have double walls, with a space of a few inches between, into which air is freely admitted by openings in the wall at top and bottom, placed in such a manner that rain will not enter them or lodge in them. The openings may be about three inches square, and placed about six inches apart, and they should be sloped upwards for the reason I have just stated. The inner wall may be of brick, either 4½ to 9 inches thick according to the height of the building, and it should be tied into the outer wall by pieces of thick iron wire with angled ends. The system of building with concrete blocks, pursued in Sandown, Ventnor and other places in the Isle of Wight, is well adapted for constructing walls on the principle I have indicated. The blocks of concrete are about 18 inches wide, by 12 inches, and are of two thicknesses, those for the outer wall being 4 or 5 inches, and for the inner about 3 or 3½ inches in thickness, and these are tied together by pieces of iron wire, with a space of about three inches between them. This forms what looks to those accustomed to the two-foot thick solid walls of Scottish houses, a very flimsy wall, but it appears to be sufficiently strong for a building of two stories in height, and with a few openings above and below for the admission of air into the space between the outer and inner walls, it would form a structure which, in a sanitary point of view, would be perfect, although I would prefer to have the inner wall of brick, which is more porous than the blocks of concrete, formed of fine gravel and cement, which are used in the Isle of Wight.

It is a common observation that, in spite of every care being taken in the construction of a building, the joints of the stone are often imperfect and admit water freely, especially when the rain is accompanied, as it often is, by high wind, especially when the wind comes from the southwest. To prevent the rain penetrating it is customary in some districts to build, not on a flat bed, but one sloping slightly upwards. This is a system highly to be commended; and if it be objected to on the ground of giving less stability to the building than work upon a perfectly level bed, this objection might be overcome by making the greater part of the bed level, with about two inches of the stone on the exterior side of the wall slightly bevelled.

In the case of rubble walls the best that can be done, probably, is to point them with a mixture of Portland cement with twice its bulk of sand, taking care that the sand is not too fine; and then to whitewash the entire walls with Portland cement, a process which may be repeated with advantage. But the pointing should not be done until the walls have had a summer's sun and are practically dry; otherwise the greater part of the water in the walls will evaporate inwards, that is, into the house, and so keep the atmosphere damp for a longer time than is actually necessary. A two-foot wall will not dry thoroughly, however, in less than two years.

As regards the interior of houses, plaster, whether on brick or lath, is exceedingly porous, and permits of a ready diffusion of gases; and a wall merely whitewashed or colored with distemper is better in a sanitary point of view than one that is covered with oil paint, which becomes by this process practically impervious to the passage of gases. Wall-papers are probably not so bad in this respect as oil paint, but are certainly inferior to distemper or whitewash.

The foundation of a house and the basement are the most important parts of it as regards its sanitary condition. The most perfect foundation upon which a house can be built is a solid platform of concrete, extending over the entire area of the building, and from two to three feet in thickness, according to the height of the walls, and coated over on the top with nearly pure cement. No damp could penetrate this mass; but I would not, even in this case, lay the sleeper joists upon the concrete, but would place them at a sufficient height to obtain ventilation of the space below the floor. In case of accident, arising from the bursting of water-pipes or other causes, I would make the concrete with a slight upward slope towards the centre of the area, so that water could run away freely through the ventilating gratings. This would be a somewhat expensive foundation, but I think it would be a most satisfactory one. Another system which would probably prove equally good is to build the foundation walls and dwarf walls up to a certain level, fill in the interior spaces with broken material to the same level, and cover the whole surface with a layer of Portland cement, with two parts coarse sand three inches thick. Another system still is to place a damp-course of slate or slatey stone, bedded in Portland cement, on the whole of the walls; fill up the whole foundation to the same level with broken material, and cover this, but not the walls, with asphalt. This makes excellent foundation, but the filling-in is generally omitted, the architect being content with a damp-course on the walls just below the sleeper joists, and levelling the interior space and asphalt. In this way I have seen very serious evil resulting from the absorption of water from the soil by the portion of the walls below the damp-course, then giving off

sufficient watery vapor to keep the space below the floor quite damp and to introduce dry-rot to a most alarming extent. It is a not uncommon practice to neglect the precaution of putting a damp-course on dwarf walls, in which case dry-rot is almost certain to occur unless there is profuse ventilation. In such a case the joists should be laid not on a wall-plate of wood, but upon roofing-slates placed below each joist, but it is better to place along the top of the dwarf walls a complete anti-damp course of roofing-slates bedded in cement, and upon this to lay a wall-plate in the usual manner.

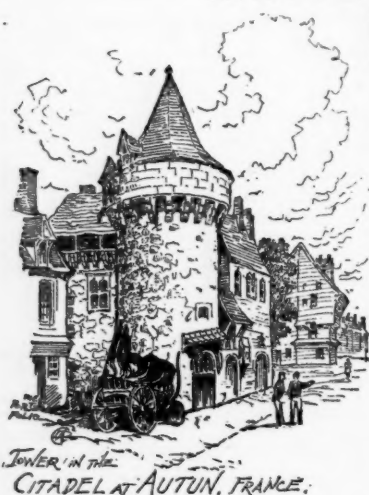
With regard to the ventilation of the space below the basement floor, it is a safe rule to have gratings all round the building, if it is a detached house, not more than 10 feet apart; but if it is in a street where ventilation can be obtained only in front and back, the gratings should not be more than 5 or 6 feet apart, and should be of ample size, say 10 inches by 6. In order to facilitate the free circulation of air, the dwarf walls and partition walls should have numerous and large openings. It may be objected that such ample ventilation as I have indicated would make a cold basement story; but the simple remedy is to put ashes, with or without lime, below the floor, in the same way that deafening is applied to the upper floors.

In a wet climate, such as ours, in which it is not an uncommon occurrence to have half an inch of rain falling in a single day, it is a proper thing to cover the chimney-tops, in order to prevent rain from coming down and keeping the gable walls to some extent constantly damp, and it is a good thing to combine with the cover a means of preventing down-draught in the chimneys during high winds. The cover which I recommend is one having a flat top with a space below, the whole chimney-top and cover being constructed of galvanized-iron. The chimney is 10 inches diameter at the bottom and 8 inches at the top, the cover is 12 inches diameter, and the space between the top of the chimney and the top of the cover is 4 inches. The cover is supported on three iron rods, and is fixed by nuts in the top, which are easily removed when the chimney is to be swept. All chimneys should be lined with fire-brick cylinders, very carefully jointed, otherwise a great deal of watery vapor from the combustion of the coal will find its way into the gable walls, and there may be trouble also from smoke. A chimney from a gas-stove, unless kept open below, is certain to give trouble from the condensation of water. Every cubic foot of coal-gas gives by combustion about an ounce of water; and as gas-stoves consume from 10 to 30 cubic feet per hour, a very large quantity of water is produced. In ordinary coal fires the large proportion of heat wasted up the chimney prevents any considerable condensation of water, unless when a fire is just lighted; but in the case of gas-stoves the heat passing up the chimney is comparatively small, and is probably never sufficient to prevent entirely the condensation of water.

In this brief sketch I have taken up only one branch of my subject, and I do not propose to deal with others, such as the ventilation of dwelling-houses and public buildings; but I shall merely notice, in conclusion, an exceedingly simple means of ventilating apartments, which I have found to give excellent results. It is to put in every window in a house a series of perpendicular holes, one inch in diameter, in the lower frame of the top sash of the windows. The holes may vary in number from three to six, according to the breadth of the window, and I may say that I have not found it necessary, even during the prevalence of the highest wind, or during the coldest weather, to close any of these orifices.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

THE PUMP-DREDGE.



TOWER IN THE
CITADEL AT AUTUN, FRANCE.

makes the excavation. Over this cutter, and partly surrounding it is a hood, which allows water to enter only from beneath. Over the top of this hood a twenty-inch pipe leads up to the large centrifugal pump of six feet in diameter. From this a line of wrought-iron pipe

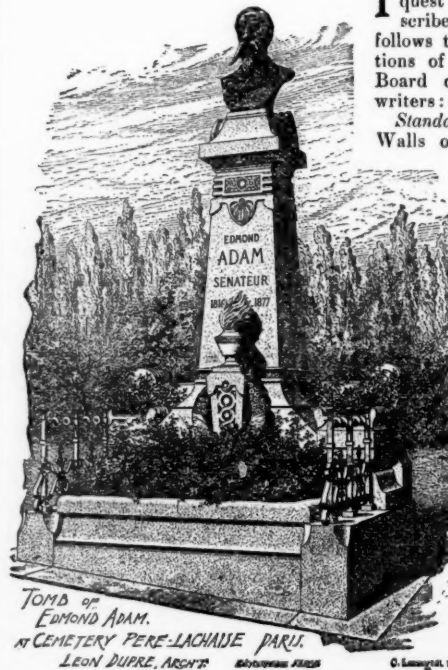
At a meeting of the Society, December 5th, 1883, a paper by Mr. L. J. Le Conte, M. Am. Soc. C. E., describing the dredging operations at Oakland Harbor, California, was, in the absence of the writer, read by the Secretary. The work described was the excavation of a tidal basin, and the deposit of the excavated material on the adjoining salt marshes. The machine used was a pump-dredge, with a cutting apparatus consisting of a horizontal wheel with ordinary plows upon its lower face. The rotation of this wheel

supported partly on pontoons and partly on the marsh, extends several hundred feet upon the tract to be reclaimed. The material, after leaving the cutter, is taken up by the water, passes through the pump and through the pipe to its place of deposit, without at any time during the transportation coming to a state of rest. The engines are two 16" x 20" engines, used exclusively for driving the centrifugal pump, and two 12" x 12" engines for driving the cutting apparatus, swinging the gear, etc. The steam is supplied by two one hundred horse-power boilers, generally carrying ninety to ninety-five pounds of steam. The amount of material transported with the water runs at times as high as forty per cent by volume, but experience has shown that in the material excavated at this point, which is a blue clay mud, it is not advisable to carry more than fifteen per cent, particularly in order to secure a uniform distribution at the place of deposit. The total quantity moved by one dredge in eight months was 250,000 cubic yards. The best work in one month was somewhat over 60,000 cubic yards in two hundred and thirty engine hours; the average distance of transportation being 1,100 feet. The greater distance transported was during October, when 45,000 yards were deposited in one hundred and ninety engine hours through 1,600 to 2,000 feet of twenty-inch pipe. The average daily expense account was stated as approximately \$102, but this did not include the cost of the nine or ten men on shore, employed to secure a proper disposition of the material, particularly as the fill approaches completion, nor did it include the cost of retaining embankments where required. The result of the work was stated to be, with this one pump-dredge, an average of 30,000 cubic yards, measured in the cut at a maximum cost of 10 cents per cubic yard, and in one particular month of twenty-three days work, 60,000 cubic yards were deposited on shore at a distance of 1,600 to 2,000 feet from the dredge at a cost of 5 cents per cubic yard. The complete distribution of the material at the place of deposit has been very satisfactory, the result being a cluster of cones whose slopes are very flat—not more than one and one-half per cent, and frequently so slight as to appear almost level. The paper was discussed by the members present.

"STANDARD" BUILDINGS.

IN consequence of a request made by a subscriber, we publish as follows the new regulations of the New York Board of Fire Underwriters:—

Standard Building.—1. Walls of brick, of the thickness required by the present building law (Section 6), with projections to receive the beams, and coped. Charge for deficiencies: If of stone or iron, or if the walls be of less than the standard thickness, five cents per \$100 of insurance; if without projections, unless the walls are of sufficient thickness to admit of 12 inches of



TOMB OF
EDMOND ADAM.
IN CEMETERY PERE-LACHAISE, PARIS.
LEON DUPRE, ARCHT. G. LAMBERT, SCULPT.

brick between the ends of the beams on each story, five cents.

2. Roof of iron or copper upon iron rafters, and without skylights; or of brick or the patent roofs approved by the Board. Charge for deficiencies: If metal, slate or tile on wooden rafters, or of composition approved by Committee on Surveys, five cents; if composition not approved, ten cents; if skylight through roof only, unless said skylight is of heavy glass, at least one-half inch in thickness, in iron frame or with iron shutters, five cents.

3. Area: There shall not be more than 5,000 square feet of ground covered by the building, unless it be subdivided by one or more party-walls extending from the foundation to and through the roof, and coped. Charges for deficiencies: For every additional 2,000 square feet or fraction of 2,000 square feet, of space between walls, five cents.

4. Shutters of iron or other fire-proof material, approved by the Committee on Surveys, having suitable iron frames to all windows, except the first floor front, to be placed either inside or outside, at least four inches from any wood-work and from the window frames

and casings, unless they be of metal. The centre row of shutters on the front, above first story, to be so arranged as to be opened from the outside. All shutters must be closed at night. Charges for deficiencies: If without approved shutters to rear or side windows, not opening on the street, ten cents; if without approved shutters to front windows, five cents; if without approved shutters to side windows, five cents; rolling iron shutters to doors and windows, unless they can be opened from the outside, five cents. No charge is to be made for the absence of shutters in warehouses having a space of 125 feet in front. Storage stores are to have double shutters on front, rear and sides; storage stores not having double shutters will be charged in addition to the schedule rate of five cents. Single shutters only will be required in storage stores fronting on the water, or having a space of 125 feet in front.

5. Parapet walls to be at least 4 feet high above the roof, 12 inches thick, and coped, and to have openings above the roof suitable for fire defense. If without 4 feet of parapet walls separating the building from adjoining buildings, a charge of ten cents will be made for the deficiency.

6. Cornices or gutters of brick or of metal, if secured to the building by metal fastenings only and without backing of wood. If gutters or cornices are wood, a charge of ten cents will be made for the deficiency.

Standard Building Rule 7 requires floors to be without skylight, elevator or hatchway openings, and a charge of ten cents will be made if there are skylight openings through one or more floors, unless with iron frame and heavy plate-glass not less than three-fourths inch in thickness, or having iron shutters or suitable trap-doors. Hatchway openings not provided with trap-doors as approved by the Committee on Surveys will be charged for at the rate of ten cents additional. An extra charge of twenty cents will be made for open elevators.

Rule 8 requires that stairways shall be closed, subject to the approval of the Committee on Surveys, and if not so closed, a charge of ten cents will be made for the deficiency.

Rule 9 fixes the standard height of buildings at 60 feet, and for every 10 feet or fraction thereof in excess of 60 feet in height up to 80 feet, a charge of five cents will be made. Over 80 feet, for every additional 5 feet or fraction thereof, five cents will be charged.

The standard width of streets is fixed by Rule 10 at 50 feet, and warehouses on streets less than 50 feet in width will be rated ten cents additional.

Rule 11 deals with buildings having mansard roofs, and defines the standard as follows:—

If constructed entirely of iron and covered with slate or metal, or lined by fire-proof material and approved by the Committee on Surveys, and having walls through the roof and coped, no wood being used in its construction, and there being heavy iron shutters to all openings, they will be subject only to charge for height, which from the main cornice to the top of the roof shall be added to the height of the building below the main cornice in determining the entire height of the building. Charges for deficiencies: Mansard roof varying in any particular, to be subject, in addition to the charge for height, to an extra specific charge of fifty cents; if over 70 feet in height, the addition to be one hundred cents. A semi-mansard roof is intended to apply to such roofs as have been altered in part, or half a story added, or with frame structures upon the roof, which cannot be strictly ranked as mansard roofs, and are subject to an additional charge of twenty-five cents.

An additional rate is also to be charged for external exposures.

CALCULATING A SCHOOL-HOUSE FLOOR.

BIRMINGHAM, CONN., December 18, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you be kind enough to give your opinion concerning the following: a school-house is being erected here, in which are several rooms with floors supported by spruce joists, 2" x 14", 12 inches apart from centres, with a clear span of 30 feet.

Trautwine's formula for calculating the strength of timbers when supported at both ends and loaded uniformly is $W = \frac{C b d^3}{L} \times 2$, with a factor of safety of 3, for ordinary use; but Clark, in a note prefacing his treatise on "Building Superintendence," in view of the recent experiments of Professor Lanza, says, if one-half of Trautwine's constant be taken as the true one, and a factor of safety of four be allowed, the result will be approximately correct. The corrected formula will read $W = \frac{1}{2} \frac{C b d^3}{L} \times 2$. In this case $C = 450$ (Traut.) $b = 2"$, $d = 14"$, $L = 30'$. Then the foregoing formula becomes $\frac{225 \times 2 \times 196}{4 \times 30} \times 2 = W = 1470$ pounds.

The New York building law requires an allowance of not less than 120 pounds weight per square foot plus weight of floor itself. The double floor will weigh about 6 pounds per square foot, and the plaster, etc., below about 8 pounds, making 14 pounds per square foot for flooring and plastering. The joist itself will weigh about 180 pounds. As the span is 30 feet, and the distance from centre of one space to centre of next is 12 inches, each joist will carry the weight upon 30 square feet, which will be $\frac{30 \times 120}{12} + \frac{30 \times 14}{12} + 180 = 4200$ pounds, an amount nearly three times as great as the beam should bear according to the formula.

I hold that 120 pounds per foot is not an excessive estimate for the

weight of scholars and furniture (Haswell allows 175 pounds for public buildings), and that the floor, while it will probably stay in place, is not as strong as it ought to be. Am I correct? ARCHITECT.

[We should like to make sure that "Architect's" observation of facts is quite exact. Spruce beams only two inches wide by fourteen inches deep are very rarely used, and unless braced laterally by frequent rows of bridging would be liable to fail by turning over sideways, under a strain much short of their breaking weight. Supposing, however, the dimensions given to be correct, and ample bridging to be provided, we should say that the beams were just strong enough for class-rooms where the load upon them would be so scattered by the light and bulky desks as rarely, if ever, to exceed an average amount of 25 to 30 pounds to the square foot. For a school hall or exhibition room the case would be different, and although in such a room, filled with settees, the average load on the floor could hardly reach 50 pounds to the square foot, the beams would have to be one-half stronger, say 3" x 14", to carry it safely. For ante-rooms and passageways, liable to be packed with a moving crowd, the New York allowance of 120 pounds load to the square foot of floor might not be too much, and the dimensions of the beams should be calculated accordingly. The estimates of load given in the New York building law should not be depended upon. With the factor of safety of three, required by that law, and the constants specified, the sizes of beams derived from the formula would be much too small, but the necessary element of safety is to a certain extent supplied by insisting upon theoretical loads which for ordinary buildings are greatly in excess of the actual ones. It is only necessary to reflect that in a room, 25' x 30', arranged with 60 single desks, for 60 children, the total extraneous load on the floor, supposing the desks and the books in them to weigh 50 pounds each, and the children 60 pounds each on an average, would be 6000 pounds, or, adding the weight of the teacher and his desk, and a globe or two, perhaps 7000 pounds, making a total distributed load of 94 pounds on each square foot, to see that 75 pounds, or 120 pounds as the New York law requires, is an unreasonably large allowance.—EDS. AMERICAN ARCHITECT.]

THE CINCINNATI GARFIELD MONUMENT COMPETITION.

December 17, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Referring to your editorial notice of Mr. Rebisso's complaint against the Cincinnati Garfield Monument Committee, allow me to add that your premises are not entirely correct. At the time of Mr. Rebisso's published card, the committee had indeed adopted a model of a competitor who had violated the principal terms of the programme, but they had not announced their decision publicly. Afterwards, however, on the protest of the other competitors, they reconsidered their decision, and falling back upon their reserved right (see circular) to reject any or all designs, declared that none was adopted, but ordered the honorarium to be paid to all competitors! It is not my purpose to discuss here the measure in which they impeached their fame as men of honor in so doing; but to ask your opinion as to how such action affects the legal aspect of the case, and the right of the competitors to claim full compensation for their expended time and trouble—the honorarium, as usual, amounting to only about ten per cent of a fair valuation thereof.

As the matter stands, the committee not having in its individual relations with each disappointed competitor violated a single item of the circular, I cannot see on what grounds any further claim could be made. I wish I could, for I should rejoice to be able to teach one set of committee ignoramuses (not to use a worse name) a much-needed lesson. Why should not these competitions be regulated by national laws, provided we can lay our hands on a Congress with brains enough to properly frame them? Very sincerely,

"A COMPETITOR."

[We are glad to be furnished with some additional particulars in regard to this matter, but do not hesitate to say that if the published invitation expressly reserved to the committee the right to reject all the models, none of those who thought fit to accept such terms can complain at their doing so. In regard to the regulation of artistic competitions in general, it may be suggested to our correspondent that there is a body of persons much more interested than the United States Congress in having such contests honestly and successfully carried out, as well as more influential in securing the enforcement of such regulations as it may adopt. This body is composed of the artists themselves, who have only to resolve upon the terms on which they will insist in such cases to find them universally accepted. If there is anything certain in this world, it is that important buildings, or works of sculpture or decoration, will not be executed without the aid of architects or artists; and that this professional assistance will be secured, whatever it may cost. Moreover, the service which is desired by the public is not that of the dishonest or incapable hangers-on of the artistic professions; but of the best-trained and most competent members of each, and these, by a little courage and concert of action, have it in their power at any moment to change the whole system of competitions in this country. The only essential condition is that whatever rules are thought desirable by artists for the regulation of competitions should be unanimously adopted, and rigorously adhered to. So long as an occasional lion is to be seen among the curs who yelp and squabble for the small bones which committees hold out, just so long will committees believe that, notwithstanding their size, lions need nothing more than small bones for their proper nourishment. If the noble beasts would simply with one accord remain in their dens until an adequate bait should be offered them, the hunters would not be long in providing it. To illustrate this principle we need only refer to the competition about which our correspondent writes. Speaking, as he does, with pardonable bitterness of the paltry dodge by which the committee revenged itself upon the sculptors who objected to being made the victims of an apparent trick, he forgets that the competitors themselves, by accepting unworthy terms, invited just such treatment as that which they received. If they had declined to undertake the task proposed to them until they were assured beyond a doubt of such treatment as artists in other countries expect, they would probably have secured that assurance; or if not, they would at least have been warned in time to keep clear of the whole affair.

One other point should be kept in mind by those who wish to make competitions here what they are abroad—that artists who suffer from the bad faith of committees must not content themselves with the piling complaints in the newspapers and indignant resolutions in their clubs which give the

average business man so much amusement, but should demand the exact and literal performance of the contract to which they form one party; proceeding, if their representations are not received with proper attention, to enforce their rights at law. If we are correctly informed as to the circumstances two or three controversies of this kind have recently occurred, which if carried into court, would serve to illustrate the common law on the subject in a manner somewhat startling to committees of the ordinary kind. If, as is probably the case, lack of courage and money on the part of the sufferers prevents them from trying to obtain the redress of their grievances, the artistic professions might do worse than take up their cause, advancing the small sums necessary to secure proper legal advocates, and sustaining them by expressions of sympathy. If, after this was done, and justice obtained, the painters, sculptors, and architects of the United States would agree in adopting rules for the government of the competitions in which they may take part, similar to those observed on the other side of the ocean, they would soon see these trials become a means for exciting and rewarding the highest efforts of the best men, instead of a pretext for defrauding and degrading both art and artists. — EDS. AMERICAN ARCHITECT.]

TRUSTEES' MEETING, A. I. A.

AMERICAN INSTITUTE OF ARCHITECTS, SECRETARY'S OFFICE,
NEWPORT, R. I., December 26, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—At a meeting of the Board of Trustees, A. I. A., held in the city of New York on Wednesday, December 19, the following minute of respect and esteem was presented.

"The death of our late Fellow, Mr. Henry Fernbach, of New York city, is a loss so great that it is vain to attempt to estimate it.

"It is rare, indeed, to find a man combining, as he did, such large proportions of wit, kindness, energy, integrity and intellect. It is rare to find an architect holding ground among the foremost of his profession, and practising it actively and widely for so many years; having, as he had, not an enemy, but hosts of friends among his employés, his clients and his professional brethren.

"He was devoted to his art, and his ready help in all matters which tended to elevate it and further its higher aims, together with his ready sympathy for its practitioners, and especially for the members of this Institute, were marked features in a character illuminated by the genial glow of a warm heart."

The Board thereupon resolved "that the above minute of respect and esteem be entered upon our record, and that the Secretary be instructed to forward a copy of the same to the widow of Mr. Fernbach, and that a copy be sent to the *American Architect and Building News*." Very respectfully, GEO. C. MASON, JR.,
Secretary, A. I. A.

WATER-PROOFING FOR WALLS.

ST. LOUIS, December 22, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—As an answer to the question asked by Mr. Burns in the *American Architect* for December 15, I will say that I use a compound composed largely of paraffine, with other ingredients added simply to increase its durability, and prevent the growth of fungus, and have it covered by United States patents; also, a patent on the method and apparatus for applying it with heat; another on my method of cleaning a wall after treating it; and still another patent on a solution of the paraffine in hydro-carbon, by means of which I can treat stone without heat by applying the paraffine in a dissolved state. Mr. Burns has perhaps seen the process being applied by the men of Joseph Chapman, the purchaser of the right for Philadelphia.

Yours truly, THEODORE HUNT.

PRESSED-BRICK FACINGS.

LOUISVILLE, KY., December 16, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen.—Will you be kind enough to publish, or send us by mail, a specification for a good job of pressed-brick work as done on the tall houses in New York and Boston. There are very few houses in this part of the country on which the pressed-brick runs higher than four stories, and on the few houses where it has been run higher, trouble has been caused by the difference in shrinkage between the wide joints of the common brick and the thin joints of the pressed-brick; the effect being to throw all the weight on the pressed-brick, and in some cases to crack it, and bulge it out at the bottom. If our brethren in the East have found a sure cure for this trouble we would be glad to hear what it is. Very truly yours,

MCDONALD BROS.

[In the high New York buildings faced with pressed-brick, the backing is always laid in cement and sand without lime, and bonded thoroughly with the face by clipping the corners of the pressed-brick every five or seven courses, and laying rows of diagonal headers behind them: or by splitting a course of face-bricks in halves, every foot or so in height, and laying a continuous row of ordinary headers behind them.—EDS. AMERICAN ARCHITECT.]

DESIGNS FOR CHEAP HOUSES.

BOSTON, December 30, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I have seen and read with pleasure the competition in your journal in regard to a \$3,000 and a \$1,500 house, but would be still better pleased if you would go a little lower, say \$1,000 (but not as J. T. B. wants, in your issue of October 6, I think, which is answered in a later issue by an architect from Dover, N. H.), for a

single house suitable for one or two families. Could you not work it some way that builders as well as architects would become interested in the matter, and by that means, or your work, give information of value to the general public. I would like to see what our builders can do, and I feel assured that there are more than I with the same thought and desire in their minds—a little home for themselves in the suburbs. Please consider this matter, and do not throw this in the waste-paper basket, as it has cost me an amount of trouble to write it. CERES.

EXTERMINATING WHITE ANTS.

CHICAGO, ILL., December 19, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—Can you, or any of the readers of the *Architect* give the name of any preparation to prevent the destruction of timber by white ants in tropical climates. An early reply to the above in the *Architect* will be regarded as a kind favor.

Yours respectfully, T. N. BELL.

[CREOSOTING, if thoroughly done, will protect timber against the white ant. A wash of arsenic, or painting with Paris green or other arsenical pigments, is said to keep the insects away from wood so treated. A rather novel mode of preventing the ravages of white ants, which we have lately seen recommended, consists simply in the introduction of a swarm of red ants into the buildings infested with the more destructive insect. The red ants pursue their soft-bodied white brethren everywhere, and soon exterminate them.—EDS. AMERICAN ARCHITECT.]

WHERE TO STOP THE STAFF-BEAD.

WASHINGTON, D. C., December 13, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—To settle a dispute between two draughtsmen, will you kindly state which is the better construction in ordinary windows, without mullions or transoms,—for the "staff-bead" to come down upon the stone sill, or to stop on the wood sill. II.

[It is decidedly preferable to make the wooden sill so wide that the staff-bead will stop upon it. The stone sill is thus better covered and may be made of less depth. Moreover, the staff-bead is less liable to rot out at the bottom if it stops upon the wood-work than if it runs down to the damp stone; and finally, the extra projection of the sill required to stop the staff-beads is of great service where outside blinds are to be hung to the frame. A little money is saved to the frame-maker by running the staff-beads down past the sill, but this is more than counterbalanced by the saving which can be made in the stone sills if the other form of frame be used.—EDS. AMERICAN ARCHITECT.]

THE FALL OF A MARKET-HOUSE ROOF.

LANCASTER, PA., December 26, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—Enclosed you will please find a clipping describing the disaster which befel our public market-house. There are no professional architects in this city, and but few builders who possess a good theoretical knowledge of building construction. In this instance the corporation engaged the services of a man to design the building who has no connection whatever with the building trade, neither as an architect, builder, nor mechanic, and when one considers the terrible loss of life which would have undoubtedly been the result had the building collapsed a few hours later, it impresses one very forcibly that the capabilities of the architect of such a building should be of no ordinary ability.

On opposite side is sketch of roof-truss and dimensions, etc.

Yours, etc. C. E. URBAN.

[The roof of the market-house in question was crushed by the weight of snow upon it, and fell in very early on Christmas morning, just in time to avoid killing many persons out of the crowd which would have filled it a few hours later. As shown in the sketch which our correspondent kindly enclosed, the structure was one story in height, covered with a curved roof supported on arched lattice-girders of wood, tied at the feet with iron rods. The tie-rods were one and one-fourth inches in diameter, but not being upset at the ends, the effective diameter was reduced by the cutting of the screw-threads to one inch. We do not know the distance between the trusses, or the material of the roofing, so that it is impossible to say just what the strain upon the tie-rods may have been; but it is not surprising to learn that nearly all of them were found to be broken at the nuts.—EDS. AMERICAN ARCHITECT.]

ROOF-WATER AS A MOTIVE POWER IN THE TROPICS.—It has occurred to a gentleman resident in Georgetown, West Indies, that a possibly valuable source of energy is allowed to run to waste in the tropics in the shape of the water which pours off the roofs of the houses whenever there is a shower. The gentleman in question, in a lecture delivered recently before a local society, said that, "having been frequently struck by the great volume of water discharged from roofs during heavy tropical rains, it occurred to me that the power so wasted might be utilized in some way by converting it into electricity by the following means: The water from each roof might be conducted into one main down-pipe, in which would work a small turbine-wheel driving a dynamo-electric machine, the electricity so developed by every passing shower to be stored in accumulators of the type of Faure's secondary batteries. These, as they became charged in variable time, depending on the rainfall, could be collected and stored at central depots, from whence the power could afterward be distributed uniformly, either by electro-dynamic engines, or utilized directly for electric lighting."—*Scientific American*.

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 editors greatly desire 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.]

290,660. HYDRAULIC ELEVATOR.—Norman C. Bassett, Chicago, Ill.
224,662. STEAM-HEATING APPARATUS.—James H. Blessing, Albany, N. Y.
290,665. STEAM-RADIATOR.—John Collis, Des Moines, Io.
290,674. AUTOMATIC BELT-SHIFTER FOR ELEVATORS.—Frank W. Fuller, San Francisco, Cal.
290,731. LEAVES-THROUGH HANGER.—Josiah Bear and Henry Whittenberger, Fredonia, Pa.
290,750. PROJECTING CORNER-PIECE FOR PLASTERED WALLS.—Geo. W. Da Cunha, Montclair, N. J.
290,757. SLIDING DOOR.—Jas. R. Drilling, Terre Haute, Ind.
290,765. MANUFACTURE OF ARTIFICIAL STONE.—John W. Gallup, Denison, Tex.
290,789. HOISTING-DERRICK.—Wm. Manson, Chicago, Ill.
290,810. PIPE-TONGS.—Jas. L. Strait, Thomas, Mo.
290,812. AUGER-BIT.—Jas. Swan, Seymour, Conn.
290,824. AUTOMATIC VENT FOR WATER-PIPES.—Joseph D. Westgate, Manchester, N. H.
290,837. FIRE-PROOF MATERIAL.—John S. Beer, Buffalo, N. Y.
290,852. WATER-LENS FOR SOLAR HEATERS.—William Calver, Washington, D. C.
290,878. DOOR-SILL AND STEP.—Levi Haas, Chester, Pa.
290,886. CONCRETE FLOOR, ROOF, ETC.—Thaddeus Hyatt, New York, N. Y.
290,889. RULE OR MEASURE.—Frank J. Kellogg, Battle Creek, Mich.
290,902. AIR-HEATING FURNACE.—George W. Marnebeck, Philadelphia, Pa.
290,908. FIRE-ESCAPE.—George M. Miller and Frederick Kiemer, Chicago, Ill.
290,917. FIRE-ESCAPE.—Aaron Palmer, Rochester, N. Y.
290,939. BRICK-KILN.—Thaddeus S. Smith, St. Louis, Mo.
290,951. PUBLIC-HALL EXIT.—Rowena C. Webster, St. Louis, Tenn.
290,961. FIRE-ESCAPE.—Arthur Bixby, Baltimore, Md.
290,966. AUTOMATIC TORNADO-BREAKER.—Wm. S. Blunt, New York, N. Y.
290,991. PORTABLE HOUSE.—Earl Lee, Corona, N. Y.
291,001. FIRE-ESCAPE.—Newman J. Powell, Pontiac, Ill.
291,003. SASH-HOLDER.—Benjamin F. Reynolds, Verona, Pa.
291,001. RATCHET TOOL-HOLDER.—William E. Thayer, Williamsburg, Mass.
291,014. FIRE-ESCAPE.—Robt. S. Isard, Hudson, O.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report one permit has been granted, which is not of sufficient importance to be noted.
The labor market quotations remain unchanged.
ALTERATIONS.—J. G. Valiant, Esq., is making alterations to his store, cor. Madison Ave. and Orchard St., to cost about \$5,000; from designs by Messrs. Wyatt & Sperry, architects.

Boston.

BUILDING PERMITS.—*Brick.*—Gloucester St., Nos. 49 to 55, Ward 11, for Geo. Wheatland and Chas. A. Dodge, 4 dwells., 24' x 42', two st'y mansard; Vinai & Dodge.
Tremont St., Nos. 392 to 398, Ward 10, for G. W. Gibson and A. H. Allen, 2 dwells. and stores, 20' 30" x 50', four st'y flat; Holmes Bros., builders.
Wald St., near Hyde Park Ave., Ward 25, for John H. Lougham and James H. McManus, dwell., 15' 0" x 19' and 21' x 39', two-st'y pitch.
Chapman St., No. 69, Ward 15, for Margaret Lisky, dwell., 2' x 30', three-st'y flat; C. G. Heiner, builder.
Cambridge St., near Eastern Railroad track, Ward 4, for Eastern Railroad Co., engine house, 60' x 156' and 37', one-st'y flat.
Armstrong St., rear near Washington St., Ward 24, for Mrs. Esther J. McDowell, stable, 16' x 18', one-st'y pitch.
Unnamed Place, off Linden Ave., Ward 19, Valentine Bock, stable, 20' x 20', two-st'y flat; Valentine Bock, builder.
Commercial St., near Dorchester Ave., Ward 24, for Leander E. H. Jones, dwell., 20' x 24', two-st'y flat; C. E. Rieker, builder.
Shelton St., near Adams St., Ward 24, for Mary Kate Bradley, storage, 37' x 37', one-st'y pitch; Edward Porter, builder.

Brooklyn.

RAILROAD DEPOT.—West Shore & Buffalo Railroad Company have leased a valuable tract of land at

North Sixth Street and East River, for the establishment of a depot.
BUILDING PERMITS.—*Adams St.*, n. s. 175' e Bushwick Ave., 3 three-st'y frame tenements, tin roof; cost, each, \$4,400; owner and builder, Joseph Frisse, 19 Ten Eyck St.

Second St., s. e. cor. North Tenth St., four-st'y brick store and tenement, tin roof; cost, \$7,000; owner, Patrick Clark, cor. Fourth and North Tenth Sts.; architect, Th. Engelhardt; builder, John Falloon.

Clifton Pl., s. s. 327' e Grand Ave., four-st'y double flat, felt and gravel roof; cost, \$11,000; owner and builder, J. N. Smith, 257 Greene Ave.

Washington Ave., n. e. cor. Gates Ave., four-st'y brick tenement, gravel roof; cost, \$14,000; owner, H. L. Coe, 535 Washington Ave.; architect, Amzi Hill; builders, Wm. Kane & D. H. Fowler.

Sackett St., s. s. 250' w Third Ave., three-st'y frame tenement, tin roof; cost, \$2,000; owner, William Vaughan, Sackett St., near Third Ave.; architect, William Halstead; builders, John J. Gallagher and Wm. Murphy.

Palmetto St., s. s. 175' e Bushwick Ave., two-st'y frame dwell., tin roof; cost, \$4,000; owner, Mary Fisher, Central Ave.; architect and mason, John E. Sagat; carpenter, M. Sagat.

Baymont St., s. s. 203' 0" w Central Ave., 3 two-st'y frame dwells., tin or gravel roofs; cost, each, \$3,000; owner, Joseph Naul, 128 Myrtle St.; architect, R. H. Heasman.

ALTERATIONS.—*Broadway*, Nos. 636 and 638, raised one st'y, front walls to be rebuilt; cost, \$6,000; owner, J. L. Gans, Graham Ave., cor. Boerum St.; architect, J. Platte; builders, J. Awer & T. J. Balenbach.

Chicago.

SCHOOL-BUILDINGS.—Tolman Wheeler, of this city, who has already made a number of valuable gifts to the Episcopal Church, has deeded the church a valuable tract of land in the western division of the city, and advanced \$200,000 toward the erection of a church preparatory school. The design is to be after that of Oxford, a prominent feature of the structure being a chapel and a library to contain 10,000 volumes.

BUILDING PERMITS.—C. H. Harrison, Jr., two-st'y flats, 22 Spruce St.; cost, \$3,000.
David Seefeld, 2 three-st'y flats, 893-895 West Jackson St.; cost, \$8,000.

Phillip Waldorf, three-st'y and cellar dwell., 316 Twenty-fourth St.; cost, \$2,800; architect, F. C. Doerr; builder, P. Waldorf.

Conrad Seipp, 6 two-st'y and basement stores and dwells., 338-348 Twenty-sixth St.; cost, \$30,000; architect, Wm. Strippelman; builders, Geo. Lehman & Co.

New York.

FAILURES in real estate and building interests, in conjunction with snow-storms and holidays, have brought the building interests about to a standstill, and there is nothing of the slightest interest to report.

STORES.—It is proposed to build on the s w cor. Greene and Houston Sts., three first-class fire-proof stores, 37' 0" x 100' each, iron fronts; to cost \$125,000.

On the s e cor. Greene and Bleeker Sts., Mr. Isidor Cohnfeld proposes to build after May 1, a six-st'y store, 50' x 140'; to cost \$100,000.

BUILDING PERMITS.—*Eighty-first St.*, n. s. 200' e Second Ave., 3 five-st'y brick tenements, tin roofs; cost, each, \$17,500; owner, Philip Braender, Ave. B, between Eighty-fourth and Eighty-fifth Sts.; architect, John Brandt.

East Thirty-first St., No. 334, five-st'y brick tenement and shop, tin roof; cost, \$14,000; owner, Henry Tonjes & Co., 46 Horatio St.; architect, Ernest W. Greis; builder, not selected.

Fifty-sixth St., Nos. 420 to 426, one-st'y brick wagon-house, tin roof; cost, \$5,500; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, Chas. Stoll.

Thirty-first St., n. s. 240' e First Ave., two-st'y brick stable, tin roof; cost, \$5,000; owners, Wm. Wickes & Co., cor. Goerck and Third Sts.; architects, H. Schwarzman & Co.; builders, List & Lennan.

Broadway, n w cor. Fortieth St., and n s Fortieth St., 82' 9" w Broadway, seven-st'y brick hotel; cost, \$125,000; owners, Wm. H. and Chas. Gedney, 143 West Fortieth St., and Elliott Zborowski, by his agent, David B. Ogden, 28 East Ninth St.; architect, John Sexton; builders, W. B. and Chas. Gedney.

East Twenty-sixth St., No. 215, five-st'y brick tenement and store, tin roof; cost, \$15,000; owner, Anthony Abberton, on premises; architect, A. B. Ogden.

Broadway, No. 1697, three-st'y brick dwell. and store, tin roof; cost, \$5,000; owner and architect, Alex. Smyth, 243 West Fifty-fifth St.; builders, Jas. Stevenson and O. T. Mackey.

ALTERATIONS.—*Thirty-third St.*, Nos. 215 to 231, raise two stories; cost, \$8,500; owner, Fred. J. Kaldeberg, 125 Fulton St.; builders, J. & L. Weber.

Fulton St., No. 127, and *Ann St.*, No. 42, fronts altered and internal alterations; cost, \$6,000; lessees, Keuffel & Esser, 188 Hudson St.; architects, Lederle & Co.

Fifty-third and Fifty-fourth Sts., Nos. 1, 2, 3, 4, 5 and 6, repair damage by fire; cost, \$7,61; owners, A. & B. Kramer, 327 and 329 West Thirty-fifth St.; builder, Henry Wallace.

Greene St., Nos. 57 to 63, put in passenger-elevator; cost, \$7,500; owner, E. Oelbermann & Co., on premises; architect, Ed. H. Kimball; builders, W. A. & F. E. Conway and Chas. F. True.

Ninety-first St., n. s. 150' e Third Ave., two buildings, new roofs over present roofs; cost, \$3,000; owner, Jacob Rugert, 1639 Third Ave.; architects, Anthony Pfand & Son.

Philadelphia.

BUILDING PERMITS.—*Poplar St.*, No. 35, addition to ice-house, 34' x 57'; P. H. Somerset, contractor.

North Front St., No. 334, four-st'y brick building, 15' x 20'; Jno. F. Sanders, contractor.

West Girard Ave., No. 1209, three-st'y store and dwell., 18' x 69'; J. Wilson & Sons, contractors.

Mill St., w of York Road, one-st'y stable, 18' x 30'; W. Conrad, contractor.
During the year 1883 there were erected nearly double the number of stores and dwells. as during the previous year; the number being close to 4,000.

St. Louis.

BUILDING PERMITS.—Thirteen permits have been issued since our last report, eight of which are for unimportant frame houses. Of the rest, those worth \$2,500 and over are as follows:—

Jno. H. Dunlap, two-st'y brick dwell.; cost, \$3,300; E. Mortimer, architect; J. H. Dunlap, contractor.

Mrs. F. J. Folk, two-st'y brick dwell.; cost, \$3,100.

C. P. Krieger, two-st'y brick dwell.; cost, \$3,100.

Washington, D. C.

BUILDING PERMITS.—The following permits for new buildings worth \$3,000 or over have been issued since last report:—

Sixth St., between L and M Sts., n w, 2 three-st'y brick dwells., for Mrs. W. Reissner; cost, \$6,400.

N St., between Seventeenth and Eighteenth Sts., n w, three-st'y brick dwell., for Susan P. Okie; cost, \$8,000.

College Hill, three-st'y frame dwell., for R. B. Taylor; cost, \$4,000; Dwire & Obald, builders.

G St., between Twenty-second and Twenty-third Sts., n w, 2 two-st'y brick dwells., for Jno. White; cost, \$6,000; W. H. Germain, builder.

Bids and Contracts.

CHARLESTON, W. VA.—The contract for gas-fixtures for the public building has been awarded to Gibson de Kosenko & Co., of Philadelphia, the lowest bidders. The bids are as follows:—

Gibson de Kosenko & Co., \$1,379.50.
Cornelius & Co., \$1,749.50.

Horn, Pfeiffer & Brauner Manufacturing Company, \$1,840.50.
K. Hollings & Co., \$1,467.

Mitchell, Vance & Co., \$1,780.85.
Cox Sons, Buckley & Co., \$2,836.50.

CHICAGO, ILL.—Synopsis of bids for iron lattice partitions for silver storage vaults for custom-house and sub-treasury, Chicago, Ill.; post-office and court-house, Philadelphia, Pa.; custom-house and post-office, New Orleans; United States Treasury Building, Washington, D. C.:—

Phoenix Iron Foundry, Trenton, N. J.—Chicago, \$825; Philadelphia, \$1,200; New Orleans, \$4,327; Washington, \$5,320.

Beckman & Middleton, Georgetown, D. C.—Washington, \$5,114.

C. A. Schneider's Sons, Washington, D. C.—Washington, \$3,070.

George White & Co., Washington, D. C.—Washington, \$3,918.

Haugh, Ketcham & Co., Indianapolis, Ind.—Chicago, \$737.24; Philadelphia, \$1,920.67; New Orleans, \$4,328.10; Washington, \$4,978.06.

Etna Iron Works, Quincy, Ill.—Chicago, \$930; Philadelphia, \$1,925; New Orleans, \$4,948; Washington, \$5,460.

Cooper Manufacturing Company, Mount Vernon, O.—Chicago, \$1,167.22; Philadelphia, \$1,533.00; New Orleans, \$4,155.23; Washington, \$4,277.77.

George L. Damon, Boston.—Chicago, \$690; Philadelphia, \$1,480; New Orleans, \$3,470; Washington, \$3,600.

Pennsylvania Folding Iron and Steel Gate and Guard Company, Harrisburg, Pa.—Chicago, \$1,713; Philadelphia, \$2,160; New Orleans, \$5,300; Washington, \$5,500.

Joseph Hall & Co., Richmond, Va.—Chicago, \$1,300; Philadelphia, \$2,100; New Orleans, \$5,300; Washington, \$5,500.

E. T. Barnum Wire and Iron Works, Detroit, Mich.—Chicago, \$390.34; Philadelphia, \$1,226.05; New Orleans, \$3,322.04; Washington, \$3,410.32.

Charles O. Brown, Paterson, N. J.—Chicago, \$666; Philadelphia, \$1,018; New Orleans, \$2,713; Washington, \$3,112.

Globe Iron Works, Chicago, Ill.—Chicago, \$427.48; Philadelphia, \$992.62; New Orleans, \$672.20; Washington, \$3,456.80.

J. W. Bessell, Hoboken, N. J.—Chicago, \$660; Philadelphia, \$1,630; New Orleans, \$3,540; Washington, \$4,138.

George F. Gelbach, Philadelphia.—Philadelphia, \$1,571.89.

Etna Iron Works, Chicago, Ill.—Chicago, \$810.

Chicago Wire and Iron Works, Chicago, Ill.—Chicago, \$614.93; Philadelphia, \$1,317.43; New Orleans, \$3,399.62; Washington, \$3,732.84.

MEMPHIS, TENN.—The following is an abstract of the bids for fire-proof covering for the public building.

Utawata Tile Company, \$390 (accepted).
The Wright Fire proofing Company, \$400.

Mike McLaughlin, \$400.

MONTGOMERY, ALA.—The following is a synopsis of the bids for plastering the court-house:—

Joseph Eastman, \$4,196 (accepted).
D. W. Lloyd, \$4,300.

Smith & Grimp, \$4,363.
James Hughes, \$4,843.

M. T. Ford, \$5,200.
Brinfield & Coniff, \$7,160.

Figh & Williams, \$10,550.

NEW YORK, N. Y.—The following is an abstract of bids for furnishing and erecting two steam freight elevators, one in the Assay Office Building and the other in Public Stores Building, cor. Laight and Washington Streets, New York City:—

Assay Office Building.
Copeland & Bacon, \$2,466.

George C. Howard, \$2,721.
Otis Brothers & Co., \$2,725.

Whittier Machine Co., \$3,525.

Public Stores Building.
George C. Howard, \$4,432.

Otis Brothers & Co., \$5,272.
Whittier Machine Co., \$5,760.

Copeland & Bacon, \$6,060.

All the first bids for furnishing freight elevator

average business man so much amusement, but should demand the exact and literal performance of the contract to which they form one party; proceeding, if their representations are not received with proper attention, to enforce their rights at law. If we are correctly informed as to the circumstance: two or three controversies of this kind have recently occurred, which if carried into court, would serve to illustrate the common law on the subject in a manner somewhat startling to committees of the ordinary kind. If, as is probably the case, lack of courage and money on the part of the sufferers prevents them from trying to obtain the redress of their grievances, the artistic professions might do worse than take up their cause, advancing the small sums necessary to secure proper legal advocates, and sustaining them by expressions of sympathy. If, after this was done, and justice obtained, the painters, sculptors, and architects of the United States would agree in adopting rules for the government of the competitions in which they may take part, similar to those observed on the other side of the ocean, they would soon see these trials become a means for exciting and rewarding the highest efforts of the best men, instead of a pretext for defrauding and degrading both art and artists. — EDS. AMERICAN ARCHITECT.]

TRUSTEES' MEETING, A. I. A.

AMERICAN INSTITUTE OF ARCHITECTS, SECRETARY'S OFFICE,
NEWPORT, R. I., December 26, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—At a meeting of the Board of Trustees, A. I. A., held in the city of New York on Wednesday, December 19, the following minute of respect and esteem was presented.

"The death of our late Fellow, Mr. Henry Fernbach, of New York city, is a loss so great that it is vain to attempt to estimate it.

"It is rare, indeed, to find a man combining, as he did, such large proportions of wit, kindness, energy, integrity and intellect. It is rare to find an architect holding ground among the foremost of his profession, and practising it actively and widely for so many years; having, as he had, not an enemy, but hosts of friends among his employes, his clients and his professional brethren.

"He was devoted to his art, and his ready help in all matters which tended to elevate it and further its higher aims, together with his ready sympathy for its practitioners, and especially for the members of this Institute, were marked features in a character illuminated by the genial glow of a warm heart."

The Board thereupon resolved "that the above minute of respect and esteem be entered upon our record, and that the Secretary be instructed to forward a copy of the same to the widow of Mr. Fernbach, and that a copy be sent to the *American Architect and Building News*."

Very respectfully, GEO. C. MASON, JR.,
Secretary, A. I. A.

WATER-PROOFING FOR WALLS.

ST. LOUIS, December 22, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—As an answer to the question asked by Mr. Burns in the *American Architect* for December 15, I will say that I use a compound composed largely of paraffine, with other ingredients added simply to increase its durability, and prevent the growth of fungus, and have it covered by United States patents; also, a patent on the method and apparatus for applying it with heat; another on my method of cleaning a wall after treating it; and still another patent on a solution of the paraffine in hydro-carbon, by means of which I can treat stone without heat by applying the paraffine in a dissolved state. Mr. Burns has perhaps seen the process being applied by the men of Joseph Chapman, the purchaser of the right for Philadelphia.

Yours truly, THEODORE HUNT.

PRESSED-BRICK FACINGS.

LOUISVILLE, KY., December 16, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen.—Will you be kind enough to publish, or send us by mail, a specification for a good job of pressed-brick work as done on the tall houses in New York and Boston. There are very few houses in this part of the country on which the pressed-brick runs higher than four stories, and on the few houses where it has been run higher, trouble has been caused by the difference in shrinkage between the wide joints of the common brick and the thin joints of the pressed-brick; the effect being to throw all the weight on the pressed-brick, and in some cases to crack it, and bulge it out at the bottom. If our brethren in the East have found a sure cure for this trouble we would be glad to hear what it is.

Very truly yours,
McDONALD BROS.

[In the high New York buildings faced with pressed-brick, the backing is always laid in cement and sand without lime, and bonded thoroughly with the face by clipping the corners of the pressed-brick every five or seven courses, and laying rows of diagonal headers behind them; or by splitting a course of face-bricks in halves, every foot or so in height, and laying a continuous row of ordinary headers behind them.—EDS. AMERICAN ARCHITECT.]

DESIGNS FOR CHEAP HOUSES.

BOSTON, December 30, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I have seen and read with pleasure the competition in your journal in regard to a \$3,000 and a \$1,500 house, but would be still better pleased if you would go a little lower, say \$1,000 (but not as J. T. B. wants, in your issue of October 6, I think, which is answered in a later issue by an architect from Dover, N. H.), for a

single house suitable for one or two families. Could you not work it some way that builders as well as architects would become interested in the matter, and by that means, or your work, give information of value to the general public. I would like to see what our builders can do, and I feel assured that there are more than I with the same thought and desire in their minds—a little home for themselves in the suburbs. Please consider this matter, and do not throw this in the waste-paper basket, as it has cost me an amount of trouble to write it.

CERES.

EXTERMINATING WHITE ANTS.

CHICAGO, ILL., December 19, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—Can you, or any of the readers of the *Architect* give the name of any preparation to prevent the destruction of timber by white ants in tropical climates. An early reply to the above in the *Architect* will be regarded as a kind favor.

Yours respectfully, T. N. BELL.

[CREOSOTING, if thoroughly done, will protect timber against the white ant. A wash of arsenic, or painting with Paris green or other arsenical pigments, is said to keep the insects away from wood so treated. A rather novel mode of preventing the ravages of white ants, which we have lately seen recommended, consists simply in the introduction of a swarm of red ants into the buildings infested with the more destructive insect. The red ants pursue their soft-bodied white brethren everywhere, and soon exterminate them.—EDS. AMERICAN ARCHITECT.]

WHERE TO STOP THE STAFF-BEAD.

WASHINGTON, D. C., December 13, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—To settle a dispute between two draughtsmen, will you kindly state which is the better construction in ordinary windows, without mullions or transoms,—for the "staff-bead" to come down upon the stone sill, or to stop on the wood sill.

H.

[It is decidedly preferable to make the wooden sill so wide that the staff-bead will stop upon it. The stone sill is thus better covered and may be made of less depth. Moreover, the staff-bead is less liable to rot out at the bottom if it stops upon the wood-work than if it runs down to the damp stone; and finally, the extra projection of the sill required to stop the staff-beads is of great service where outside blinds are to be hung to the frame. A little money is saved to the frame-maker by running the staff-beads down past the sill, but this is more than counterbalanced by the saving which can be made in the stone sills if the other form of frame be used.—EDS. AMERICAN ARCHITECT.]

THE FALL OF A MARKET-HOUSE ROOF.

LANCASTER, PA., December 26, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—Enclosed you will please find a clipping describing the disaster which befel our public market-house. There are no professional architects in this city, and but few builders who possess a good theoretical knowledge of building construction. In this instance the corporation engaged the services of a man to design the building who has no connection whatever with the building trade, neither as an architect, builder, nor mechanic, and when one considers the terrible loss of life which would have undoubtedly been the result had the building collapsed a few hours later, it impresses one very forcibly that the capabilities of the architect of such a building should be of no ordinary ability.

On opposite side is sketch of roof-truss and dimensions, etc.

Yours, etc. C. E. URBAN.

[The roof of the market-house in question was crushed by the weight of snow upon it, and fell in very early on Christmas morning, just in time to avoid killing many persons out of the crowd which would have filled it a few hours later. As shown in the sketch which our correspondent kindly encloses, the structure was one story in height, covered with a curved roof supported on arched lattice-girders of wood, tied at the feet with iron rods. The tie-rods were one and one-fourth inches in diameter, but not being upset at the ends, the effective diameter was reduced by the cutting of the screw-threads to one inch. We do not know the distance between the trusses, or the material of the roofing, so that it is impossible to say just what the strain upon the tie-rods may have been; but it is not surprising to learn that nearly all of them were found to be broken at the nuts.—EDS. AMERICAN ARCHITECT.]

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290,660. HYDRAULIC ELEVATOR.—Norman C. Bassett, Chicago, Ill.
 290,662. STEAM-HEATING APPARATUS.—James H. Blessing, Albany, N. Y.
 290,665. STEAM-RADIATOR.—John Collis, Des Moines, Io.
 290,674. AUTOMATIC BELT-SHIFTER FOR ELEVATORS.—Frank W. Fuller, San Francisco, Cal.
 290,731. LEAF-TROUGH HANGER.—Josiah Bear and Henry Whittenbarger, Fredonia, Pa.
 290,750. PROJECTING CORNER-PIECE FOR PLASTERED WALLS.—Geo. W. De Cuba, Montclair, N. J.
 290,757. SLIDING DOOR.—Jas. K. Drilling, Terre Haute, Ind.
 290,765. MANUFACTURE OF ARTIFICIAL STONE.—John W. Gallup, Denison, Tex.
 290,780. HOISTING-DERRICK.—Wm. Manson, Chicago, Ill.
 290,789. PIPE-TONGS.—Jas. L. Strait, Thomas, Mo.
 290,812. ALGER-BIT.—Jas. Swan, Seymour, Conn.
 290,824. AUTOMATIC VENT FOR WATER-PIPES.—Joseph D. Westgate, Manchester, N. H.
 290,837. FIRE-PROOF MATERIAL.—John S. Beer, Buffalo, N. Y.
 290,852. WATER-LENS FOR SOLAR HEATERS.—William Calver, Washington, D. C.
 290,878. DOOR-SILL AND STEP.—Levi Haas, Chester, Pa.
 290,886. CONCRETE FLOOR, ROOF, ETC.—Thaddeus Hyatt, New York, N. Y.
 290,888. RULE OR MEASURE.—Frank J. Kellogg, Battle Creek, Mich.
 290,902. AIR-HEATING FURNACE.—George W. Marbeck, Philadelphia, Pa.
 290,908. FIRE-ESCAPE.—George M. Miller and Frederick Riener, Chicago, Ill.
 290,917. FIRE-ESCAPE.—Aaron Palmer, Rochester, N. Y.
 290,939. BRICK-KILN.—Thaddeus S. Smith, St. Louis, Mo.
 290,951. PUBLIC-HALL EXIT.—Rowena C. Webster, St. Lipscomb, Tenn.
 290,961. FIRE-ESCAPE.—Arthur Bixby, Baltimore, Md.
 290,966. AUTOMATIC TORNADO-BREAKER.—Wm. S. Blunt, New York, N. Y.
 290,991. PORTABLE HOUSE.—Earl Lee, Corona, N. Y.
 291,001. FIRE-ESCAPE.—Newman J. Powell, Pontiac, Ill.
 291,003. SASH-HOLDER.—Benjamin F. Reynolds, Verona, Pa.
 291,007. RATCHET TOOL-HOLDER.—William E. Thayer, Williamsburg, Mass.
 291,014. FIRE-ESCAPE.—Robt. S. Isard, Hudson, O.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report one permit has been granted, which is not of sufficient importance to note.
ALTERATIONS.—J. G. Valiant, Esq., is making alterations to his store, cor. Madison Ave. and Orchard St., to cost about \$5,000; from designs by Messrs. Wyatt & Sperry, architects.

Boston.

BUILDING PERMITS.—*Brick*.—Gloucester St., Nos. 49 to 55, Ward 11, for Geo. Wheatland and Chas. A. Dodge, 4 dwellings, 24' x 42', two st'ys mansard; Vinai & Dodge.
Tremont St., Nos. 392 to 398, Ward 10, for G. W. Gibson and A. H. Allen, 2 dwellings and stores, 20' 3/4' x 50', four st'ys flat; Holmes Bros., builders.
Wood.—Walk Hill St., near Hyde Park Ave., Ward 23, for John H. Lougham and James H. McManus, dwell., 15' 6' x 19' and 21' x 39', two-st'ys pitch.
Chapman St., No. 69, Ward 15, for Margaret Lisky, dwell., 21' x 30', three-st'ys flat; C. G. Heiner, builder.
Cambridge St., near Eastern Railroad track, Ward 4, for Eastern Railroad Co., engine house, 60' x 156' and 370', one-st'ys flat.
Armadine St., rear, near Washington St., Ward 24, for Mrs. Katharine J. McDowell, stable, 16' x 18', one-st'ys pitch.
Unnamed Place, off Linden Ave., Ward 19, Valentine Bock, stable, 20' x 20', two-st'ys flat; Valentine Bock, builder.
Commercial St., near Dorchester Ave., Ward 24, for Leander E. H. Jones, dwell., 20' x 24', two-st'ys flat; C. E. Ricker, builder.
Shelton St., near Adams St., Ward 24, for Mary Kate Bradley, storage, 25' x 35'; one-st'ys pitch; Edward Porter, builder.

Brooklyn.

RAILROAD DEPOT.—West Shore & Buffalo Railroad Company have leased a valuable tract of land at

North Sixth Street and East River, for the establishment of a depot.

BUILDING PERMITS.—*Adams St.*, n. s. 175' e Bushwick Ave., 3 three-st'ys frame tenements, tin roof; cost, each, \$4,400; owner and builder, Joseph Frisse, 19 Ten Eyck St.

Second St., s. e. cor. North Tenth St., four-st'ys brick store and tenement, tin roof; cost, \$7,000; owner, Patrick Clark, cor. Fourth and North Tenth Sts.; architect, Th. Engelhardt; builder, John Fallon.

Clifton Pl., s. s. 325' e Grand Ave., four-st'ys double flat, felt and gravel roof; cost, \$11,000; owner and builder, J. N. Smith, 257 Greene Ave.
Washington Ave., n. e. cor. Gates Ave., four-st'ys brick tenement, gravel roof; cost, \$14,000; owner, H. L. Coe, 535 Washington Ave.; architect, Amzi Hill; builders, Wm. Kane & D. H. Fowler.

Sackett St., s. s. 250' w Third Ave., three-st'ys frame tenement, tin roof; cost, \$2,000; owner, William Vaughan, Sackett St., near Third Ave.; architect, William Halstead; builders, John J. Gallagher and Wm. Murphy.

Palmetto St., s. s. 175' e Bushwick Ave., two-st'ys frame dwell., tin roof; cost, \$4,000; owner, Mary Fisher, Central Ave.; architect and mason, John E. Sagar; carpenter, M. Sagar.

Snyder St., s. s. 203' 6' w Central Ave., 3 two-st'ys frame dwell., tin or gravel roofs; cost, each, \$3,000; owner, Joseph Nall, 128 Myrtle St.; architect, R. H. Heasman.

ALTERATIONS.—*Broadway*, Nos. 636 and 638, raised one st'y, front walls to be rebuilt; cost, \$6,000; owner, J. L. Gans, Graham Ave., cor. Boerum St.; architect, J. Platte; builders, J. Awer & T. J. Balenbach.

Chicago.

SCHOOL-BUILDINGS.—Cholman Wheeler, of this city, who has already made a number of valuable gifts to the Episcopal Church, has deeded the church a valuable tract of land in the western division of the city, and advanced \$200,000 toward the erection of a church preparatory school. The design is to be after that of Oxford, a prominent feature of the structure being a chapel and a library to contain 10,000 volumes.

BUILDING PERMITS.—*C. H. Harrison, Jr.*, two-st'ys flats, 22 Spruce St.; cost, \$3,000.
David Seefeldt, 2 three-st'ys flats, 893-895 West Jackson St.; cost, \$8,000.

Phillip Waldorf, three-st'ys and cellar dwell., 316 Twenty-fourth St.; cost, \$2,800; architect, F. C. Doerr; builder, P. Waldorf.
Conrad Seipp, 6 two-st'ys and basement stores and dwell., 338-348 Twenty-sixth St.; cost, \$30,000; architect, Wm. Strippelman; builders, Geo. Lehman & Co.

New York.

FAILURES in real estate and building interests, in conjunction with snow-storms and holidays, have brought the building interests about to a standstill, and there is nothing of the slightest interest to report.

STORES.—It is proposed to build on the s w cor. Greene and Houston Sts., three first-class fire-proof stores, 37' 6' x 100' each, iron fronts; to cost \$125,000. On the s e cor. Greene and Bleeker Sts., Mr. Isidor Cohnfeld proposes to build, after May 1, a six-st'ys store, 50' x 140'; to cost \$100,000.

BUILDING PERMITS.—*Eighty-first St.*, n. s. 200' e Second Ave., 3 five-st'ys brick tenements, tin roofs; cost, each, \$17,500; owner, Philip Braender, Ave. B, between Eighty-fourth and Eighty-fifth Sts.; architect, John Brandt.

East Thirty-first St., No. 334, five-st'ys brick tenement and shop, tin roof; cost, \$14,000; owner, Henry Tonjes & Co., 46 Horatio St.; architect, Ernest W. Greis; builder, not selected.

Fifty-sixth St., Nos. 420 to 426, one-st'ys brick wagon-house, tin roof; cost, \$5,500; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, Chas. Stoll.

Thirty-first St., n. s. 240' e First Ave., two-st'ys brick stable, tin roof; cost, \$3,000; owners, Wm. Wicke & Co., cor. Goerck and Third Sts.; architects, H. Schwarzman & Co.; builders, List & Lennon.

Broadway, n. w. cor. Fortieth St., and n s Fortieth St., 82' 9' w Broadway, seven-st'ys brick hotel; cost, \$123,000; owners, Wm. H. and Chas. Gedney, 143 West Fortieth St., and Elliott Zborowski, by his agent, David B. Ogden, 28 East Ninth St.; architect, John Sexton; builders, W. B. and Chas. Gedney.

East Twenty-sixth St., No. 215, five-st'ys brick tenement and store, tin roof; cost, \$15,000; owner, Anthony Aberton, on premises; architect, A. B. Ogden.

Broadway, No. 1697, three-st'ys brick dwell. and store, tin roof; cost, \$5,000; owner and architect, Alex. Smyth, 243 West Fifty-fifth St.; builders, Jas. Stevenson and O. T. Mackey.

ALTERATIONS.—*Thirty-third St.*, Nos. 215 to 231, raise two stories; cost, \$6,500; owner, Fred. J. Kaldeberg, 125 Fulton St.; builders, J. & L. Weber.
Fulton St., No. 127, and *Ann St.*, No. 42, fronts altered and internal alterations; cost, \$6,000; lessees, Keuffel & Esser, 188 Hudson St.; architects, Lederle & Co.

Fifty-third and Fifty-fourth Sts., Nos. 1, 2, 3, 4, 5 and 6, repair damage by fire; cost, \$7,61; owners, A. & B. Kramer, 327 and 329 West Thirty-fifth St.; builder, Henry Wallace.

Greene St., Nos. 57 to 63, put in passenger-elevator; cost, \$7,500; owner, E. Oelbermann & Co., on premises; architect, Ed. H. Kimball; builders, W. A. & F. E. Conway and Chas. F. True.

Ninety-first St., n. s. 150' e Third Ave., two buildings, new roofs over present roofs; cost, \$3,000; owner, Jacob Rugert, 1639 Third Ave.; architects, Anthony Prand & Son.

Philadelphia.

BUILDING PERMITS.—*Poplar St.*, No. 35, addition to ice-house, 34' x 57'; P. H. Somerset, contractor.

North Front St., No. 334, four-st'ys brick building, 15' x 20'; Jno. F. Sanders, contractor.

West Girard Ave., No. 1209, three-st'ys store and dwell., 18' x 69'; J. Wilson & Sons, contractors.

Mill St., w. of York Road, one-st'ys stable, 15' x 30'; W. Conrad, contractor.

DURING the year 1883 there were erected nearly double the number of stores and dwellings as during the previous year; the number being close to 4,000.

St. Louis.

BUILDING PERMITS.—Thirteen permits have been issued since our last report, eight of which are for unimportant frame houses. Of the rest, those worth \$2,500 and over are as follows:—

Jno. H. Dunlap, two-st'ys brick dwell.; cost, \$3,300; E. Mortimer, architect; J. H. Dunlap, contractor.
 Mrs. F. J. Folk, two-st'ys brick dwell.; cost, \$3,100.

C. P. Krieger, two-st'ys brick dwell.; cost, \$3,100.

Washington, D. C.

BUILDING PERMITS.—The following permits for new buildings worth \$3,000 or over have been issued since last report:—

Sixth St., between L and M Sts., n. w. 2 three-st'ys brick dwell., for Mrs. W. Reissner; cost, \$6,400.
N St., between Seventeenth and Eighteenth Sts., n. w. three-st'ys brick dwell., for Susan F. Okie; cost, \$8,000.

College Hill, three-st'ys frame dwell., for R. B. Taylor; cost, \$4,000; Dwire & Obaid, builders.
G St., between Twenty-second and Twenty-third Sts., n. w. 2 two-st'ys brick dwell., for Jno. White; cost, \$6,400; W. H. Germain, builder.

Bids and Contracts.

CHARLESTON, W. VA.—The contract for gas-fixture for the public building has been awarded to Gibson de Koenko & Co., of Philadelphia, the lowest bidders. The bids are as follows:—

Gibson de Koenko & Co., \$1,379.50.
 Cornelius & Co., \$1,749.50.

Horn, Pfeiffer & Brauer Manufacturing Company, \$1,840.50.

R. Holdings & Co., \$1,467.
 Mitchell, Vance & Co., \$1,780.85.

Cox Sons, Buckley & Co., \$2,236.50.

CHICAGO, ILL., ETC.—Synopsis of bids for iron lattice partitions for silver storage vaults for custom-house and sub-treasury, Chicago, Ill.; post-office and court-house, Philadelphia, Pa.; custom-house and post-office, New Orleans; United States Treasury Building, Washington, D. C.:—

Phoenix Iron Foundry, Trenton, N. J.—Chicago, \$25; Philadelphia, \$1,500; New Orleans, \$4,127; Washington, \$3,520.

Beekman & Middleton, Georgetown, D. C.—Washington, \$3,114.

C. A. Schneider's Sons, Washington, D. C.—Washington, \$3,070.

George White & Co., Washington, D. C.—Washington, \$3,918.

Haugh, Ketcham & Co., Indianapolis, Ind.—Chicago, \$737.24; Philadelphia, \$1,920.67; New Orleans, \$3,428.19; Washington, \$4,078.66.

Atina Iron Works, Quincy, Ill.—Chicago, \$930; Philadelphia, \$1,925; New Orleans, \$4,948; Washington, \$5,460.

Cooper Manufacturing Company, Mount Vernon, O.—Chicago, \$1,167.22; Philadelphia, \$1,333.06; New Orleans, \$4,155.55; Washington, \$4,277.77.

George L. Dunham, Boston.—Chicago, \$690; Philadelphia, \$1,480; New Orleans, \$3,470; Washington, \$3,600.

Pennsylvania Folding Iron and Steel Gate and Guard Company, Harrisburg, Pa.—Chicago, \$1,715; Philadelphia, \$2,160; New Orleans, \$5,300; Washington, \$5,500.

Joseph Hall & Co., Richmond, Va.—Chicago, \$1,350; Philadelphia, \$2,150; New Orleans, \$5,300; Washington, \$5,500.

E. T. Baranum Wire and Iron Works, Detroit, Mich.—Chicago, \$590.34; Philadelphia, \$1,238.95; New Orleans, \$3,272.04; Washington, \$3,449.52.

Charles O. Brown, Paterson, N. J.—Chicago, \$666; Philadelphia, \$1,018; New Orleans, \$2,713; Washington, \$3,112.

Globe Iron Works, Chicago, Ill.—Chicago, \$427.48; Philadelphia, \$922.62; New Orleans, \$672.20; Washington, \$3,456.20.

J. W. Bessell, Hoboken, N. J.—Chicago, \$950; Philadelphia, \$1,639; New Orleans, \$3,540; Washington, \$4,518.

George F. Gelbach, Philadelphia.—Philadelphia, \$1,574.80.

Atina Iron Works, Chicago, Ill.—Chicago, \$810.

Chicago Wire and Iron Works, Chicago, Ill.—Chicago, \$614.33; Philadelphia, \$1,317.43; New Orleans, \$3,539.62; Washington, \$3,732.84.

MEMPHIS, TENN.—The following is an abstract of the bids for fire-proof covering for the public building.

Ottawa Tile Company, \$390 (accepted).

The Wight Fire-proofing Company, \$400.

Mike McLaughlin, \$400.

MONTGOMERY, ALA.—The following is a synopsis of the bids for plastering the court-house:—

Joseph Eastman, \$4,196 (accepted).

B. W. Lloyd, \$4,300.

Smith & Grimp, \$4,363.

James Hughes, \$4,843.

M. T. Ford, \$5,200.

Brinfield & Conwill, \$7,160.

Figh & Williams, \$10,550.

NEW YORK, N. Y.—The following is an abstract of bids for furnishing and erecting two steam freight elevators, one in the Assay Office Building and the other in Public Stores Building, cor. Light and Washington Streets, New York City:—

Assay Office Building.
 Copeland & Bacon, \$2,466.

George C. Howard, \$2,721.

Otis Brothers & Co., \$2,725.

Whittier Machine Co., \$3,525.

Public Stores Building.
 George C. Howard, \$4,132.

Otis Brothers & Co., \$5,272.

Whittier Machine Co., \$5,760.

Copeland & Bacon, \$6,660.

All the first bids for furnishing freight elevator

for the Assay Office and the Public Stores Building in New York have been rejected, and new proposals re-invited.

ST. LOUIS, MO. — The following is a synopsis of bids received for glass for post-office screens, skylight, ceiling, for the custom-house: —

Drey & Kahn, \$1,049.25.

French Silvering and Ornamental Glass Company, \$1,301.30.

Edward A. Boyd & Son, \$1,422.73.

F. A. Drew Glass Company, \$1,537.06.

Semon, Bache & Co., \$1,750.

Healy & Millet, \$1,887.

John Gibson, \$2,201 and \$2,920.

George H. Gibson & Co., \$2,687.

The contract for the glass for post-office screens, skylight ceiling, etc., for the custom-house, etc., has been awarded to the French Silvering and Ornamental Glass Company, the lowest formal bidder.

TOPEKA, KANS. — The contract for gas-fixtures for the public building has been awarded to Gibson de Kosenko & Co., of Philadelphia, the lowest bidders. The bids are as follows: —

Gibson de Kosenko & Co., Philadelphia, \$3,336.

Cornelius & Co., Philadelphia, \$1,185.15.

Horn, Pfeffer & Brauner Manufacturing Company, Philadelphia, \$3,908.40.

R. Hollings & Co., Boston, \$3,349.

Mitchell, Vance & Co., New York, \$4,113.65.

Cox Sons, Buckley & Co., New York, \$6,849.50.

WASHINGTON, D. C. — List of proposals received by General M. C. Meigs, supervising engineer and architect, for furnishing forty iron castings, about \$2,000 pounds, for abaci of columns and pilasters in new Pension Building: —

Haugh, Ketcham & Co., Indianapolis, Ind., \$1,061.

James Perrotet, Columbia, Pa., \$1,066.40.

Bullders' Iron Foundry, Providence, R. I., \$1,690.

Bullders' Iron Foundry, Providence, R. I., \$1,280; joints not planed.

Fras. B. Bauman, Pottsville, Pa., \$1,280.

W. O. Hickock, Harrisburg, Pa., \$1,673.60.

Snead & Co. Iron Works, Louisville, Ky., \$1,100.

Wm. H. Jackson & Co., New York, \$1,230.

J. L. Marsbank & Sons, Harrisburg, Pa., \$1,000.

Bowler & Co., Cleveland, O., \$900.

Bartlett, Hayward & Co., Baltimore, Md., \$1,840.

E. N. Gray & Co., Washington, D. C., \$1,700.

Howell & Swetan, Brooklyn, N. Y., \$1,280; Telegram, \$520, a mistake; \$1,280 by letters received December 4, 1883.

Beckham & Middleton, Washington, D. C., \$1,120.

John T. Springman, Washington, D. C., \$1,120.

George White & Co., Washington, D. C., \$1,474.

Healey Iron Works, Brooklyn, N. Y., \$2,357.

Phoenix Iron Company, Trenton, N. J., \$2,200.

Joseph Hall & Co., Richmond, Va., \$1,376.

Received December 4, 1883.

Jonson Foundry and Machine Co., New York, \$1,800. Received December 4, 1883.

General Notes.

ABERDEEN, D. T. — The Rev. G. A. Brandt, of the Presbyterian church at Aberdeen, has a proposition from a prominent minister at Chicago to build a university at Aberdeen; that if the citizens of Aberdeen contribute the grounds and erect buildings to cost \$10,000, an endowment fund of \$100,000 will be assured.

ATTLEBORO, MASS. — Mr. F. J. Sawtelle, of Providence, is architect of the new Horton Building.

BEDFORD, IND. — Mr. Webber, Superintendent of the Chicago and Bedford Stone Company, has notified the cutters that if any of them went to work after the first of December, they must go as non-union men, as he positively would not recognize the union any longer. The cutters called a meeting and decided to strike. The union has over sixty members.

BROWN'S VALLEY, MINN. — Mr. Knott, of Morris, is to build a \$10,000 hotel at Brown's Valley.

BURLINGTON, Vt. — Norcross Bros., of Worcester, Mass., have contracted to build the Billings Library. The exterior will be of Longmeadow sandstone, and the cost is to be \$100,000.

EAST PROVIDENCE, R. I. — Mr. Henry D. Andrews is building a cottage on Russell Ave.

The needed excavation for St. Mary's Orphanage has been begun, but the stone-work may not be completed until spring, though much will depend upon the weather.

FALL RIVER, MASS. — Fall River is to have a \$30,000 Masonic building.

The Osborn mill corporation is building a one-sty storehouse, 80' x 180'.

The project of erecting a new cotton mill here is assuming shape.

FRANKFORD, PA. — A. F. Burke is building a three-sty double-house at Fox Chase.

GALVESTON, TEX. — Jos. Labadie, Esq., is building a two-sty brick house; cost, \$6,000; plans by Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

GREEN SPRING VALLEY, (BALTIMORE CO.), MD. — Messrs. Wyatt & Sperry, architects, Baltimore, are preparing drawings for Randolph Mordecai, Esq., for a three-sty stone and frame country residence, 55' x 90', to be erected in this valley.

HARLEM, N. Y. — A Young Men's Christian Association building in Harlem is projected.

IRVINGTON-ON-HUDSON, N. Y. — Palliser, Palliser & Co., of Bridgeport, Conn., have purchased the Harman estate of 150 acres laid out in a park in this village, and will commence at once the erection of 50 stone mansions for New York city merchants, bankers, etc.

KANSAS CITY, MO. — E. L. Young, five buildings, two sty, lots 33 and 34, block 1, Dundee Pl.; cost, \$3,500 each.

Western Sash and Door Company, two-sty frame building, s e cor. Nineteenth and Wyoming Sts.; cost, \$5,000.

A. M. Sill, 2 two-sty brick residences, Troost Ave., Dundee Pl.; cost, \$2,500 each.

KREX VALLEY ADIRONDACKS, N. Y. — Dr. Julius Sachs and Dr. I. Adler, of New York city, are having large picturesque bungalows erected here for summer use; Palliser, Palliser & Co., architects, Bridgeport, Conn. and New York.

LAWRENCE, L. I. — A frame house to cost \$8,500 is to be built for Miss Browning; from designs of Mr. H. Edwards-Ficken, of N. Y.

LOWELL, MASS. — It is reported that New York capitalists are planning to erect an immense rolling mill near the intersection of the Framingham & Lowell Railroad, and the connecting branch of the Lowell & Andover.

NARRAGANSETT BAY, R. I. — A villa in the old English style is to be built for Mr. A. Campbell; from designs of Mr. Carl Pfeiffer, of N. Y., to cost \$10,000.

NASHVILLE, ILL. — H. C. Adams, two-sty frame cottage; cost, \$2,500; from plans etc., by Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

NEW HAVEN, CONN. — A special committee of the City Council recommends that a committee of nine be appointed by the mayor, to receive subscriptions to the amount of \$75,000, for a public library building, provided the \$50,000 appropriated for a soldier's monument can be secured for this purpose.

PIERRE, D. T. — J. K. Graves, a Dubuque, Io., millionaire, has made a proposition to the citizens of Pierre to build a \$30,000 hotel, if they will give him a bonus of \$5,000. The offer of Mr. Graves has been accepted.

PROVIDENCE, R. I. — New buildings and improvements in the city of Providence, R. I., this year, have caused an expenditure of \$1,063,110, which is a slight increase over that of 1882.

PUBLIC WORKS. — The following is a list of bills, petitions, etc., relating to public works which have already been introduced in Congress: —

For marine hospital at city of New York.

For public building at Waco, Tex.

For public building at San Antonio, Tex.

For public building at Carson City, Nev.

For public building at Lacrosse, Wis.

For public building at Greenville, S. C.

For purchase of site for public building, San Francisco, Cal.

For public building at Camden, N. J.

For public building at Lexington, Ky.

For purchase of ground and the erection thereon in the city of Washington of a building to be used as a hall of records.

For public building at Jacksonville, Fla.

For public building at Key West, Fla.

RADNOR, PA. — Cottage for Rev. H. R. Percival, will be built from plans by Wilson Bros. & Co., architects, Philadelphia.

READING, MASS. — C. M. Cheney, 8-room cottage; cost, \$2,000; Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

RICHMOND, IND. — Two-sty brick and stone store for Mrs. Johns; cost, \$8,500; John A. Hasecoeter, architect.

RICHMOND, VA. — House near the city, for Randall Maynard, Esq.; cost, \$4,000; Albert L. West, architect.

Mansard roof and other improvements on business house of O. F. Winger & Co., Governor St.; cost, \$1,500; Albert L. West, architect.

ROCHESTER, N. Y. — Plans for the new Government building prepared by N. & C. S. Ellis, of this city, have been accepted, and work on building will be commenced soon. Building to be three-sty, 133' on Church St., by 109' on Fitzhugh St., with a tower 31' square. Materials will be gray sandstone with greenstone finish, red-tile roof. First floor occupied by post-office; second floor, custom-house and internal revenue office; third floor, court-rooms; estimated cost, \$450,000.

Plans are being prepared by Jas. G. Cutler, architect, for a church at cor. of Park Ave. and Meigs St., for the East Ave. Baptist Church Society; estimated cost \$50,000. Building to have a seating capacity of 700, to be built of brick and terra-cotta in Romanesque style.

ROSEMONT, PA. — Stable for J. H. Converse, Esq., from plans by Wilson Bros. & Co., architects, Philadelphia.

SALINE, KANS. — The Baptist Society is building a church.

SAXONVILLE, MASS. — It is the intention to rebuild the Saxonville Mills at once, and, if possible, to have them running within six months.

SINGAC, N. J. — H. L. Bridgman, Esq., of New York city will build 2 cottages here; Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

SOUTH LANCASTER, MASS. — The Seventh-Day Adventists have voted to raise \$25,000 for buildings for their school, which is to be known as the South Lancaster Academy. The work will begin at once.

SOUTH SEAVILLE, N. J. — C. McAllister will build a country house from plans by Hazlehurst & Huckel, architects, Philadelphia, Pa.

SPRINGFIELD, MASS. — A Springfield citizen has offered \$25,000 as the nucleus of a fund to build a well appointed hospital, outside of the city's jurisdiction.

STAFFORD SPRINGS, CONN. — A new brick block, two-sty and a basement, will soon be erected on the old site of Col. Warren's block, William N. Flynt & Co., of Monson, being now engaged upon the plans.

TRENTON, N. J. — A stock company is forming for the building of a masonic temple, the capital being fixed at \$125,000.

WASHINGTON, PA. — Frame house; cost, \$2,500; Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

WELLESLEY HILLS, MASS. — Mr. E. A. P. Newcomb, of Boston, is the architect of a house and stable now being built at Wellesley Hills, for Mr. E. D. Chamberlain; cost about \$20,000.

WESTPORT, CONN. — Mr. E. R. Lambert, architect, of Bridgeport, has designed the new Episcopal church for this town; cost, \$30,000.

PROPOSALS.

FURNITURE.

COLLECTOR'S OFFICE, [At Boston, Mass.] December 21, 1883.

Sealed proposals will be received at this office till Monday, the 7th day of January, 1884, at 12 o'clock, m., for the construction and placing in position of the furniture to be used in the rotunda of the custom-house at the port of Boston, in accordance with plans and specifications on file in the office of the Collector.

The right is reserved to reject any or all bids.

ROLAND WORTHINGTON, Collector.

PROPOSALS.

tion of the furniture to be used in the rotunda of the custom-house at the port of Boston, in accordance with plans and specifications on file in the office of the Collector.

The right is reserved to reject any or all bids.

ROLAND WORTHINGTON, Collector.

SCHOOL-HOUSE.

[At Piqua, O.] Piqua, O., December 21, 1883.

Bids will be received by the Board of Education of the city of Piqua, Miami County, O., for the erection of a High-School Building, until 12 o'clock, m., Saturday, February 3, 1884.

Plans and specifications for the above can be seen at the office of W. R. Brown, s w cor. Ninth St. and Broadway, Cincinnati, O., till January 1, 1884, after which time they can be seen at the office of the Clerk of Board of Education, in City-Hall Building, Piqua, Ohio.

The Board reserves the right to reject any or all bids.

By order of Board of Education.

F. A. HARDY, Clerk of Board.

IRON RESERVOIR.

[At North Attleboro, Mass.]

The North Attleboro Fire District will receive proposals until January 15, 1884, for the construction of a wrought-iron compensating reservoir for the North Attleboro Water-Works.

Plans and specifications can be obtained of the undersigned, who reserve the right to reject any or all proposals.

F. G. PATE, Water Commis-

F. S. DRAPER, sioners.

E. G. PRATT,

420

COLLEGE-BUILDING.

[At Lexington, Mo.]

Sealed proposals will be received by the undersigned at the office of E. Winsor & Son, Lexington, Mo., until 12 o'clock, Tuesday, January 15, 1884, for the erection and completion of additions to Central Female College, Lexington, Mo.

Bids will be received on part or on the whole; contractor to file an approved bond for full amount of contract.

The Board reserves the right to reject any or all bids. Plans and specifications may be seen at the office of E. Winsor & Son, or at office of M. Fred. Bell, architect, Fulton, Mo.

The above work is to be completed by August 15, 1884.

WM. MORRISON,

E. WINSOR,

J. D. CONNOR,

E. KYLAND,

W. F. KEDOLFF,

420

BRIDGE MASONRY.

[At Anoka, Minn.]

Sealed proposals will be received by the building committee, at the office of the County Auditor, Anoka, Minn., until 10 o'clock, p. m., of January 15, 1884, for furnishing the materials, and building the pile and timber foundations, and stone piers and abutments, for the bridge over the Mississippi River at Anoka, Minn., said work to consist of three piers and two abutments.

The bidders receiving the contract will be required to furnish satisfactory bond to the amount of one-third of the contract price.

Plans and specifications may be obtained from either of the undersigned after January 3, 1884.

The building committee reserves the right to reject any or all bids.

M. K. FROST,

Chairman Building Com., Anoka, Minn.

CHAS. F. LOWETH, Engineer,

419

OFFICE-BUILDING.

[At Fortress Monroe, Va.]

POST QUARTERMASTER'S OFFICE,

FORT MONROE, VA., December 14, 1883.

Sealed proposals, in triplicate, subject to the usual conditions, will be received at this office until 12 o'clock noon, on the 22d day of January, 1884, at which time and place they will be opened in presence of bidders, for furnishing all materials and erecting one brick office-building at Fort Monroe, Va.

Plans and specifications for this work, with detailed information relating thereto, will be furnished on application to this office. Proposals exceeding the sum of \$1,500 will not be considered. The Government reserves the right to reject any or all proposals. Envelopes containing proposals should be marked "Proposals for Office-Building at Fort Monroe, Va." and addressed to the undersigned.

D. D. WHEELER,

Captain and A. Q. M., U. S. A.

420

IRON BRIDGE.

[Near Cleaves, O.]

COUNTY AUDITOR'S OFFICE, HAMILTON CO., O.,

CINCINNATI, December 28, 1883.

Sealed proposals will be received at the office of the Commissioners of Hamilton County, O., until Saturday, January 20, 1884, at 12 m., for building a bridge across the Miami River, near Cleaves, O.

The superstructure will be of iron, and composed of three equal spans. Distance from face to face of abutments, 294 feet. Masonry will consist in building two piers and two abutments.

All work to be done according to the plans, specifications and profile now on file in the office of said County Commissioners.

Separate bids will be received for masonry, superstructure and piers, or the job complete.

The successful bidder only will be required to give security.

The Commissioners reserve the right to reject any or all bids.

J. W. BREWSTER,

County Auditor.

421

THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT.

No. 19.

SATURDAY, JANUARY 5, 1884.

VOLUME XV.
No. 419.

WATER-TIGHT FLOORS.

DOUBTLESS many of our readers have noticed in our columns an advertisement of "Dolbeare's Water-tight Wood Floors," but in the multiplicity of inventions offered to the public it may not have attracted the attention its merits deserve. The inventor and patentee, Mr. William L. Dolbeare, of Boston, has had a large experience in making water-tight floors by the old method of caulking. The objections incident to that plan, to wit, the strain on the walls of buildings so treated, induced him to devise some better arrangement. It is well known that in cities economy of space requires that the stalls in large stables should be built on the second story. The floors must then be made absolutely tight. By Mr. Dolbeare's method this is done cheaply and perfectly; there is no strain on the walls; nothing is used to impair the durability of the wood; on the contrary, his preparation tends to preserve it. The truth of this statement is shown by the fact that it has been applied to horse-car and other stables to the extent of eighty-six thousand square feet within the last year, and in every case has given perfect satisfaction. The use of this floor should by no means be confined to stables. Warehouses, factories, hotels, or any building where valuable property or furniture is stored, can, by the use of Dolbeare's invention, be secured from damage by water thrown into the upper stories in case of fire. In nine cases out of ten, more damage is done by water than fire. By a simple arrangement of waste-pipes the rooms on one floor might be flooded without injuring even a frescoed ceiling on the next below it. Any kind of fancy floor can be laid over the water-tight one when desired.

We recommend all who contemplate building to correspond with Mr. Dolbeare, who will promptly furnish the fullest information.

Address,
W. L. DOLBEARE,
ATLANTIC AVE., FORT HILL WHARF, BOSTON.

METALLIC DECORATIONS.

ONE of the most marked evidences of the high degree of cultivation among our people is their now almost universal desire to surround themselves, whether at their homes or in their places of business, with objects calculated to add to their comfort and convenience, and no less calculated to please the eye and gratify the artistic sense, more or less developed in every one.

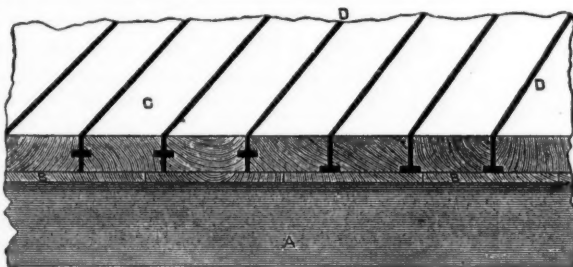
The time when a house was only expected to provide a roof for protection from storms,

and walls to guard against the cold, has passed away. The home of to-day must not only afford the greatest possible combination of material comforts, but it must also offer such attractions as will render it beautiful. Our eyes are no longer satisfied with ungraceful outlines and with bare walls; our houses must now provide objects upon which the eye may rest with pleasure, and in which the mind may find some artistic gratification. To meet these ever-increasing demands and requirements, our architects and artisans have long devoted much thought and labor, and they promptly avail themselves of every possible aid in their work. For interior house decoration, paper, cloth, wood, leather, and many other natural and manufactured materials have been largely and more or less satisfactorily employed. Only lately have the various metals been devoted to these purposes, and that only to a limited extent, because of the difficulties encountered and the expense involved in the manipulation and manufacture of these more

natural or other objects and designs, at a comparatively low cost, in any of the above metals. The manifold forms of animal and vegetable life, the most beautiful subjects for art imitation, can thus be permanently and exactly preserved, with the most minute and perfect detail. A leaf fluttering in the wind, a bird poised in mid-air, or a beautiful and fragile flower may be perpetuated for all time, for the constant pleasure of those who find these objects charming and interesting in themselves, and even more so when in a permanent form they add new beauties to our homes, our places of business, or transient abodes.

A very great demand for the work of the Tahanto Company has already been developed, and the articles are being put into the market as fast as is possible, the present facilities for manufacture being pressed to the utmost.

TAHANTO MANUFACTURING CO.,
42 BATTERY-MARCH ST., BOSTON, MASS.



Dolbeare's Water-tight Floor.

stubborn materials; but their imperishable character renders them especially desirable for the purposes contemplated.

In this line of art-work most satisfactory results have now been attained by the Tahanto Manufacturing Company, of Boston, Mass. This corporation, with the aid of some new and original processes under its control, has entered upon the manufacture of every kind of interior decoration in metals, after new designs, and also in reproductions of designs heretofore only practicable in wood, plaster, paper, or leather. Much beautiful work has already been done and is in use, in the form of panels, plaques, friezes, dados, and mural decorations of great variety in silver, brass, bronze, copper and other metals, or in combinations of two or more of them, and all these at so low a cost as to ensure the possibility of very general and extended application.

Further, by certain peculiar processes, also controlled by the company, it is enabled to reproduce, with the most remarkable fidelity,

SEYSSSEL ROCK ASPHALTE ROOFS.

THE use of Seyssel Rock Asphalte for fire-proof roofs has been adopted by so many of the leading architects in New York city that we have published for the information of members of the "American Institute of Architects" and "American Society of Civil Engineers," a treatise on the use of

Rock Asphalte with a translation of the last paper of M. Léon Malo on the subject. Some of the later roofs laid by us are the "Barcelona" and "Madrid," on Fifty-eighth Street, and the "Gorham Building," Broadway and Nineteenth Street; and we have also been awarded the contract for covering all the floors and the roof of the "American Bank Note Co.'s Fire-proof Building" on Church Street, with Seyssel Rock Asphalte (about 200,000 square feet).

In the treatise we mention that although we have only roofs to show here which have been laid twelve years, we have documents to show that the advantages of the roof were appreciated in Europe so far back as 1835, which, however, as showing its antiquity, pales before the fact that in *Genesis* we read of its being used in the masonry of the Tower of Babel. We have also called attention to its sanitary advantages, mentioning the fact that our Berlin agent was presented with a gold medal by the Prince Imperial, at the Berlin Hygienic Exhibition, 1883.

Any information on the advantages of Seyssel Asphalte for sidewalks, court-yards, stables, hospitals, etc., we shall be glad to afford.

E. H. WOOTTON,
35 BROADWAY, NEW YORK.
Compagnie Générale des Mines d'Asphalte.

LEATHER SUBSTITUTE.

A VISIT to the office and warerooms of the Evans Artificial Leather Co. in Boston, by me last week was very enjoyable, and much to my surprise I was shown articles made up from the goods of above-named company that completely deceived me, as I thought real leather was the thing used.

A buggy was shown trimmed with it, and the side, and back curtains, and top made from the same goods. It was certainly very handsome, and I could not believe it was an imitation of leather. I was also shown pocket-books and ladies' street-bags made out of an imitation of alligator-skin, a very fine imitation indeed; also music-rolls, slippers, the tops of ladies' shoes, side-stays, and button-pieces lined with these goods, taking the place of sheepskin, and which are very extensively used by the boot and shoe trade.

The chairs in the office are very nicely upholstered with this imitation leather, and the demand for it by upholsterers is continually increasing. The Company are about getting out embossed goods in a variety of designs adapted for furniture, as well as lambrequins and interior decorations.

The uses to which this leather may be put are simply marvellous; in fact it may be used as a substitute for the real article, from a cheap skiver to the best furniture leather made, and will give perfect satisfaction.

It is the best as well as the most costly substitute for leather in the world, no expense having been spared by the Company to make it so, and it can in many cases be used where all other imitations of leather fail, and have to be discarded.

It is perhaps unnecessary to add that samples will be cheerfully forwarded by the Company on request, on stating for what purposes desired.

A visit to warerooms and office when in Boston would amply repay those interested in working leather.

OBSERVER.

The above article is the outgrowth of a visit to our store in the early part of December last, by a large jobber of leather from Cincinnati, O.

THE EVANS ARTIFICIAL LEATHER CO.

INVISIBLE WATER-PROOFING PROCESS.

THIS water-proofing process, for walls of buildings, now so extensively used in St. Louis and elsewhere, has been in use in Europe in a modified form upwards of sixteen years, and in this country in a vastly improved shape since June, 1879, and in all this time has never failed either here or abroad. In this country it has been applied to buildings in Chicago, Milwaukee, Denver, Omaha, Kansas City, New York and St. Louis, where a number of buildings have been treated with success. The process consists in permanently closing up the pores of the brick, treated with an imperishable compound forced into them by heat, applied after the walls are erected. The method of application is to heat the wall

to be treated to the depth of one-quarter to one-half inch, evaporating any humidity which it may contain, rendering it more absorbent, and causing the water-proofing material to remain in a melted or liquid state until it can be absorbed into the pores, in which, after penetrating as deep as the brick has been heated, it gradually hardens, and thus fills them permanently without showing on the surface or altering the appearance more than dampening it with water would do. Its effects are to render the surface to which it is applied very hard and durable; to prevent disintegration, by preventing the entrance and subsequent evaporation of moisture; to preserve the mortar-joints, by making it impossible for rain-water, charged with sulphurous acid from the coal-smoke through which it has fallen, to combine with the mortar, forming sulphate of lime, which the next rain-drop would dissolve; to prevent the staining of the walls from soot and dust being carried in to them by the rain-drops, which ordinarily soak in and carry in whatever may be upon the surface, thus producing the unsightly stains so common to our handsomest edifices, by preventing their absorption and causing each drop of water, as it strikes and runs down the wall, to act as a cleanser, carrying off each its modicum of dust and soot. This process has been heartily endorsed by all who have had occasion to try it, as may be learned by numerous testimonials from architects, scientists, Government officials and owners of buildings throughout this country and England. Mr. C. Shaler Smith, Consulting and Bridge Engineer at St. Louis, and others equally well known, whose names appear to their testimonials, recommend the process very highly. Applied to stone it keeps it clean, and prevents all disintegration.

The directions for water-proofing are as follows:—

In water-proofing, the apparatus required for the purpose consists of a swinging stage, a stove and case, a charcoal box, a melting pot, two hooks and a lot of brushes. The stage is put together as follows:—

Take boards one inch thick, of any desired length, and wide enough to fit the stage irons; put the bottom irons down, one at each end of the boards and lay the boards upon them, bolting them to the irons with bolts and nuts; then hook two of the end irons at each end, one on each side; then put a bar 2" x 4" through the loops on the outside of the irons, bolting it at both ends to the irons, then bolt on the foot-board upright against the irons, and to this and the rail fasten the two brackets to hold the stove-case and charcoal box one-quarter from each end of the stage. Onto these brackets hang the charcoal box and stove case, run the hooks of the falls through the loops in the end irons and the stage is then ready to swing in the usual manner. Then fill the stove with charcoal, light it and put it in the case, put material into the melting-pot and light the lamp under it. Put the socket hook on an ordinary hoe-handle, then hang the stove on it, resting the end of the handle on the bottom of the stage and against the foot. Let the stove hang against the wall for a few moments until the brick becomes uncomfortable to touch with the back of the hand, then move the stove to the left, lapping the part heated, about three or four inches, and heating the fresh part while the brush man applies the water-proofing material, drawing his brush across the part already heated from the stove to the right, not too fast, holding the handle up and the ends of the bristles down and against the wall, until the brick looks slightly damp, then the stove

is moved again, and the same thing repeated until the end of the stage is reached. Then begin at the right of the stage, a stove-width lower down, lapping the part done an inch or two, and so on. To heat in a corner, put the stove straight across it. Where there are weather-stains brush the places well with a stiff dry brush before treating it. Cover up all stones with damp sand or cloths to prevent dropping the hot material on it and spotting it. To protect paint from the heat of the stove put between it and the stove a shield made of asbestos, riveted to a sheet of sheet-iron. Striping the mortar-joints after treating the wall very much improves its appearance.

To clean and treat limestone: Scrub with the cleaning mixture, then sponge off with clean water, and while wet apply the neutralizing fluid; then, when thoroughly dry, apply the water-proofing compound with a clean brush several times in succession, so as to saturate the stone with it.

For sandstone, scrub well with concentrated lye, dissolved in water and soft soap, sponge off with clean water, let dry thoroughly, and saturate with the water-proofing compound.

To renovate with stain: Stir it thoroughly from the bottom (shaking will not do) and apply like paint with a brush. All joints which are defective should first be pointed up. Heating the wall slightly will cause the stain to go on uniformly. In case a white efflorescence appears on brick after treating it, sponge it off with coal-oil.

THEODORE HUNT,

413 NORTH TWELFTH ST., ST. LOUIS MO.

"STAR" PORTLAND CEMENT.

MR. HENRY REID, the author of "The Science and Art of the Manufacture of Portland Cement," in his "Practical Treatise on Natural and Artificial Concrete and its Varieties and Constructive Adaptations," referring to the "Star" Works product, says, on page 204:—

"The reputation which Messrs. Toepffer, Grawitz & Co. have acquired in Germany and other places proves that the principle they have adopted is the right one. They make a Portland cement, regardless of the sacrifices involved in its honest and careful production, and thus they know its irreproachable quality, and have no hesitation in guaranteeing it to be what they represent, and expect to be paid for accordingly.

"There is the startling fact before us that German Cement has been sold in London and elsewhere in England, and of such a quality as to show indisputably that our English makers have still a great deal to learn about their business." And on page 308:—"The author has had recent opportunities for a thorough examination of this 'Star' Portland Cement, from having been employed by Mr. Gustav Grawitz in London during the winter of 1878-79. From the tests made and the results obtained, there can be no question about the correctness of the encomium passed upon it by General Gillmore and the jury of the Philadelphia Exhibition."

TESTING DEPARTMENT FOR BUILDING MATERIALS AT THE ROYAL INDUSTRIAL ACADEMY.

35 KLOSTER STRASSE, BERLIN, October 25, 1879.

"The Patent Victoria Stone Company (Limited), in London, on September 19, 1879, ordered a cement to be tested from a sample received here on September 23, 1879, without mentioning the origin of the sample.

"At the request, dated September 28, 1879, of Mr. Gustav Grawitz, in London, who stated

of the largest structures now under way. In Chicago, the floors of the mammoth warehouse being built for the National Tube Works Co. are all being laid with the H. W. Johns Manufacturing Co.'s asbestos, and the new depot for the Western Indiana Railway Co. is lined with this excellent material.—*Inland Architect and Builder for December.*

Nothing in the World like it.

The Decorator and Furnisher.

An elegantly printed and illustrated monthly paper, treating of every part of the

Furnishing and Decorating of the interior of the house.

Among the writers and artists contributing for the coming year will be:—

John La Farge, Miss Mary Gay Humphrey,
Benn Pittman, Mrs. T. M. Wheeler,
Miss M. E. Tillinghast, Mrs. M. E. Haweis,
Henry B. Wheatley, E. W. Foley,
and many others.

"Not only the most imposing, but certainly the most artistic publication and the highest in merit that has seen the light here."—*N. Y. Com. Advertiser.*

"Established as a well-edited and most useful periodical."—*N. Y. Times.*

"It is made up wholly of original matter and that of the best quality."—*Chicago Inter-Ocean.*

"A piece of high art. * * The finest we have seen of late, even in Paris."—*American Register, (Paris).*

"America possesses nothing that lives in the same atmosphere. * * It is standard."—*Boston Times.*

"Handsomely printed, with numerous designs for decoration and furnishing."—*Christian Union.*

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whose judgment, criticism, and comments on everything pertaining to public health, drainage, and sanitation are accepted as an authority, during its ten years of life has effected many reforms, cultivated and educated the people to a department of life that indifference, heedlessness, carelessness and ignorance were making disastrous, and accomplished more good by its decisive, quiet work, than all other sanitary papers in the country put together.—*Hydraulic and Sanitary Plumber.*

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113 FULTON STREET,
NEW YORK.

Architects, Builders, and others will confer a favor on the Publishers by mentioning "The American Architect and Building News" when sending for circulars or corresponding with parties advertising in these columns.

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EDITION DE LUXE.

THE undersigned beg to announce the publication of an entirely new edition of the works of THOMAS CARLYLE, the first complete uniform edition issued in America.

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It will be completed in twenty volumes, octavo, uniform in size and style with the recent *éditions de luxe* of Hawthorne and Emerson, and will be printed from new type at the celebrated University Press, Cambridge, on parchment linen drawing paper made expressly for the purpose.

The illustrations will consist of *proof impressions* of etchings, steel engravings and photogravures, including fine portraits, historical views, etc., all executed in the highest style of art.

It is intended to issue two volumes per month, beginning in January and continuing until completed. Subscriptions received for complete sets only. Price \$5.00 per volume.

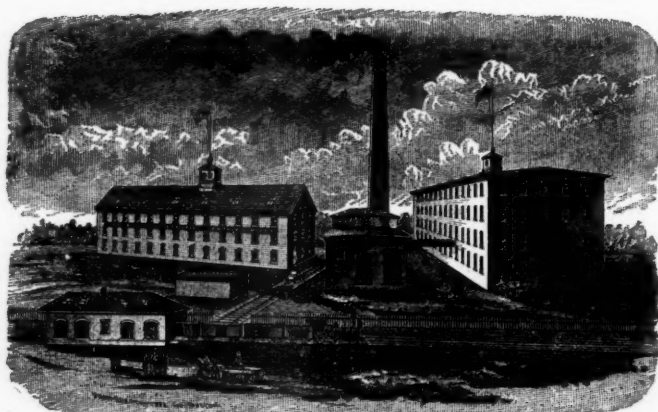
Although the first volume has not yet been issued, nearly the whole edition has already been subscribed for, and but very few more subscriptions can be received.

Book collectors and others desiring to secure the remaining sets should apply at once to their local bookseller or to the publishers.

Prospectus and specimen pages sent on application to

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Is called to the new improved substitute for leather. Resembling as it does the real article in appearance and durability, it is fully guaranteed to give perfect satisfaction for covering chairs or seats for

Opera or Club Houses, Private or Public Dining or Billiard Rooms,

And the seats and backs of Church Pews,

and in fact to take the place of real leather in all cases. For decorative purposes it is used for Lambrequins, Panels, Screens, &c., &c. It is made in all colors and in seal and alligator grain, also embossed in a variety of designs.

Send for Samples, stating for what purpose it is wanted.

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Walter N. Dole, - - - Gen'l Agent.

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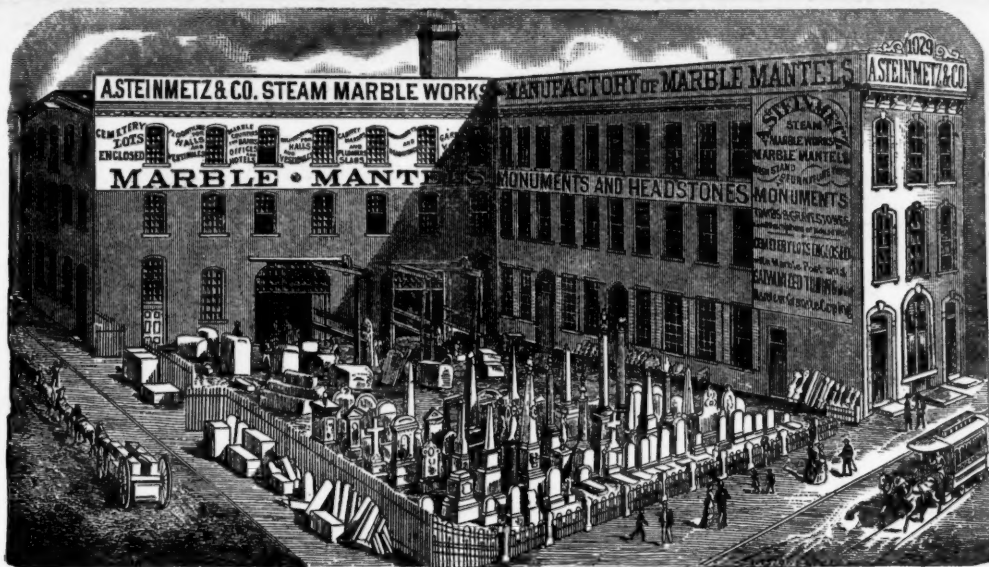
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The above cut shows the method of fastening our wire cloth lathing with our
PATENT WIRE STAPLE FASTENING,
for permitting even and sufficient penetration of plaster through the wire lathing.

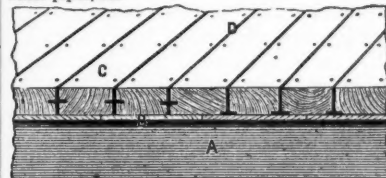
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TRENTON, N. J.

DOLBEARE'S Water-Tight Wood Floors.

Architects and Builders will find in Dolbeare's Water-Tight Wood Floors an improvement long sought for, combining lightness, durability, and absolute water-tight qualities. For horse-car, livery, and private stables, it is rapidly taking the place of caulking or concreting. For slaughter-houses, currier's shops, factory floors, bridges, etc., it is highly recommended. In first-class stores, hotels, and public buildings, by the use of this floor it is absolutely impossible for goods or ceilings to be damaged by water leaking through the floor in case of fire, bursting of water-pipes, etc.



Patented June, 1882.

In the above cut an end or sectional view is shown B representing a 7-8 matched boarding on Floor Timber, A, C showing a 3-inch planking with 3-8 Rabbetting or Grooving (this can be laid in thickness from 1 inch, upwards), and D showing the Filling in the seams, applied hot, which, when set, is thoroughly adhesive to the wood and sufficiently elastic to allow for any ordinary shrinking, swelling or settling.

Orders respectfully solicited, and personally attended to, by addressing

W. L. DOLBEARE,

Atlantic Avenue, Fort Hill Wharf, Boston.
MIDDLESEX HORSE RAILROAD COMPANY.
BOSTON, June 14, 1882.

W. L. DOLBEARE, Esq.

Dear Sir:—It affords us pleasure to recommend your process for "Making Floors Absolutely Water-Tight." In our new Bunker-Hill Stable, where we have stalls on three floors (one directly over the other), it has given the most perfect satisfaction, and makes no extra strain upon the walls of the building, as would be the case if the old method of "Caulking" was resorted to. In very many respects I regard your floor as very much superior to any caulked floor. Very truly, **CHARLES E. POWERS, Pres**

SAMUEL D. KELLEY, ARCHITECT.

Boston, June 21, 1882.

W. L. DOLBEARE, Esq.

Dear Sir:—I have used Dolbeare's Improved Water-Tight Wood Floors for stable purposes to the extent of about fourteen thousand (14,000) square feet, and they have given complete satisfaction. I consider it superior to caulking or other Improved Water-Tight Floors. Yours, &c.,

SAMUEL D. KELLEY.

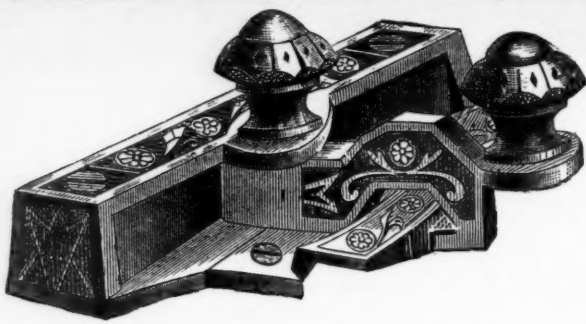
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