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THE joint select committee appointed to consider the subject of providing better accommodation for the two houses of Congress and for the Congressional Library, has presented its report, or rather, two reports, since their deliberations did not lead all the members to the same conclusion. The majority consider, in brief, that the need of a new building for the library is immediate and imperative. They believe that great improvement might be made in the Senate and Representative halls, but think that the consideration of these should be postponed until the more pressing necessities of the library are provided for; and unanimously advise the erection of a separate building for this purpose, in preference to any attempt at enlarging the Capitol in the hope of accommodating it properly. They call attention to the fact that the library, if properly shelved, would already occupy completely either the Senate or the House wing, and its rapid increase would soon make even this space insufficient, as may be seen from the example of the French National Library, which, although no larger than ours must soon become, now occupies a territory of nearly four acres, while the total area of the Capitol is only three and one-half acres. As to the site for the new building, the majority of the committee think that the most eligible situation would be the square lying east of the Capitol Park, but this tract would have to be purchased from private owners at a cost of about a million of dollars, and they regard it as unwise to make this outlay so long as there remain public reservations which could be occupied without expense. The most suitable of these public sites they consider to be Judiciary Square, and therefore recommend its use for the purpose. The minority report, signed by Senator Morrill, disagrees with that of the majority only in regard to the last item. He, like his colleagues, regards the site east of the Capitol as far superior in every respect except cost to Judiciary Square, but he considers that the difference in expense should not be allowed to outweigh the advantages which would be permanently secured by adopting it.

WE have received an important issue of the *Proceedings of the Royal Institute of British Architects*, containing the regulations which have been drawn up and approved by the Council for the compulsory examination, which all candidates for membership in that body will, after May, 1882, be required to have passed before they can be proposed for election. The regulations are drawn up with great care, and the examinations, although it is not intended to make the test severe at first, will probably be thorough. To save time and trouble, each candidate is obliged, in applying for admission to the examination, to submit plans, elevations and sections of a building designed by himself, with one sheet of details, a perspective drawing, and a sketch of some ornament, from the round. These drawings must be properly authenticated, and as a guarantee of good faith on the part of the applicant, he is obliged to deposit a fee of three guineas. A glance at this “probationary work” is sufficient to determine whether the candidate is fitted for further examination. If not, his fee is returned to him, and he is ex-

cluded from the subsequent trials, which are intended as tests of proficiency both in the theory and the practice of architecture, and occupy four days. The first day is devoted to a written examination on the history of the art, to be illustrated by sketches; the second to materials and construction; the third to professional practice, in which the candidate is required to make plans, specifications and estimates in accordance with a given programme. The fourth day is occupied with an oral examination covering the same ground as the previous work. Those who answer correctly a given proportion of the questions are eligible for Associates of the Institute, and if elected within eighteen months after passing the examination, their deposit of three guineas is credited as their entrance fee.

THE voluntary examinations which have for some years been held under the auspices of the Royal Institute of British Architects, for the benefit of those who desired to test their own proficiency and obtain an authoritative certificate of their professional attainments, cover much the same ground as the examination which all candidates for membership in the Institute will soon be required to pass, and may perhaps be regarded as essentially similar. The papers in the written part of the voluntary examination of May, 1880, have been published, and we hope to have space in a week or two to print them in full. Most of our readers, particularly the younger members of the profession, will find them interesting, and we hope many of them will be disposed to try their hands at writing answers to the questions. Very few, we imagine, will be entirely successful, but if those who fail take pains to inform themselves upon the points wherein their knowledge is at fault, the exercise will have been of lasting benefit to them.

ABOUT once in every twenty-four hours, at this season, some house, church, school-house, or hotel is destroyed by fire originating from what is called in the newspapers a “defective flue;” and yet it never seems to occur to any one to inquire further into the particular character of the defect. The phrase is so common, and so unmeaning, that it has come to be accepted as referring to a kind of inexplicable and unavoidable disorder to which buildings are subject, without fault on the part of any one. Perhaps owners or underwriters will some time find it for their interest to investigate such occurrences, and we can assure them that the study will be interesting as well as profitable. To say nothing of chimneys built upon the floors, or carried obliquely through houses on a cradle of wooden beams, most of those who are familiar with country building will recollect instances of recklessness in dealing with such matters which seem little short of criminal, and with them the feeling that each successive announcement of a conflagration from “defective flues” arouses is less of wonder at the calamity than of surprise that so many of our ordinary wooden structures should still be standing. One of the most recent cases in point is that of a church at Canton, Ohio, in which the worshippers at communion service were disturbed by a crackling over their heads, apparently in the concealed space between the roof and the plastered ceiling, followed by a burst of fire downward through the ventilators, which opened from the church into this air-space. As the account naively says, the congregation went out so quietly that “only a few were bruised,” but the flames followed them to the very door, and before the fire department reached the spot nothing could be done except to save the neighboring buildings.

A VERY serious explosion took place recently at Newburyport, Mass., in a shop used for the manufacture of what is called “lignoid,” apparently a cheaper form of celluloid, and made, it is said, in a similar manner. Every one knows the explosive character of this substance, which is a compound of gun-cotton and camphor, and it is not surprising that the passage of a nail, which was thought to have fallen in some way into the material, through the rollers by which it was being moulded into shape, was sufficient to cause the detonation of the mass, setting the building on fire and fatally injuring three men. It is rather surprising, in view of the numerous explosions which have already taken place in manufactories of this class of products, that the owners of the building had been able to obtain policies of insurance to the amount of fifteen thousand dollars, which will cover all their loss.

A SLIGHT interruption was caused the other day to the working of the steam-heating pipes laid through the streets of Hartford, by the leakage of rain-water and melting snow into the junction boxes. As might be expected, the condensation caused by the abstraction of so great an amount of heat as would be absorbed by the melting snow was considerable, and the pressure in the pipes was so reduced as to prevent the use of the steam for motive power, although it appears that the heating action was not seriously interfered with. On the whole, the occurrence may be considered to have given evidence of a satisfactory degree of reliability in the system. Such leakages can without much difficulty be guarded against for the future, and the knowledge that even if they should occur they will not necessarily injure the heating capacity of the pipes is in itself of value.

THE New York Chamber of Commerce has obtained leave to erect a statue of Washington on the steps of the Sub-Treasury, on Wall Street, once the Merchants' Exchange where the first President of the United States took the oath of office in 1789. As a position for a statue, the place is singularly well adapted. The front of the building looks directly down Broad Street, and with its marble portico, raised at the top of a lofty and spacious flight of steps, forms a conspicuous object from various points; and anything placed in front of it would attract attention from a considerable distance. The work has not yet been entrusted to any particular sculptor, and it is possible that a competition may be instituted. The New York *Times* gives the names of those American artists whom it thinks capable of carrying out such a commission with credit; among them Messrs. H. K. Browne, J. Q. A. Ward, Augustus Saint-Gaudens, and Olin L. Warner. We think several others might be added to the list, but no doubt their claims will be advanced in due season. It is to be hoped that the example set by Mr. Browne in his Union Square statue, and later by Mr. Saint-Gaudens in the monument to Farragut, now being erected in Madison Square, of associating architects with them to aid them in designing the accessories, will be followed in this case. We have already examples enough of sculptured figures dropped apparently at random on the grass, or nestling modestly under bushes, and in the present case a dignified treatment is doubly necessary lest the statue should appear insignificant in comparison with its imposing surroundings.

A SINGULAR case is reported from San Francisco, which involves some important legal points. A Mrs. Carpenter, according to the account given in the New York *Tribune*, owns a house on Stockton Street, adjoining a block of stores now in process of construction. The owner of the stores carried his excavations so far below the basement of Mrs. Carpenter's house that she was compelled to underpin her wall with fourteen feet of new work, at great expense, as her unfriendly neighbor refused to allow her workmen to "trespass," as he called it, on his side of the line. Not content, however, with claiming merely what he supposed to be his rights, as soon as the buildings were well advanced, he began to encroach upon hers, by laying a new sidewalk seventeen inches beyond the proper boundary, in order to create a presumption that the division line between the two lots coincided with that of the sidewalk. Mrs. Carpenter's niece was the first to resist this proceeding by threatening the contractor with a pistol, whereupon he fled for protection to the police, and had the young lady arrested for assault. As soon as his enemy was out of the way, he ventured forth again, and recommenced the construction of the sidewalk, one of his men deliberately placing a slab of stone on the foot of Mrs. Carpenter's maid, who was trying to hold possession of the disputed strip. Triumphant over this second foe, who was taken from the field severely injured, the victorious aggressor was about to complete the work, when Mrs. Carpenter interfered in person, and throwing herself down on the ground defied the laborers to proceed. A crowd gathered, and the circumstances having been explained, guards were set to defend the lady's property, until legal measures could be taken for a definite settlement of the question. Meanwhile, it has been found out that the rear wall of the stores encroaches upon Mrs. Carpenter's land, and she has notified the owner to remove it. At the last accounts, he was endeavoring to negotiate a compromise. We should say that he had involved himself in serious difficulties. To say nothing of the inexcusable assault upon the poor servant-girl, he was probably wrong in refusing to allow Mrs. Carpenter's workmen to

enter his territory in order to underpin the wall. The *droit d'échelle*, by which any person is entitled to occupy a certain portion of his neighbor's land, with ladders or other apparatus for the purpose of repairing his own walls, whenever it may be necessary, is well defined in the French law, and we presume is incorporated in the common law of most other nations, so that unless Mr. Ewing can show that the presence of the men on his property would have done him some injury, it is quite possible that he may be called upon to repay the extra expense which was thrown upon Mrs. Carpenter by his churlish conduct.

ALREADY the competition so successfully carried out by the National Board of Trade, through the medium of the *Sanitary Engineer*, has brought forth practical results in the shape of a well-drawn bill to prevent the adulteration of food or drugs, which is to be presented to Congress at once, and its enactment secured if possible. The bill of course differs from any of the drafts offered in competition, but probably owes some of its comprehensive clearness to the thorough manner in which the field was covered by those essays. At least, whatever the source of its inspiration, the proposed law is a model of its kind. The United States having no direct jurisdiction over offences committed within a State, the bill only provides penalties for the sale of adulterated articles within the Territories, the District of Columbia, or Government dock-yards, arsenals and reservations, and for their importation or transportation into or from any State; but these limitations will not materially diminish the usefulness of the law, even if the individual States should neglect to supplement it by enactments applying similar provisions to their own territory. The duty of examining articles of food or medicine is entrusted to the National Board of Health, which is empowered to employ analysts for the purpose, and also to recommend suitably qualified persons to the Secretary of the Treasury for appointment as special inspectors and public analysts at such ports of entry as he may deem expedient. Reports of the results of analyses are to be published in the weekly bulletin of the National Board of Health, and provision is made for prosecution of offenders. The penalty for violation of the law is a fine not exceeding fifty dollars for each offence, and any tampering with drugs or articles of food, either in reducing their quality or strength by admixture of harmless substances, or in the substitution of injurious articles, is regarded as a violation. There seems to be no reasonable objection to the passage of such a bill, while great good may well be expected from it. The thoughtful care which marks every sentence of the draft is particularly shown in the last section, which provides that the act shall take effect ninety days after its passage, thus allowing sufficient time for dealers and manufacturers to reform their methods of business, if there should be need.

THE *Iron Age* mentions a decision of the Supreme Court of Pennsylvania, regarding the liability of a certain corporation — the Keystone Bridge Company of Pittsburgh — for injuries received by two of its workmen while employed in constructing a roof at the company's works. The plaintiffs were laborers, working under direction of a certain Wymond, in placing the iron rafters on the building. A trussed plank was used in setting up the roof, and while the two men were carrying a rafter along this plank it gave way, throwing them to the ground. The question seems to have turned on the relation of Wymond to the men who were injured. If he was the agent of the corporation, and as its representative furnished the plank for the workmen to walk on, he, and the corporation through him, would be liable for damage caused by its defective character. The lower court held that he was to this extent the agent of the corporation, and ordered a verdict for the plaintiffs, but the Supreme Court has reversed this decision on the ground that the evidence did not show Wymond to be in such a way the representative of the defendants as to make them responsible for his acts of negligence. The plank was not furnished by the corporation, nor had any directions or instructions in regard to it been given to Wymond, but he himself, with the help of two other workmen, had made it in the way they thought proper. To this extent Wymond was simply a fellow-workman with the plaintiffs, and his or their error of judgment could not give ground for liability as against the corporation for the injuries of the plaintiffs. The distinction appears to be a very nice one, but the position taken by the higher court is at least reasonable.

VENTILATION.¹

GENTLEMEN,—I have been asked to address you on the subject of ventilation, perhaps in the hope that I might be able to announce something new, or at least illuminate by a clearer light what is believed by many to be almost hopelessly obscure. You may have heard it said that Science has not condescended to investigate the nature of this essential of life, and to formulate its laws, or if it has, the attempts to make its mysteries less obscure have had the effect of throwing doubt on the conclusions. Science appears humiliated by the negative results of practical ventilation, whose nature, it is charged, is variable, and oftener rebellious than subject to the laws which ought to govern it.

I need hardly tell you there could not be a greater mistake than to suppose that these accusations are true. Very far from it, indeed. Ventilation and the allied art of heating have been exhaustively investigated, and their laws formulated; the literature of these arts is already very copious, and every year has new additions, which, from the abundance of facts, tend to be rather historical than elementary. Such being the case, I cannot hope to tell you any new thing, but must content myself with a humble effort to show some things which are overlooked, and some mistakes which are made. But first I want to say a word in defence of Science, and another in reproach of those who in her name have perpetrated the blunders of ignorance, and so explain to you the causes of failure in practical ventilation.

There are two kinds of knowledge: first-hand knowledge, or that obtained slowly but thoroughly by personal experience, and often with great material waste, as every experimentalist knows; and second-hand knowledge, or that found in books or heard in lectures. Name any art you please, and you will refuse to believe that any one can be a "dabster" at it who has merely read and studied about it in books. Information so acquired has no vitality; it resembles real knowledge in the same way that a statue of stone is like an active man; it is only an image of an isolated fact, or a fixed combination of facts, incapable of presenting a new idea, and unfit to adapt itself to new circumstances. Real knowledge is like elastic life; if not familiar with every new circumstance, at least able to adapt itself to every change and combination of conditions, which it recognizes as merely old facts in novel arrangement. Such knowledge costs a great deal of time and money to get, besides unlimited patience and application, but it is the only kind which will not mislead.

How many architects, physicians, house-owners, scientific men even, have hastily read some book about ventilation which was probably compiled by a professional man with no personal knowledge of the matter, during the hours of an enforced leisure, and have undertaken to ventilate and spoil an otherwise perfect structure? What would you say of a man who, having read, for example, Dana's "Two Years Before the Mast," should assume the responsibility of navigating a ship around the world? Would you excuse such a man who, when he had wrecked his ship, attributed his mishap to the mistakes and errors of the books of reference and nautical tables which navigators always use? You would not only not excuse him, you would not hesitate to accuse him of gross folly in undertaking a great responsibility in a matter in which he had no practical experience. Yet how many of us have done such a foolish thing, and when the results were disastrous, was Science, or our masters, or our ignorance to blame? If I succeed in nothing more than in impressing upon you the importance of vital knowledge on this subject, I shall be satisfied. Real knowledge is the strength of genius, and imparts to it also all of the confidence and much of the energy, without which success is unattainable.

As you know, an intimate knowledge of the nature and properties of materials used in construction, especially if combined with some skill in working them, is as certain to contribute to artistic design as it is to sound construction. I was once looking over some plans with an experienced builder (we mechanics sometimes presume to criticize the design of the work laid out for us), and saying that they pleased me, the builder replied: "Ah, he's an architect who knows how to handle brick and stone." I should have understood him just as well had he said: "This design really facilitates the construction, and makes it interesting to the workmen."

It is a rooted belief with the profane vulgar that the function of the architect is to draw plans; few care for his ability in design, none value his knowledge and choice of materials or skill in construction. He is merely an agent, employed because he knows how to get the most work for the least money, look after the contractors, and save the owner trouble in other ways. Every architect, however, feels his responsibility in the very particulars where he has popularly the least credit, namely, his knowledge and skill. You are anxious to have the public know that the architect's responsibility is both a great one, as it surely is, and that it is cheerfully and proudly assumed, and I understand the object of this association to be to increase the knowledge and raise the standard of the profession, and, not least of all, to establish its true relations with the people, together with a clear understanding of its responsibilities and duties. To this end, it is needful that the house-owner should have that confidence in the architect's ability which is derived from evidence of his practical knowledge. To one client who is able to appreciate a design, you will have a dozen utterly unable to catch the spirit of your drawing; but on the other hand, to one who is satisfied with

your construction and sanitary arrangements, you will have a dozen who will never forgive your mistakes or omissions in the departments of heating, ventilation and plumbing.

Now, it is these practical matters which are best understood by the man who is going to build a house, rather than the artistic and æsthetic, and if the architect could meet his client on his own ground and overwhelm him with his practical knowledge on these subjects, he would compel respect.

In what I have already said, I trust you will not suppose I would waste a single minute's time in an unnecessary and uncalled for argument about the importance of knowledge. That, of course, was all taken for granted beforehand. But I think I have shown that ignorance and inexperience are as much to blame for what is unsatisfactory in ventilating as in other work, and that it is the duty of every architect to increase his knowledge of the subject by personal observation and experiment. Perhaps you are saying: "As if we hadn't enough to do already." Believe me, I fully appreciate the multitude of subjects with which the architect must be familiar, and the great variety of knowledge he must have, to say nothing of a carefully cultivated artistic sense. It is my regard for the profession which has led me to point out a direction in which it should strengthen itself with its clients, and add to its knowledge for the credit of science. This last is the sacred duty of every educated man.

But there are other causes of failure in ventilating work besides the inexperience and ignorance of designers,—the incompetence of the mechanics and neglect of the architect to superintend his work. It may be possible to provide for most contingencies in the plans and specifications, but often the success of ventilation depends upon an attention to insignificant details at the proper time. It is not so much a question of quantities of materials to be purchased at the lowest price, and put in position as rapidly as possible, as it is of skill in arrangement and distribution of parts, to simplify the whole, to increase the effectiveness of every detail, and finally to see that it all works as expected, and if it does not, to spend sufficient time and thought to discover the fault. Time so spent is not lost, as you will find in subsequent work.

As I said at first, it is hardly possible that I can say anything new about ventilation; but if I shall have succeeded in simplifying some of its obscurities and attracting you to the subject, I shall be fully repaid by the pleasure of the work.

I will ask your attention for a short time to a consideration of the relations of an ordinary dwelling-house to the atmosphere. As far as the air is concerned, no house can be regarded as an enclosure. It is an aggregate of porous materials immersed in air. Granted that the doors and windows are air-tight, the structure itself, although an obstacle to the free movement of the air, is so only in a degree. If the walls are of brick, with bare plastered inner walls, there is a considerable movement of air through them; if they are of marble or granite, or if the inner walls are painted or papered, the movement is almost entirely hindered. So it is if the walls are wet by rain. If the earth under it is of gravel or sand, and dry, there will be tolerably free communication between the inner and outer air; if it is wet or of clay, there will be no movement. An unfavorable condition for these unseen and unfelt but none the less existing movements of the air would be a house built of stone founded on clay, having a close texture, with painted walls, a metal roof, and in a moist climate. A favorable condition would be a brick house, bare walls, a gravelly soil, a dry climate. It is a well-established fact that consumption is more prevalent where houses are built on a close, wet soil, than in houses on dry gravel. It is supposed that there is a connection between the disease and a humid soil, or rather that it is the humidity which is the cause. Now, I believe it has never been pointed out that the humidity is the cause simply because it prevents the movement of air through the soil to the house. The chimneys of the former house, even if planned with the utmost skill, will half of them work badly, while those of the brick house will work well, unless constructed and disposed in the most thoughtless manner. In the tight house there is no admission of air to replace that needed to supply the chimneys; in the other this is provided for by the volume of air leaking in or diffusing through the walls. The tight house can only supply its strongest flues by streams of air drawn down the weakest ones. The supply of air by way of the walls and soil is of course very dependent upon meteorological conditions, and will be as variable as the weather itself. Such ventilation is simply better than none at all, and ought not to be counted upon in any well-considered scheme. As far as the plans are concerned, a definite supply of air should be provided for, regardless of the perviousness of the walls.

During the heating season, when the house is supposed to be closed to the outer air, the building is in fact a chimney. If any room with a fireplace is kept tightly closed and separate from the others, then it with its chimney forms a separate chimney, and if there is a sufficient accidental or designed supply of cold air to the room, the chimney will draw. But the rooms of a house are most often in free communication, by means of stairways and corridors, and as the flues are all connected together by the contained air of the house they in fact form the outlets, more or less long and numerous, of a large chimney, the house itself. The contained air, being warmer than the outer and superincumbent air, is lighter, and in a state of unstable equilibrium; that is to say, it is in a condition to change places with the colder air above it.

It is easier for the air to enter the house at its lowest point, if an inlet is provided, and so supply all the chimneys, rather than to

¹ A paper read at the Fourteenth Annual Convention of the American Institute of Architects, by Mr. Frederic Tudor.

descend by way of the weaker flues. Such an inlet may be the cold-air box of a furnace, or there may be a number of them, each entering the separate rooms by way of a heating-chamber at the back of the grate. For a private house, the cold-air box and furnace are the best; for an apartment-house, the latter. Grates, which having a heating-chamber at the back afford a supply of fresh warm air, heat better than a common grate, and require less fuel, besides securing a positive draught, are found in many forms. In Paris about one-quarter of the new apartment-houses have them. Here, where the hot-air furnace is the instrument for supplying air, they have gone out of use and are forgotten, although in Franklin's time and as a result of his invention and reputation they were popular. People often say they cannot endure furnace heat and prefer open fires. Franklin proved that the common open fire is unsuitable and inadequate. It must have a supply of air from some source, which had better be by way of a good furnace. Notwithstanding a free supply of air to the house, some of the chimneys will draw better than others. To make them draw alike, the conditions should be made similar. The flues should be carried up to a height above all the roofs and other objects, which in connection with the wind might have an influence upon them. They should be topped out separately, each flue in the stack having an independent termination, and as far as possible similar exposure to the wind, because if all end on the top of the chimney, those on the windward side will have a preference and interfere with the others. The sides of the flues should not be plastered with mortar, for this decays and peels off. The best flue is of glazed earthenware; next to that is one of fire-brick. In France, the universal chimney-flue consists of tiles having a rectangular section with rounded corners, rabbeted joints, and with flanges on the outside for secure bonding into the walls. The draught in the ordinary brick flues which we are accustomed to is impaired by an excessive flow of cold air into them, along with the smoke. There should be a slide in every chimney-throat to prevent this and to equalize the draught in the several flues of the house. The slide or valve should have a rod and handle to control it, where they will always be in sight. Another cause of poor draught is the excessive leakage into the flues of cold air through the walls of the chimneys and from unused flues. The French system avoids this by using a practically air-tight material; consequently the flues there are much smaller. For high chimneys and long flues, 6 inches square is large enough; in all other cases, 6 inches by 8 inches, and 8 inches by 10 inches. Here we should be obliged to use, on account of our imperfect construction, flues 8 inches by 12 inches, and 12 inches by 12 inches.

Chimneys ought not to be built in the outer walls, that is, if built for use. Some architects use them only as decorative features, and if for that reason the chimney must be in an outer wall, it ought to be protected by a space between the flues and the outside surface filled with some good non-conductor like mineral-wool or dry coal-ashes. As a rule, much skill and expense will be required to make such a chimney a good one, and the danger is, that if built chiefly for artistic effect, its more important function of removing smoke and aiding ventilation will be quite overlooked and unprovided for; and while the ungrateful client will probably be soon forgetful of the beauty of the design, he will be forever grumbling about his smoky chimneys. Fortunate it is for the profession that the long-suffering public believes the evil of smoky chimneys an incurable one, and therefore to be endured. While there are external difficulties which cause bad draught, the architect is more often responsible.

A dwelling-house provided with suitable chimneys to ventilate the rooms in connection with a supply of fresh air requires little more to be done in the direction of ventilation. There ought to be outlets at the ceiling level to take off the gases of combustion from lamps and burners, and to allow the more heated and higher air to escape when the rooms are crowded by company. I think it is generally better to provide small outlets and leave them permanently open. There is a loss of heat by this plan, but it has the important advantage of simplicity. The dining-room should have a large outlet at the ceiling level, and it should be where it can be seen and managed. The kitchen ought to have a large ventilating flue 12 inches by 12 inches or 16 inches, arranged in connection with a hood over the range. Remember, the accumulation of heat in kitchens is always in excess of what is needed to keep the room comfortable for a working person; consequently the occupant will open the windows, affording the outer air easy access to the whole house. The fresh air will therefore pour in and waft along with it fragrant clouds from the range. Arrange an outlet so powerful that it will carry off the heated air as fast as formed. The existence of such a flue is a blessing in summer.

As for the water-closets, the most rabid sanitarians would have them excluded from houses altogether, or at least placed in detached wings, with abundant supplies of fresh air. That is not always a good plan. Besides the architectural inconvenience of devoting a separate structure or wing to this purpose, the air from the closets will eventually get into the house, for any fresh air admitted to them will escape in the direction of the least pressure, namely towards the big chimney or house, bringing along with it the very foul air which it was intended should be excluded. I think it is a better arrangement to place the water-closets in the very middle of the house, with no special supply of air except what is borrowed from the halls and corridors. Provide them with well arranged outlet flues, and you will have a movement of air from the house towards the closets; they will form as it were part of the outlet shafts or foul-air ducts, as they are sometimes called. If a house is well ventilated the air thrown

away can hardly be called foul, however. It is only so by comparison with very pure air.

Referring again to the porous nature of building materials and soil, and the continual flow of air through the walls, consider for a moment the nature of some of the enclosed spaces of the house, other than rooms, closets and halls. If the house is in Boston, it will probably have no cellar, but under the basement floor will be a space about two feet high, the ground perhaps covered with a concrete consisting of nine parts sand and dirt, one part cement. This will be damp, it may be wet from the tide, and covered with decaying chips and rubbish left by the builder, in which may be distinguished the innumerable tracks of vermin. The drain-pipes are probably disconnected from the iron and lead pipes coming from sinks, etc., upstairs, and there are pools of sewage, or streams of sewer-air pouring in. Or, if the owner has already discovered and remedied such a danger, his neighbors may have neglected to see that their drains are all right, and through the loosely laid and imperfectly jointed rubble foundation-walls foul air is flowing in. The cold-air box of the furnace is probably built up against the party-wall which forms one side of it, and as the proprietor is apt to close the valve at the mouth of the inlet, either to save coal or to suit the power of his furnace, the vile air presses in from the other side of the wall through the joints and rat-holes, to supply the hot-air pipes of the furnace. If you are willing to go farther, you will see that the plastered walls are furred off from the brick party-walls, leaving continuous air-spaces convenient for fire, rats and stench to reach the upper part of the house. This is an unhappily common state of things; believe me, I am no hearsay witness. I have personally examined so many of these respectable looking houses, that I never enter one without painful sensations, so fearful am I of encountering something disgusting and dangerous to health. If this is all wrong somebody is to blame for it. The architect, contractor and speculator divide the honors. Most of these houses were built for sale ready-made, and brought good prices, owing largely to the architect's skill in arrangement and taste in design. The contractor and speculator, however, felt no need to concern themselves about details of construction which a confiding public would not be likely to criticize or examine, and as for the architect, he was the tool and cat's paw by whose poorly rewarded help the other men raked out the chest-nuts. The contractor and speculator got most of the money, which is their nature, and which a reasonable public will not complain much about; but the architect gets most of the blame, for which the public is always ready to seek occasion.

Houses which have dry cellars on a good foundation are in much better condition, and neglect is not productive of such frightful consequences to the ventilation. Still, it must be said, people are very thoughtless about the condition of their cellars, which are largely used for the storage of decaying vegetables, and are receptacles for all kinds of refuse. This is not the architect's fault; when he has provided for light and circulation of air, and made all places accessible to the tidy housekeeper's broom and mop, his responsibility for the cleanliness of the place has ended.

HINTS ON HOUSE DECORATION.¹—III.

Now, hitherto we have not got further into the matter of decoration than to talk of its arrangement. Before I speak of some general matters connected with our subject, I must say a little on the design of the patterns which will form the chief part of your decoration. The subject is a wide and difficult one, and my time much too short to do it any justice, but here and there, perhaps, a hint may crop up, and I may put it in a way somewhat new.

On the whole, in speaking of these patterns I shall be thinking of those that necessarily recur; designs which have to be carried out by more or less mechanical appliances, such as the printing-block or the loom.

Since we have been considering color lately, we had better take that side first, though I know it will be difficult to separate the consideration of it from that of the other necessary qualifications of design.

The first step away from monochrome is breaking the ground by putting a pattern on it of the same color, but of a lighter or darker shade, the first being the best and most natural way. I need say but little on this as a matter of color, though many very important designs are so treated. One thing I have noticed about these damasks, that of the three chief colors red is the one where the two shades must be the nearest to one another, or you get the effect poor and weak; while in blue you may have a good deal of difference without losing color, and green holds a middle place between the two.

Next, if you make these two shades different in tint as well as, or instead of, in depth, you have fairly got out of monochrome, and will find plenty of difficulties in getting your two tints to go well together. The putting, for instance, of a light greenish blue on a deep reddish one, turquoise on sapphire, will try all your skill. The Persians practise this feat, but not often without adding a third color, and so getting into the next stage. In fact, this plan of relieving the pattern by shifting its tint as well as its depth, is chiefly of use in dealing with quite low-toned colors—golden browns or grays, for instance. In dealing with the more forcible ones, you will find it in general necessary to add a third color at least, and so get into the next stage.

¹ A paper read by William Morris before the Birmingham Society of Artists.

This is the relieving a pattern of more than one color, but all the colors light upon a dark ground. This is above all useful in cases where your palette is somewhat limited; say, for instance, in a figured cloth which has to be woven mechanically, and where you have but three or four colors in a line, including the ground.

You will not find this a difficult way of relieving your pattern, if only you are not too ambitious of getting the diverse superimposed colors too forcible on the one hand, so that they fly out from one another, or on the other hand too delicate, so that they run together into confusion. The excellence of this sort of work lies in a clear but soft relief of the form in colors beautiful each in itself, and harmonious one with the other, on a ground whose color is also beautiful, though unobtrusive. Hardness ruins the work, confusion of form caused by timidity of color annoys the eye, and makes it restless, and lack of color is felt as destroying the *raison d'être* of it. So you see it taxes the designer heavily enough after all. Nevertheless I still call it the easiest way of complete pattern-designing.

I have spoken of it as the placing of a light pattern on dark ground. I should mention that in the fully-developed form of the design I am thinking of there is often an impression given of there being more than one plane in the pattern. Where the pattern is strictly on one plane, we have not reached the full development of this manner of designing, the full development of color and form used together, but form predominant.

We are not left without examples of this kind of design at its best. The looms of Corinth, Palermo, and Lucca in the twelfth, thirteenth, and fourteenth centuries turned out figured silk cloths, which were so widely sought for, that you may see specimens of their work figured on fifteenth-century screens in East Anglian churches, or the background of pictures by the Van Eyks, while one of the most important collections of the actual goods is preserved in the treasury of the Mary Church at Dantzic; the South Kensington Museum has also a very fine collection of these, which I can't help thinking are not quite as visible to the public as they should be. They are, however, discoverable by the help of Dr. Rock's excellent catalogue published by the department, and I hope will, as the Museum gains space, be more easy to see.

Now to sum up: This method of pattern-designing must be considered the Western and civilized method; that used by craftsmen who were always seeing pictures, and whose minds were full of definite ideas of form. Color was essential to their work, and they loved it, and understood it, but always subordinated it to form.

There is next the method of relief by placing a dark figure on a light ground. Sometimes this method is but the converse of the last, and is not so useful, because it is capable of less variety and play of color and tone. Sometimes it must be looked on as a transition from the last-mentioned method to the next of color laid by color. Thus used there is something incomplete about it. One finds oneself longing for more colors than one's shuttles or blocks allow one. There is a need felt for the speciality of the next method, the dividing line, and it gradually gets drawn into that method; which, indeed, is the last I have to speak to you of, and in which color is laid by color. In this method it is necessary that the diverse colors should be separated by a line of another color, and that not merely to mark the form, but to complete the color itself; which outlining, while it serves the purpose of gradation, which in more naturalistic work is got by shading, makes the design quite flat, and takes from it any idea of there being more than one plane in it.

This way of treating pattern design is so much more difficult than the others, as to be almost an art by itself, and to demand a study apart. As the method of relief by laying light upon dark may be called the Western way of treatment and the civilized, so this is the Eastern and, to a certain extent, the uncivilized.

But it has a wide range, from works where the form is of little importance, and only exists to make boundaries for color, to those in which the form is so studied, so elaborate, and so lovely, that it is hardly true to say that the form is subordinate to the color, while on the other hand, so much delight is taken in the color, it is so inventive and so unerringly harmonious, that it is scarcely possible to think of the form without it—the two interpenetrate.

Such things as these, which, as far as I know, are only found in Persian art at its best, do carry the art of mere pattern-designing to its utmost perfection, and it seems somewhat hard to call such an art uncivilized. But, you see, its whole soul was giving up to producing matters of subsidiary art, as people call it; its carpets were of more importance than its pictures; nay, properly speaking, they were its pictures. And it may be that such an art never has a future of change before it, save the change of death, which has now certainly come over the Eastern art; while the more impatient, more aspiring, less sensuous art which belongs to Western civilization may bear many a change and not die utterly; nay, may live on its intellect alone for a season, and enduring the martyrdom of a grim time of ugliness, may live on, rebuking at once the narrow-minded pedant of science, and the luxurious tyrant of plutocracy, till change brings back the spring again, and it blossoms once more into pleasure. May it be so.

Meanwhile, we may say for certain that color for color's sake only will never take real hold on the art of our civilization, not even on its subsidiary art. Imitation and affectation may deceive people into thinking that such an instinct is quickening amongst us, but the deception will not last. To have a meaning and to make others feel and understand it, must ever be the aim and end of our Western art.

Before I leave this subject of the coloring of patterns, I must warn

you against the abuse of the dotting, hatching and lining of backgrounds, and other mechanical contrivances for breaking them; such practices are too often the resource to which want of invention is driven, and unless used with great caution they vulgarize a pattern completely. Compare, for instance, those Sicilian and other silk cloths I have mentioned with the brocades (common everywhere), turned out from the looms of Lyons, Venice, and Genoa, at the end of the seventeenth and beginning of the eighteenth centuries. The first perfectly simple in manufacture, trusting wholly to beauty of design, and the play of light on the naturally woven surface, while the latter eke out their gaudy feebleness with spots and ribs and long floats and all kinds of meaningless tormenting of the web, till there is nothing to be learned from them save a warning.

So much for the color of pattern-designing. Now, for a space, let us consider some other things that are necessary to it, and which I am driven to call its moral qualities, and which are finally reducible to two—order and meaning.

Without order your work cannot even exist; without meaning, it were better not to exist.

Now, order imposes on us certain limitations, which partly spring from the nature of the art itself, and partly from the materials in which we have to work; and it is a sign of mere incompetence in either a school or an individual to refuse to accept such limitations, or even not to accept them joyfully and turn them to special account, much as if a poet should complain of having to write in measure and rhyme.

Now, in our craft the chief of the limitations that spring from the essence of the art is that the decorator's art cannot be imitative even to the limited extent that the picture-painter's art is.

This you have been told hundreds of times, and in theory it is accepted everywhere, so I need not say much about it—chiefly this, that it does not excuse want of observation of nature, or laziness of drawing, as some people seem to think. On the contrary, unless you know plenty about the natural form that you are conventionalizing, you will not only find it impossible to give people a satisfactory impression of what is in your own mind about it, but you will also be so hampered by your ignorance, that you will not be able to make your conventionalized form ornamental. It will not fill a space properly, or look crisp and sharp, or fulfil any purpose you may strive to put it to.

It follows from this that your convention must be your own, and not borrowed from other times and peoples; or at the least, that you must make it your own by thoroughly understanding both the nature and the art you are dealing with. If you do not heed this, I do not know but what you may not as well turn to and draw laborious portraits of natural forms of flower and bird and beast, and stick them on your walls anyhow. It is true you will not get ornament so, but you may learn something for your trouble; whereas, using an obviously true principle as a stalking-horse for laziness of purpose and lack of invention will but injure art all round, and blind people to the truth of that very principle.

Limitations also, both as to imitation and exuberance, are imposed on us by the office our pattern has to fulfil. A small and often recurring pattern of a subordinate kind will bear much less naturalism than one in a freer space and more important position, and the more obvious the geometrical structure of a pattern is, the less it should tend toward naturalism. This has been well understood from the earliest days of art to the very latest times during which pattern-designing has clung to any wholesome tradition, but is pretty generally unheeded at present.

As to the limitations that arise from the material we may be working in, we must remember that all material offers certain difficulties to be overcome, and certain facilities to be made the most of. Up to a certain point you must be the master of your material, but you must never be so much the master as to turn it surly, so to say. You must not make it your slave, or presently you will be a slave also. You must master it so far as to make it express a meaning, and to serve your aim at beauty. You must go beyond that necessary point for your own pleasure and amusement, and still be in the right way; but if you go on after that merely to make people stare at your dexterity in dealing with a difficult thing, you have forgotten art along with the rights of your material, and you will make not a work of art, but a mere toy; you are no longer an artist, but a juggler. The history of the arts gives us abundant examples and warnings in this matter. Clear, steady principle, playing with the danger and falling into the snare, mark with the utmost distinctness the times of the health, the decline and the uttermost richness of art.

Allow me to give you one example in the noble art of mosaic. The difficulty in it necessary to be overcome was the making of a pure and true flexible line, not over thick, with little bits of glass or marble nearly rectangular. Its glory lay in its durability, the lovely color to be got in it, the play of light on its faceted and gleaming surface, and the clearness mingled with softness, with which forms were relieved on the lustrous gold which was so freely used in its best days. Moreover, however bright were the colors used, they were toned delightfully by the grayness which the innumerable joints between the tesserae spread over the whole surface.

Now, the difficulty of the art was overcome in its earliest and best days, and no care or pains were spared in making the most of its special qualities, while for long and long no force was put upon the material to make it imitate the qualities of brush-painting either in power of color, in delicacy of gradation, or intricacy of treating a

subject; and, moreover, easy as it would have been to minimize the jointing of the tesserae, no attempt was made at it.

But as time went on, men began to tire of the solemn simplicity of the art, and began to aim at making it keep pace with the growing complexity of picture-painting, and, though still beautiful, it lost color without gaining form. From that point (say about 1460), it went on from bad to worse, till at last men were set to work in it merely because it was an intractable material in which to imitate oil painting, and by this time it was fallen from being a master art, the crowning beauty of the most solemn buildings, to being a mere tax on the craftsman's patience, and a toy for people who no longer cared for art. And just such a history may be told of every art that deals with special material.

Under this head of order should be included something about the structure of patterns, but time for dealing with such an intricate question obviously fails me; so I will but note that, whereas it has been said that a recurring pattern should be constructed on a geometrical basis, it is clear that it cannot be constructed otherwise; only the structure may be more or less masked, and some designers take a great deal of pains to do so.

I cannot say that I think this always necessary. It may be so when the pattern is on very small scale, and meant to attract but little attention. But it is sometimes the reverse of desirable in large and important patterns, and, to my mind, all noble patterns should at least look large. Some of the finest and pleasantest of these show their geometrical structure clearly enough, and if the lines of them grow strongly and flow gracefully, I think they are decidedly helped by their structure not being elaborately concealed.

At the same time, in all patterns which are meant to fill the eye and satisfy the mind, there should be a certain mystery. We should not be able to read the whole thing at once, nor desire to do so, nor be impelled by that desire to go on tracing line after line to find out how the pattern is made, and I think that the obvious presence of a geometrical order, if it be, as it should be, beautiful, tends towards this end, and prevents our feeling restless over a pattern.

That every line in a pattern should have its due growth and be traceable to its beginning, this, which you have doubtless heard before, is undoubtedly essential to the finest pattern-work; equally so is it that no stem should be so far from its parent stock as to look weak or wavering. Mutual support and unceasing progress distinguish real and natural order from its mockery, pedantic tyranny.

Every one who has practised the designing of patterns knows the necessity for covering the ground equably and richly. This is really to a great extent the secret of obtaining the look of satisfying mystery aforesaid, and it is the very test of capacity in a designer.

Finally, no amount of delicacy is too great in drawing the curves of a pattern, no amount of care in getting the leading lines right from the first can be thrown away, for beauty of detail cannot afterwards cure any shortcoming in this. Remember that a pattern is either right or wrong. It cannot be forgiven for blundering, as a picture may be that has otherwise great qualities in it. It is with a pattern as with a fortress, it is no stronger than its weakest point. A failure, forever recurring, torments the eye too much to allow the mind to take any pleasure in suggestion and intention.

As to the second moral quality of design, — meaning, I include in that the invention and imagination which forms the soul of this art, as of all others, and which, when submitted to the bonds of order, has a body and a visible existence.

Now you may well think that there is less to be said of this than the other quality, for form may be taught, but the spirit that breathes through it cannot be. So I will content myself with saying this on these qualities, that though a designer may put all manner of strangeness and surprise into his patterns, he must not do so at the expense of beauty. You will never find a case in this kind of work where ugliness and violence are not the result of barrenness, and not of fertility of invention. The fertile man, he of resource, has not to worry himself about invention. He need but think of beauty and simplicity of expression; his work will grow on and on, one thing leading to another, as it fares with a beautiful tree. Whereas the laborious paste-and-scissors man goes hunting up and down for oddities, sticks one in here and another there, and tries to connect them with the commonplace; and when it is all done the oddities are not more inventive than the commonplace, nor the commonplace more graceful than the oddities.

No pattern should be without some sort of meaning. True it is that that meaning may have come down to us traditionally, and not be our own invention, yet we must at heart understand it, or we can neither receive it nor hand it down to our successors. It is no longer tradition if it is servilely copied, without change, the token of life. You may be sure that the softest and loveliest of patterns will weary the steadiest admirers of their school as soon as they see that there is no hope of growth in them. For you know all art is compact of effort, of failure, and of hope, and we cannot but think that somewhere perfection lies ahead, as we look anxiously for the better thing that is to come from the good.

Furthermore, you must not only mean something in your patterns, but must also be able to make others understand that meaning. They say that the difference between a genius and a madman is that the genius can get one or two people to believe in him, whereas the madman, poor fellow, has himself only for his audience. Now the only way in our craft of design for compelling people to understand you is to follow hard on Nature; for what else can you refer people

to, or what else is there which everybody can understand — everybody that it is worth addressing yourself to, which includes all people who can feel and think?

Now let us end the talk about these qualities of invention and imagination with a word of memory and of thanks to the designers of time past. Surely he who runs may read them abundantly set forth in those lesser arts they practised. Surely it had been pity indeed, if so much of this had been lost as would have been if it had been crushed out by the pride of intellect that will not stoop to look at beauty unless its own kings and great men have had a hand in it. Belike the thoughts of the men who wrought this kind of art could not have been expressed in grander ways or more definitely, or, at least, would not have been; therefore I believe I am not thinking only of my own pleasure, but of the pleasure of many people, when I praise the usefulness of the lives of these men, whose names are long forgotten, but whose works we still wonder at. In their own way they meant to tell us how the flowers grew in the gardens of Damascus, or how the hunt was upon the plains of Kirman, or how the tulips shone among the grass in the Mid-Persian Valley, and how their souls delighted in it all, and what joy they had in life; nor did they fail to make their meaning clear to some of us.

But indeed, they and other matters have led us afar from our makeshift house and the room we have to decorate therein, and there is still left the fireplace to consider.

Now I think there is nothing about a house in which a contrast is greater between old and new than this piece of architecture. The old, either delightful in its comfortable simplicity, or decorated with the noblest and most meaning art in the place; the modern, mean, miserable, uncomfortable and showy, plastered about with wretched sham ornament, trumpery of cast-iron, and brass and polished steel, and what not — offensive to look at and a nuisance to clean — and the whole thing huddled up with rubbish of ash-pan, and fender, and rug, till surely the hearths which we have been bidden so often to defend (whether there was a chance of their being attacked or not) have now become a mere figure of speech, the meaning of which in a short time it will be impossible for learned philologists to find out.

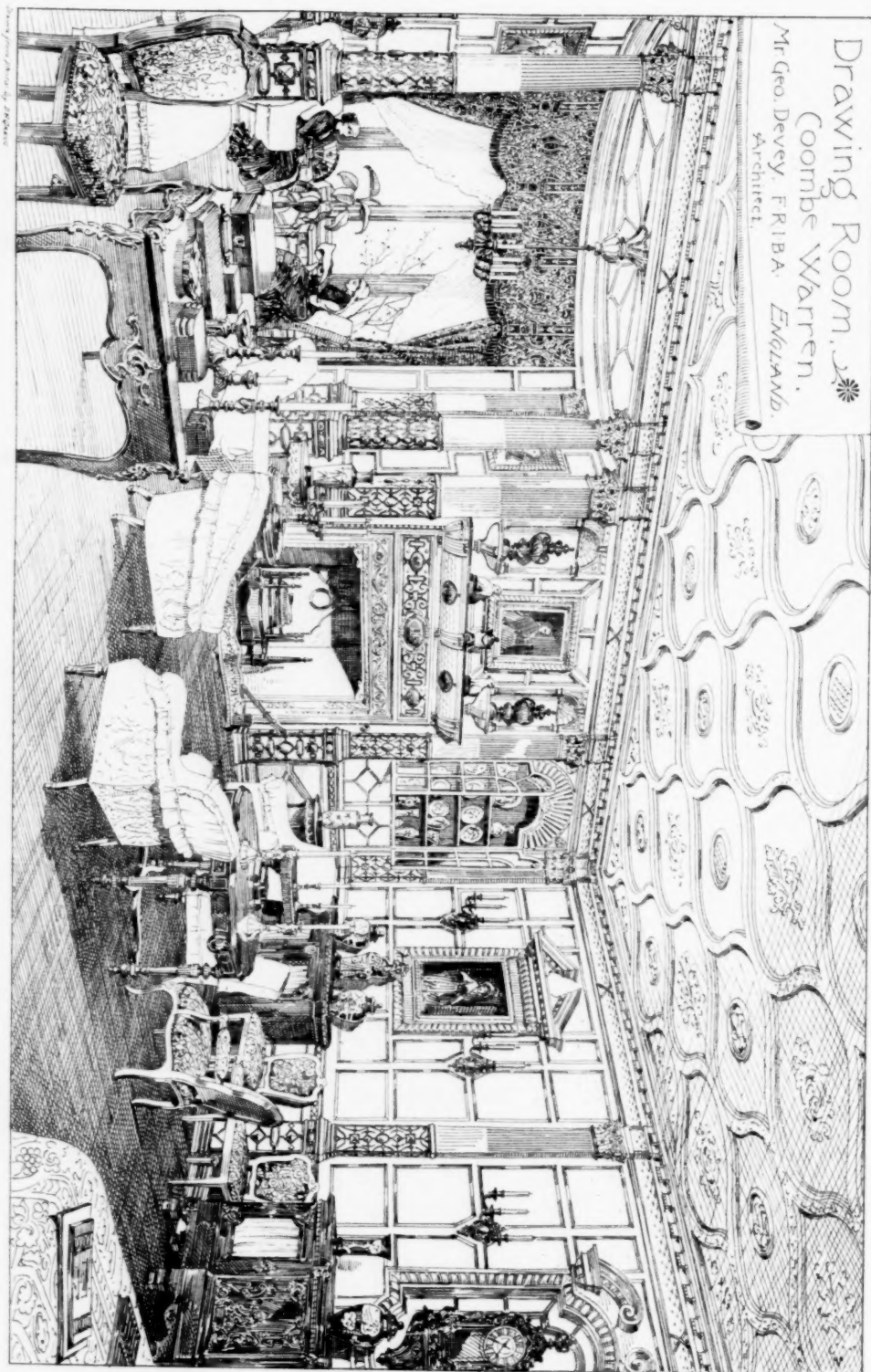
I do most seriously advise you to get rid of all this, or as much of it as you can without absolute ruin to your prospects in life; and even if you do not know how to decorate it, at least have a hole in the wall of a convenient shape, faced with such bricks or tiles as will at once bear fire and cleaning, then some sort of iron basket in it, and out from that a real hearth of cleanable brick or tile, which will not make you blush when you look at it, and as little in the way of guard and fender as you think will be safe; that will do to begin with. For the rest, if you have wooden work about the fireplace, which is often good to have, don't mix up the wood and the tiles together; let the wood-work look like part of the wall-covering, and the tiles like part of the chimney.

As for movable furniture, even if time did not fail us, 'tis a large subject — or a very small one — so I will but say, don't have too much of it; have none for mere finery's sake, or to satisfy the claims of custom; these are flat truisms are they not? But really it seems as if some people had never thought of them; for 'tis almost the universal custom to stuff up some rooms so that you can scarcely move in them, and to leave others deadly bare; whereas all rooms ought to look as if they were lived in, and to have, so to say, a friendly welcome ready for the incomer.

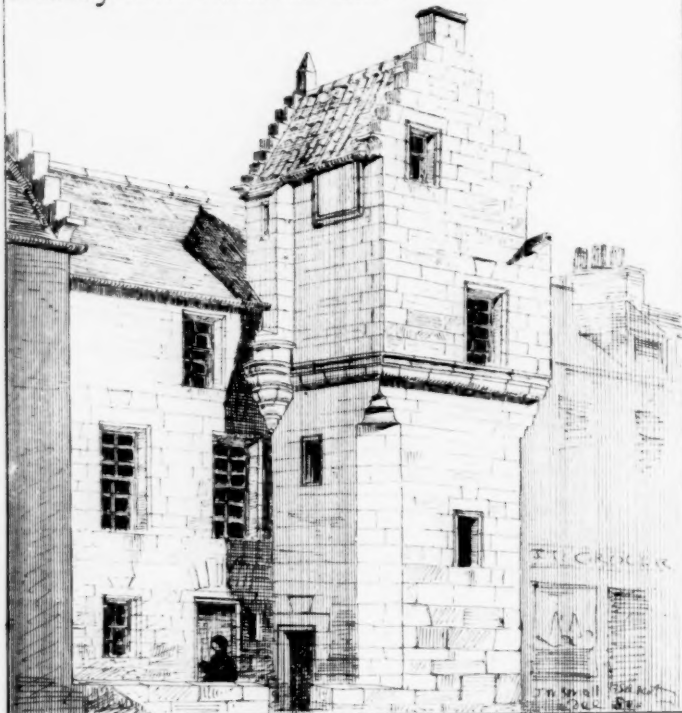
A dining-room ought not to look as if one went into it, as one does into a dentist's parlor, for an operation, and came out of it when the operation was over — the tooth out, or the dinner in. A drawing-room ought to look as if some kind of work could be done in it less toilsome than being bored. A library certainly ought to have books in it, not boots, as in Thackeray's country snob's house, but so ought each and every room in the house, more or less; also, though all rooms should look tidy, and even very tidy, they ought not to look too tidy.

Furthermore, no room of the richest man should look grand enough to make a simple man shrink in it, or luxurious enough to make a thoughtful man feel ashamed in it; it will not do so if art be at home there, for she has no foes so deadly as insolence and waste. Indeed, I fear that at present the decoration of rich men's houses is mostly wrought out at the bidding of grandeur and luxury, and that art has been mostly cowed or shamed out of them; nor when I come to think of it will I lament it overmuch. Art was not born in the palace; rather she fell sick there, and it will take more bracing air than that of rich men's houses to heal her again. If she is ever to be strong enough to help mankind once more, she must gather strength in simple places — the refuge from wind and weather to which the goodman comes home from field or hillside; the well-tided space into which the craftsman draws from the litter of loom, and smithy, and bench; the scholar's island in the sea of books; the artist's clearing in the canvas-grove; — it is from these places that art must come if she is ever again to be enthroned in that other kind of building, which I think, under some name or other, whether you call it church or hall of reason, or what not, will always be needed — the building in which people meet to forget their own transient personal and family troubles in aspirations for their fellows and the days to come, and which to a certain extent make up to town dwellers for their loss of field, and river, and mountain.

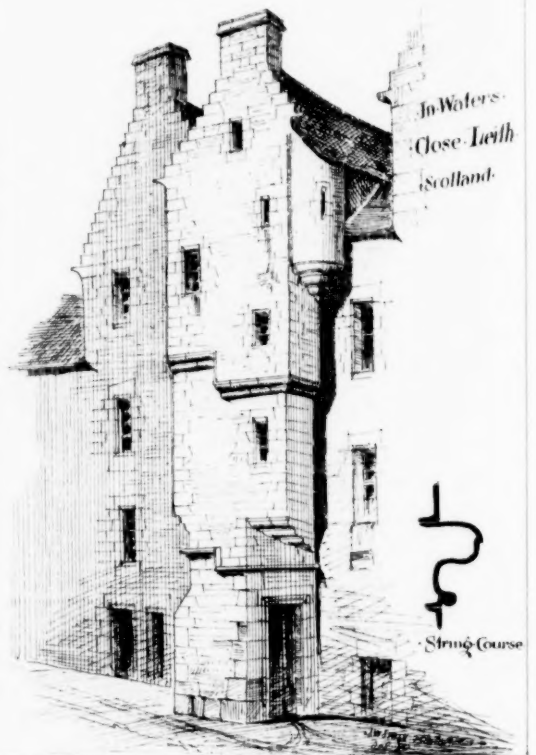
Well, it seems to me that these two kinds of buildings are all we have really to think of, together with whatsoever outhouses, workshops and the like may be necessary. Surely the rest may quietly



In the High Street - Pittenweem - Fifeshire - Scotland



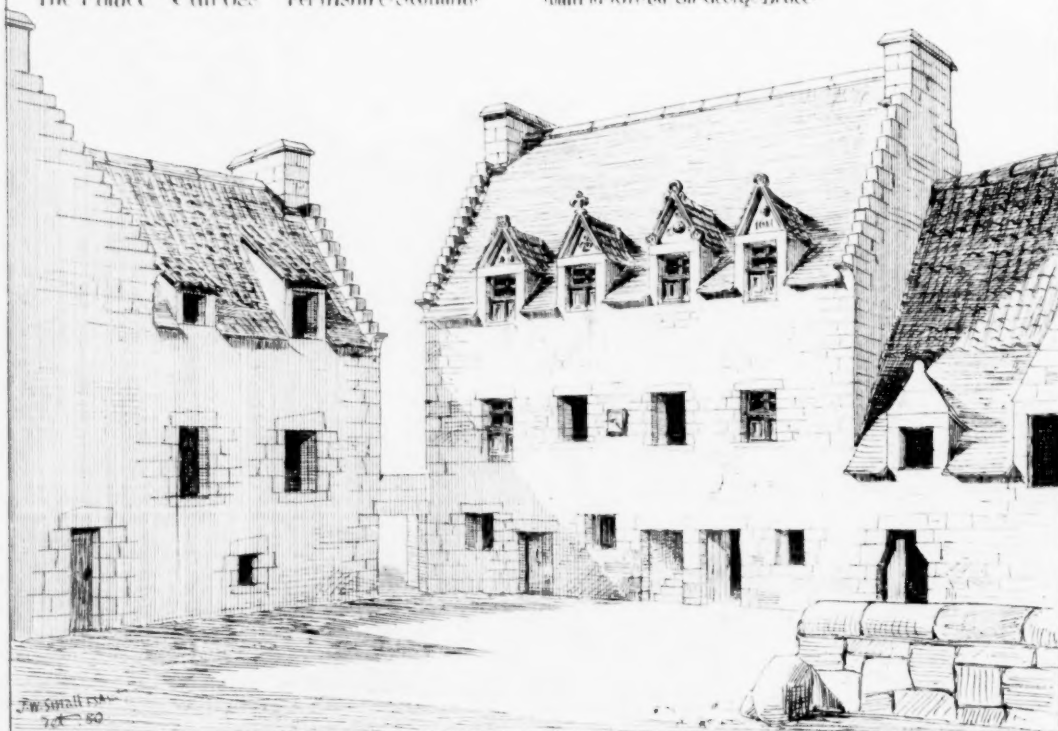
In Waters - Close - Perth - Scotland



String Course

"The Palace" - Culross - Perthshire - Scotland

built in 1611 by Sir George Bruce



detail of
copes to the
Shutter-boards

Section of molding
of pediments

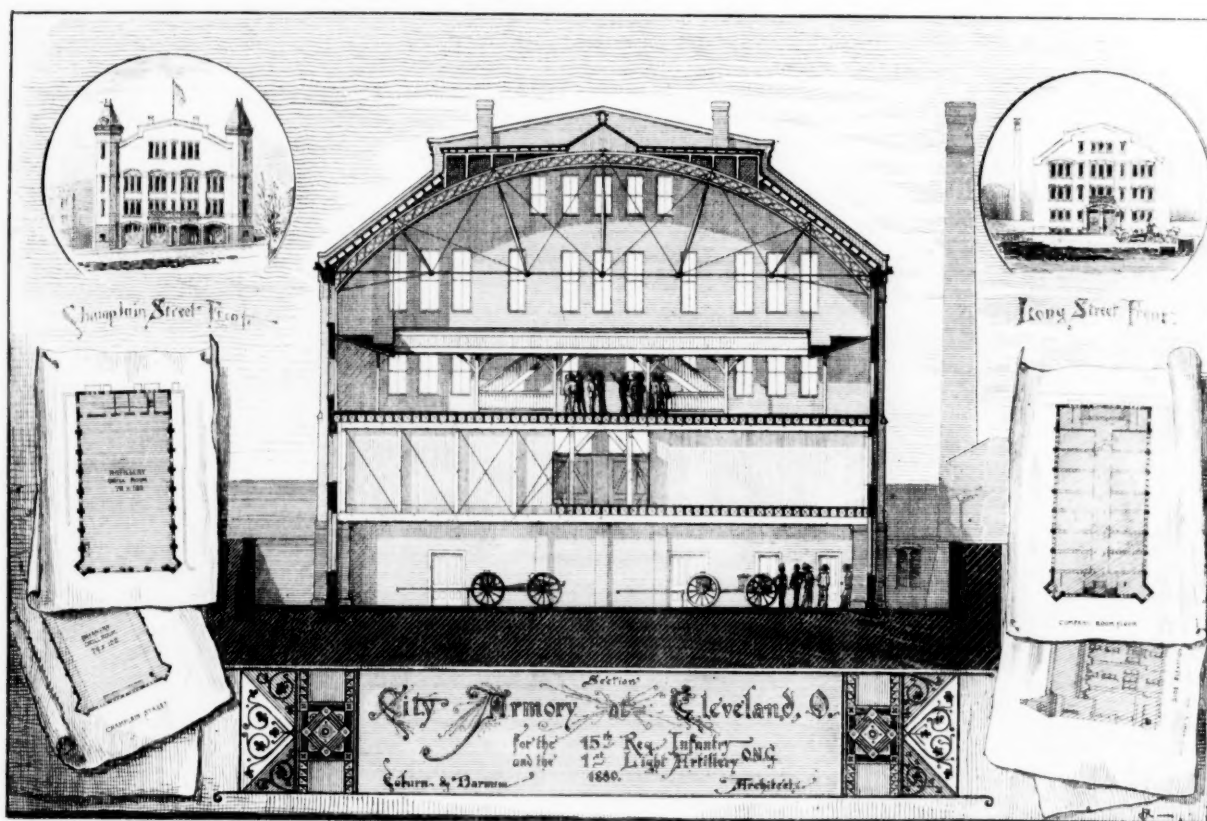
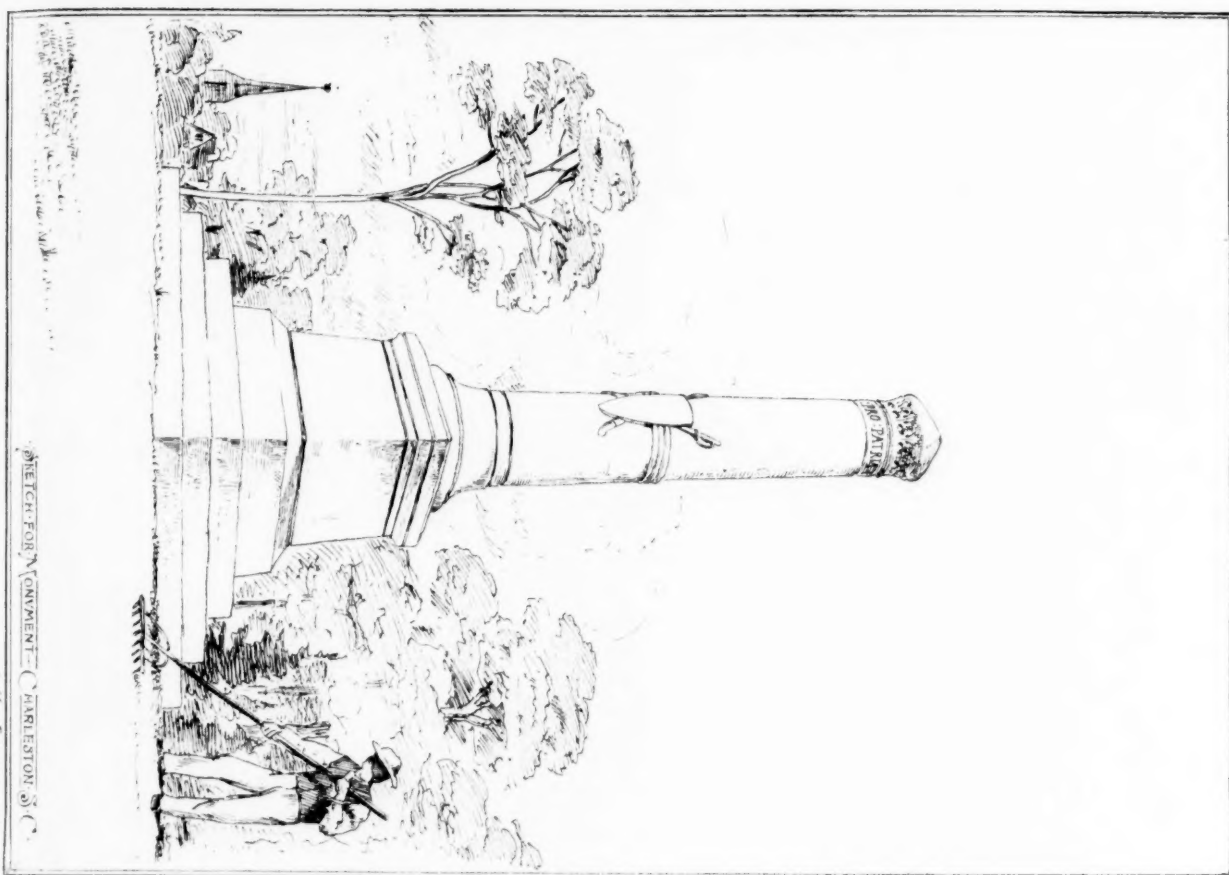
detail of
iron han-
dle and
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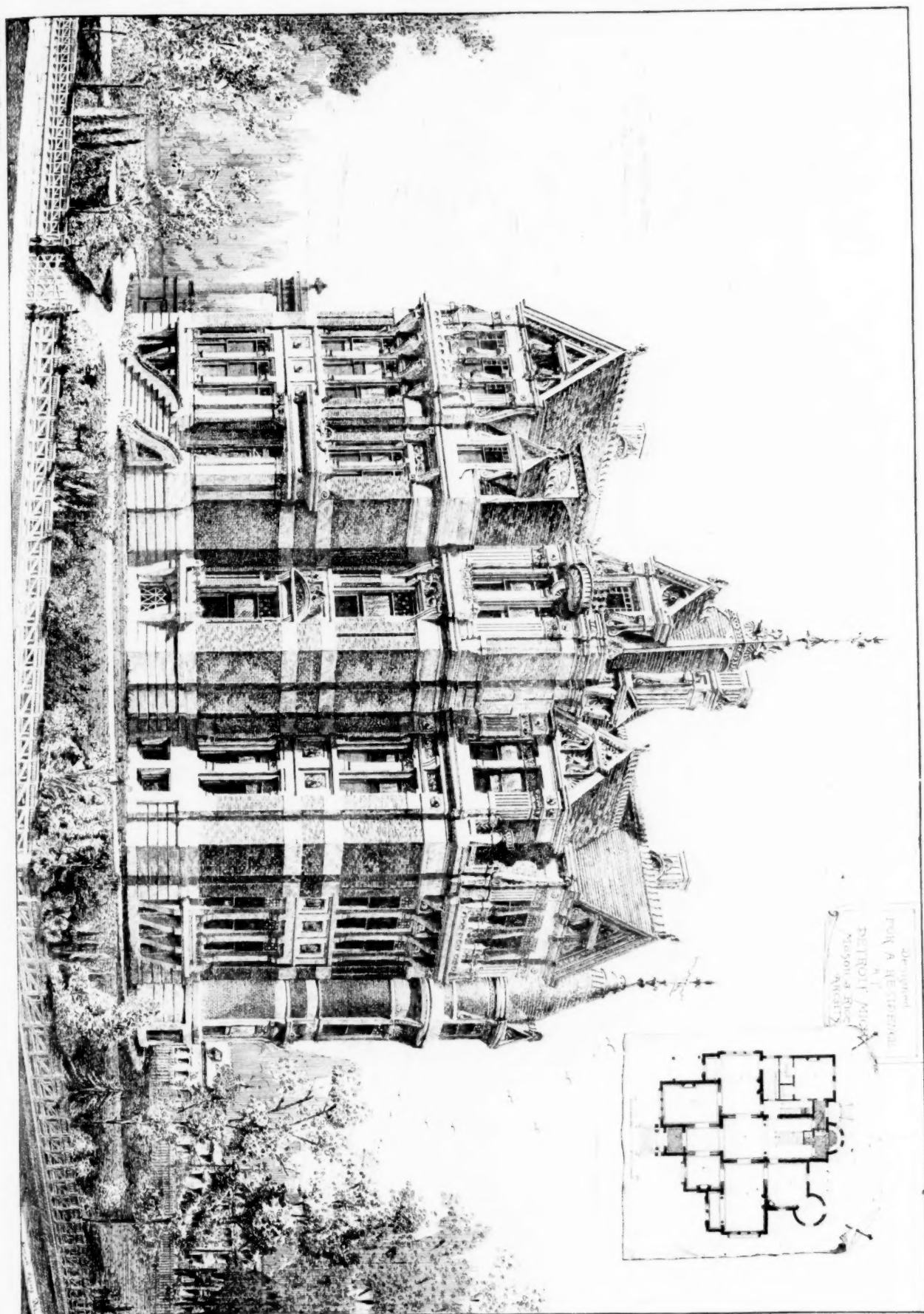
from interior

J. W. Small 1880
2. 1880

The Building Process of all the most famous

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drop to pieces for aught we care; unless it should be thought good in the interest of history to keep one standing in each big town, to show posterity what strange, ugly, uncomfortable houses rich men dwelt in.

Meantime, now, when rich men won't have art, and poor men can't, there is, nevertheless, some unthinking craving for it, some restless feeling in men's minds of something lacking somewhere, which has made many benevolent people seek for the possibility of cheap art.

What do they mean by that? One art for the rich and another for the poor? No, it won't do. Art is not so accommodating as the justice or religion of society, and she won't have it.

What then? There has been cheap art at some times certainly, at the expense of the starvation of the craftsmen. But people can't mean that; and if they did, would happily no longer have the same chance of getting it that they once had. Still they think art can be got round some way or other — jockeyed, so to say. I rather think, in this fashion, that a highly gifted and carefully educated man shall, like Mr. Pecksniff, squint at a sheet of paper, and that the results of that squint shall set a vast number of well-fed, contented operatives (they are ashamed to call them workmen) turning crank-handles for ten hours a day, bidding them keep what gifts and education they may have been born with for their — I was going to say leisure hours, but I don't know how to, for if I were to work ten hours a day at work I despised and hated, I should spend my leisure, I hope, in political agitation, but I fear — in drinking. So let us say that the aforesaid operatives will have to keep their inborn gifts and education for their dreams. Well, from this system is to come threefold blessings: food and clothing, poorish lodging and a little leisure to the operatives, enormous riches to the capitalists that rent them, together with moderate riches to the squinter on the paper, and lastly, very decidedly lastly, abundance of cheap art for the operatives or crank-turners to buy — in their dreams.

Well, there have been many other benevolent and economical schemes for keeping your cake after you have eaten it, for skinning a flint, and boiling a flea down for its tallow and glue, and this one of cheap art may just go its ways with the others.

Yet to my mind real art is cheap, even at the price that must be paid for it. That price is, in short, the providing of a handicraftsman who shall put his own individual intelligence and enthusiasm into the goods he fashions. So far from his labor being "divided," which is the technical phrase for his always doing one minute piece of work, and never being allowed to think of any other; so far from that, he must know all about the ware he is making and its relation to similar wares; he must have a natural aptitude for his work, so strong that no education can force him away from his special bent. He must be allowed to think of what he is doing, and to vary his work as the circumstances of it vary and his own moods. He must be forever striving to make the place he is at work at better than the last. He must refuse, at anybody's bidding, to turn out, I won't say a bad but even an indifferent piece of work, whatever the public want, or think they want. He must have a voice, and a voice worth listening to in the whole affair.

Such a man I should call not an operative, but a workman. You may call him an artist if you will, for I have been describing the qualities of artists, as I know them; but a capitalist will be apt to call him a troublesome fellow, a radical of radicals, and in fact he will be troublesome, mere grit and friction in the wheels of the money-grinding machine.

Yes, such a man will stop the machine perhaps; but it is only through him that you can have art, *i. e.*, civilization unmaimed, if you really want it; so consider, if you do want it, and will pay the price, and give the workman his due.

What is his due? that is, what can he take from you, and be the man that you want? Money enough to keep him from fear of want or degradation for him and his; leisure enough from bread-earning work (even though it be pleasant to him) to give him time to read and think, and connect his own life with the life of the great world; work enough of the kind aforesaid, and praise of it, and encouragement enough to make him feel good friends with his fellows; and lastly (not least, for 'tis verily part of the bargain), his own due share of art, the chief part of which will be a dwelling that does not lack the beauty which Nature would freely allow it, if our own perversity did not turn Nature out of doors.

That is the bargain to be struck, such work and such wages; and I believe that if the world wants the work and is willing to pay the wages, the workmen will not long be wanting.

If it be certain that the world — that is, modern civilized society — will never more ask for such workmen, then I am as sure as that I stand here breathing, that art is dying; that the spark still smouldering is not to be quickened into life, but dampened into death. And indeed often, in my fear of that, I think would that I could see what is to take the place of art! For, whether modern civilized society can make that bargain aforesaid, who shall say? I know well — who could fail to know it? — that the difficulties are great. Too apt has the world ever been "for the sake of life to cast away the reasons for living," and perhaps is more and more apt to it as the conditions of life get more intricate, as the race to avoid ruin, that seems always imminent and overwhelming, gets swifter and more terrible. Yet how would it be if we were to lay aside fear and turn in the face of all that and stand by our claim to have, one and all of us, reasons for living? Mayhap the heavens would not fall on us if we did.

Anyhow, let us make up our minds which we want — art, or the absence of art — and be prepared, if we want art, to give up many things, and in many ways to change the conditions of life. Perhaps there are those here who will understand me when I say that that necessary change may make life poorer for the rich, rougher for the refined, and, it may be, duller for the gifted, for a while; that it may even take such forms that not the best or wisest of us shall always be able to know it for a friend, but may at times fight against it as a foe. Yet, when the day comes that gives us visible token of art rising like the sun from below — when it is no longer a justly despised whim of the rich, or a lazy habit of the so-called educated, but a thing that labor begins to crave as a necessity, even as labor is a necessity for all men — in that day how shall all trouble be forgotten, all folly forgiven — even our own?

Little by little it must come, I know. Patience and prudence must not be lacking to us, but courage still less. Let us be a Gideon's band. "Whosoever is fearful and afraid, let him return, and depart early from Mount Gilead." And among that band let there be no delusions; let the last encouraging lie have been told, the last after-dinner humbug spoken, for surely if the days seem dark we may remember that men longed for freedom while yet they were slaves; that it was in times when swords were reddened every day that men began to think of peace and order, and to strive to win them.

We who think, and can enjoy the feast that Nature has spread for us, is it not both our right and our duty to rebel against that slavery of the waste of life's joys, which people thoughtless and joyless, by no fault of their own, have wrapped the world in? From our own selves we can tell that there is hope of victory in our rebellion, since we have art enough in our lives, not to content us, but to make us long for more, and that longing drives us into trying to spread art and the longing for art; and as it is with us so it will be with those that we win over: little by little, we may well hope, will do its work, till at last a great many men will have enough of art to see how little they have, and how much they might better their lives if every man had his due share of art — that is, just so much as he could use if a fair chance were given him.

Is that, indeed, too extravagant a hope? Have you not heard how it has gone with many a cause before now? First, few men heed it; next, most men condemn it; lastly, all men accept it — and the cause is won.

THE ILLUSTRATIONS.

CITY ARMORY, CLEVELAND, OHIO. — MESSRS. JOBURN & BARNUM, ARCHITECTS, CLEVELAND, O.

This building stands in the central part of the city, facing upon Champlain and Long Streets, and adjoining the central police station. The artillery drill-room, entered from Champlain Street, occupies the first story; the infantry drill-room, entered from Long Street, is situated upon the third floor. To keep the lower floor clear, the trusses supporting the upper floors span the entire width of the building, or about seventy-five feet. The height occupied by the trusses forms the second story, and accommodates the various company rooms. These are approached by a corridor extending through the middle of the building and through the middle panel of the trusses. The building is of brick and stone, with heavy stone piers beneath the trusses. The floor trusses are of wood and iron, built upon the Pratt system, and of peculiar design to accommodate the passage through them and the strain of tramping men. The roof-trusses, bow-string, are of wood and iron.

SCOTTISH SKETCHES: — "IN THE HIGH STREET," PETTENWEEN; "IN WATERS CLOSE," LEITH; "THE PALACE," CULROSS. — BY J. W. SMALL, F. S. A., SCOT.

The palace at Culross derives its name from the fact that James VI was here entertained during a visit he was paying to his native land.

DESIGN FOR A HOUSE AT DETROIT, MICH. — MESSRS. MASON & RICE, ARCHITECTS, DETROIT, MICH.

DINING-ROOM AT COOMBE-WARREN. — MR. GEORGE DEVEY, ARCHITECT, LONDON, ENGLAND.

DESIGN FOR A MONUMENT AT CHARLESTON, S. C., BY MR. WM. MARTIN AIKEN.

THE PERCENTAGE SYSTEM.

ONE of the reforms necessary to place architectural practice on a more equitable footing is the alteration or modification of the existing mode of paying architects by percentage. The custom of payment by commission on outlay is one of modern origin. Even so late as the 17th century we hear of architects being paid by salary, and Sir C. Wren received a yearly salary for his work; also it is pretty certain that the custom of remunerating by a percentage on outlay arose when the architects' duties became limited to strictly professional labor, and were separated from those of the builders. The contracting system led to the separation, and there is no doubt that the percentage payment was introduced as a convenient mode of assessing the architect's labor. It has been contended by some that the payment upon outlay is fair towards the employer, for they argue that the value of professional services increases in proportion as the magnitude of the work increases, that a costly building should receive the best treatment, and that the outlay incurred by an individual is a fair criterion of what he can afford to pay for profes-

sional skill. It may be worth while to inquire into the reasonableness of these claims. If it be said that the larger the outlay the greater the responsibility, we can understand the reason why the system was introduced, but as the outlay can be increased to any extent by the architect without materially adding to the magnitude or efficiency of the building, a very different conclusion may be arrived at. Again, magnitude does not usually increase the difficulties of the architect; it quite as often reduces the amount of mental labor—take, for instance, a house to cost £5,000, and a work-house or mill to cost ten times that amount. It is equally plain that cost may be incurred without a proportionate amount of skill being exercised by the outlay-paid architect, and to say that cost is a criterion of what the employer can afford to pay for professional services, is a statement scarcely warranted by facts. The arguments that may be urged on the other side appear even more conclusive, and tend to show that both the employer as well as the skilful architect are sufferers, and the only thing that can be said for the system is, that it is an easily understood and calculable scale for the public. At present the architect is not paid for his skill, but upon the cost to which he puts his employer, for, unfortunately, the expenditure in building bears no just relation to the amount of thought and labor bestowed. The effect of this system is to reduce all architects' labor to one dead level, and to create an easy means of increasing the cost of a building. Whatever adds to cost adds to the remuneration of the architect. It is hardly necessary to remind the reader that additional expense does not always mean increased efficiency; on the contrary, it bears often an indirect ratio to the skill exercised in the building. It is needless for us to illustrate this proposition by an appeal to every-day facts. When an employer engages an architect to prepare designs for a house, he does so presuming that the usual commission of five per centum secures the services of a certain amount of skill and experience; he also presumes, like most employers of professional labor, that for increased outlay he will get a better as well as a larger house. Both these presumptions are to a certain extent ill-grounded. As regards professional skill, at present, he has no guaranty that he is employing either an experienced or an able architect; on the other hand, he may have placed his wishes in the hands of a young, perhaps deserving and clever young man, who has never had a commission before, and who, however anxious to serve his client, may fail from no fault of his own to give the satisfaction looked for. Again, as regards cost, the employer has no guaranty that the expenditure of an additional £100 or £500 will be well spent, or command greater convenience, or even more of the appointments necessary to make a good or desirable residence. The money may go in increasing the size of the rooms, or in adding more costly decorations; but of actual skill exercised in carrying either of these into effect, he has no certainty whatever. But the mischief of the percentage system does not stop here. There are some members of the profession who enter it from a purely commercial aspect; they look upon the architect's employment as a very lucrative business, simply because the architect can, if he choose, "play into his own hands," and to a certain degree make his own remuneration. With men of this low *morale*, the readiest means of increasing expenditure too frequently suggest themselves—enlargement and ornamentation.

Competition in itself has mainly arisen out of the present mode of remuneration; it was clearly promoted to obtain the best result from a number of individuals who, if they had been separately employed, would have had no inducement to exhibit skill, and it may with equal fairness be said that all that is objectionable in that system of obtaining talent proceeds from the desire on the part of the public to obtain the most showy design, and on the part of the competitor to obtain the largest remuneration by percentage.

If we look on the other side to unrecognized talent, the mode of paying is extremely unfair; one architect may spend hours of thought and study in elaborating his design, while another may save himself all trouble by taking his ideas from some book, or making his building the mere *replica* of another: yet the remuneration is the same in either case, except that the latter has stolen a march on his brother in regard to time, and may turn out two designs to the former's one. The copyist does not quarrel with the present mode of payment, in fact, he finds it remunerative, for it pays in a fair proportion to the extent of copying effected; it is a good remuneration for quantity, but not for quality; but the artist who devotes time and thought has the undoubted grievance to urge that the more time and pains he devotes, the less he is paid. We see, then, that the present system is amply remunerative to the incompetent, but very disproportionately so to the competent architect, the unfortunate result being that both are placed on the same level, and that incapacity and inexperience are paid at the same rate as ability, making mediocrity and quantity the most remunerative elements in building.

There is even a greater injustice inflicted by the percentage remuneration, namely, that the few successful men get all the work, or a greater share of it, than they can carry out with advantage. Most of the work of the day falls into the hands of a few, and this will be always the case so long as the five per cent rate is the uniform charge. When people find out that they can obtain the services of leading architects at the same rate as those of a comparatively unknown practitioner, we cannot blame them for using their discretion, though often they have not the discernment to see that by overburdening men of repute with small commissions, they are really obtaining the thought and services of those in their employ, and not

of the men themselves, while they are denying to men of attainment in the profession all chances of success, who are thereby driven into competitions. We can appeal to the younger members of the profession for evidence of the injustice done by this proceeding, and to the remarks recently made at the Architectural Association by certain members, condemning the present practice of architects seeking and taking more work than they can properly supervise or carry out. At the same time architects, however greedy they may be, are not entirely to blame; like other men they are tempted to take as much as they can get, unmindful of the debt they owe to art. It is the system of remuneration which has led to the results, for, if our ablest architects could charge in the same way as eminent lawyers or physicians, there would be a more equal distribution of work, and the lesser or younger men would have a better chance of winning their way to the front ranks by legitimate means.

We have seen, then, that there is a temptation to the architect to increase, not to limit expenditure; that the demands made upon the architect's skill and labor are generally in an inverse proportion to the outlay or size of the building, and that, therefore, it is not fair to pay him a uniform percentage in every case; that repetitions of the same design, as in the case of a terrace of houses of similar plan and elevation, ought not to bear the same charge as a design for one house, a church, or a complicated municipal structure, where the skill and time expended would be fourfold, and, lastly, that a percentage of uniform rate has a tendency to reduce architectural skill to one level, and to overburden successful men with an amount of work they cannot possibly do justice to.

The painter and sculptor both win their spurs by making their remuneration correspond to their skill and to the demand made upon it, and we can scarcely imagine either being paid for his work by the amount of canvas covered or of stone sculptured. Imagine a uniform rate of charge: where would painting and sculpture be? But the painter or sculptor cannot so well delegate his work to others. The architects only, among the hierarchy of artists, are content to depute others to carry out work for them, and for the only reason that they find that they do not reap any additional emolument for personal skill. The time has gone by when one great work was enough to satisfy the ambition of the architect; we do not live in the age of the Medici, when an artist was paid proportionately for the talent he had exercised, but it is not unreasonable that he should ask for the same recognition in this respect, as the public awards to the painter, the lawyer, and the physician.

We will not now attempt to say in what precise manner reform ought to be made, as the opinion of the profession out of doors ought to be obtained before anything is proposed; but it is evident that a graduated scale ought to be adopted, based primarily on the degree of complexity of buildings, or the skill necessary in their design and elaboration. Such a scale might be made to vary from ten per cent to two and a half per cent, small and difficult works being at one end of the scale, and extensive structures of the factory class at the other. It is true in the schedule of rules published by the Institute, an ascending scale is spoken of: Clause 4 states, "In works of small value, say, £500 in amount, five per cent is not remunerative, and the charge should be by time or by an ascending scale reaching ten per cent for works under £100;" but this clause is practically inoperative in the absence of a specific rate. Repetitions and works of a decorative character are proposed to be charged for by special circumstances, but this also is a vague manner of putting it, and no settled rule is likely to be established from such a clause.

It seems further desirable that degrees of skill and experience should be recognized; that every practitioner, within reasonable limits, should be enabled to set his own value on his labor, but this is a question to be determined only by the united action of the profession. Custom and legal sanction have given the present system a footing, but the previous endeavor to promote uniformity of charges was only tentative, while it will be universally acknowledged that neither justice nor common-sense have sanctioned a mode of payment which places outlay before skill, and which clearly contradicts not only honest free trade, but the very foundation of art.—*Building News*.

FIXTURES.

AN important case on the law relating to fixtures was tried at the Brompton County Court recently, and judgment was delivered by Mr. John Scott, Deputy Judge, on Wednesday, November 24. The plaintiff was Mr. Lawrence, and the defendants were Pearce and Morris. The action was brought by the plaintiff, a brewer, against the defendant, the tenant of a beer-shop, situate No. 6, Market Place, Uxbridge Road, for the detention of a beer-engine and three beer-stands. Upon the application of Pearce, the judge ordered that Morris, the landlord of the premises, should be brought in as a co-defendant. The material facts were as follows:—Some time in the year 1876 the plaintiff Lawrence lent to one Durandau, who was the tenant of the beer-shop in question, the beer-engine and beer-stands claimed in this action. The beer-engine was so fixed to the counter in the bar that it might be removed without injury to the freehold. The pipes which connected it with the beer-barrels in the cellar being passed through a hole cut in the floor of the bar. Durandau remained in possession of the beer-shop until October, 1878, when he left it. On January 30, 1879, Morris, the landlord, obtained possession of the premises by virtue of a judgment and exe-

cution in an action brought against Durandeu and also against Athaws and Cooper, who claimed under a bill of sale from Durandeu.

Morris afterwards let the beer-house to the defendant Pearce, and sold him the tenant's fixtures (including the beer-engine, which still remained as Durandeu had left it) and other effects for 60%. Before Pearce entered into possession he had notice from the plaintiff that he claimed the beer-engine and beer-stands, and after Pearce went in the plaintiff demanded them from him and from Morris. It was not disputed that the beer-engine had been lent by the plaintiff to Durandeu and was a "removable fixture," but it was contended for Morris that, being a tenant's fixture left by Durandeu upon the premises after the expiration of his tenancy under the circumstances above mentioned, it vested by law in the landlord. Pearce adopted the defence set up on the part of Morris.

It was submitted for the plaintiff, that although a landlord may by the abandonment of fixtures by the tenant acquire a right to them as against him, no act or default of the tenant could deprive the true owner of his property in a chattel lent by him to the tenant; that, whether the tenant has at the expiration of his tenancy abandoned the fixtures or not is a question of intention, and that here as the plaintiff, the true owner of the goods, never showed any intention to relinquish his property in them, no act of the tenant could divest his right to reclaim them.

No distinction was made in the arguments between the beer-engine and the beer-stands, nor was there any evidence to show in what manner the latter were fixed. It was assumed, therefore, that they were also tenant's fixtures.

Having stated the facts, the learned deputy judge delivered judgment as follows:—Upon principle, I am of opinion that where a man lends another an article like a beer-engine, knowing that it will be so placed on the premises occupied by the bailee, that it will become a tenant's fixture, and so may, if left upon the premises at the determination of the tenancy vest in the landlord, he can acquire no better right to remove it than the bailee himself had, viz., a right to remove it during the tenancy, or immediately upon its determination.

With regard to the point as to intention, whatever be its value, that can only apply as between the landlord and the tenant. The intention of a stranger is wholly immaterial.

For these reasons I give judgment for both defendants, and inasmuch as Morris is substantially the party between whom and the plaintiff the real question arose, I think he was properly brought in to defend. I therefore adjudge the plaintiff to pay the costs of both defendants. — *The Architect*.

ENGINEERING ABROAD.

THE great questions in Paris at present are the supply of water and the disposal of the sewage. The latter question has become so pressing that everybody says something must be done. The *odeurs de Paris* were so offensive during the whole summer that persons became sick from them, while all the zymotic diseases increased. The engineers of Paris have devoted several sittings to the consideration of the subject, and the whole question has been treated so exhaustively that a condensed translation of the papers read cannot fail to be interesting. It is now generally admitted that nothing can give us a satisfactory solution of the difficulty except the thorough drenching, as it were, of every house. The system which prevails at present in Paris and other cities is the water-tight closet; there is also in use the movable closet, which, though offering some advantages, is still too costly. But here very little improvement has been made. The old-style pump is still in vogue, although the Keiser pump is being rapidly adopted. The difficulty of destroying the mephitic gases still remains, however, for no substance can be mixed thoroughly with the matter of the closets. The system of atmospheric pressure for emptying has been in successful operation in some of the western districts of the city. It has been found that in order to obtain a vacuum of 70 c. of mercury, two and a half times the volume of the receiver must be withdrawn by the pumps. The system adopted in Holland of having iron pipes leading direct from the closet to an iron vessel under the sidewalk, and admitting of a thorough pumping out, has been found very satisfactory. To dispose of the sewage is, however, a problem of great difficulty. The peninsula of Gennevilliers has been used for some time as a general dumping-ground, but the opposition of the property owners has been very great, and, it must be admitted, justified.

The sewers discharge every twenty-four hours some 262,646 cubic metres of matter. This mass of liquid mud is thrown into the Seine by the two collectors at Asnières and St. Denis. The deposits formed in the river involve dredging, at a cost of 200,000 francs annually. But the bed of the Seine is gradually being filled up, and one-fourth of it is now a mass of mud, a regular focus of fermentation and infection. The experiment at Gennevilliers was begun in 1866, and now some seven hundred acres receive the sewage. But there is a limit to the utilization of sewage for agricultural purposes, and, as the amount of rain varies every season, it is evident that irrigation may sometimes be more of an injury than a benefit, and, in any case, what is practicable for small towns becomes utterly impossible for cities like Paris and London. Let us now see the various methods that have been resorted to for getting rid of the sewage. The Johnson process is said to give satisfaction in London. It consists in mixing the sewage with lime, and then collecting the product in filter presses; but a trial of lime did not prove a success in Paris.

The Gautier and Gueroult process applies a hydraulic pump to the matter, which is previously treated by a precipitant, and then decanted. The Cavalier process is yet in an experimental condition, but the inventor used a re-agent, which he keeps secret. The Hennebue & Vaureal system consists of two operations: first, the separation of the solid from the liquid matter, by adding two to three millieims of sulphate of zinc, and then from five to twenty millieims of lime. The matter is decanted after a few hours, and the solid parts passed through Farinaux filtering presses; secondly, distillation of the liquid part, which is added to the filtered matter, and sent to special apparatus for the manufacture of the sulphate of ammonia. The Coquerel process uses phosphate acid of alumina in mixture with the sewage, and then heats to 75 degrees C.; it is then passed through an ordinary Farinaux filtering press. The liquids require, however, an enormous quantity of lime to disengage the ammonia. Some experiments are making at Bondy with this method, but it is more suitable for insoluble matters. Collet's system is based on the use of a re-agent, which looks like black powder, and which is probably the sulphate of the peroxide of iron, in a dose of from 275 to 280 kilos. Gas is disengaged extensively, and after being allowed to remain four or five hours, the liquid is drawn off, and the solid matters put in large cylinders, and from 200 to 250 kilos of phosphate and sulphate of lime added. A shaft with pallets works up the mass, while a current of hot air traverses the cylinder. Complete desiccation is obtained after seven or eight hours. The Firmann and other methods are almost similar, and have given similar results.

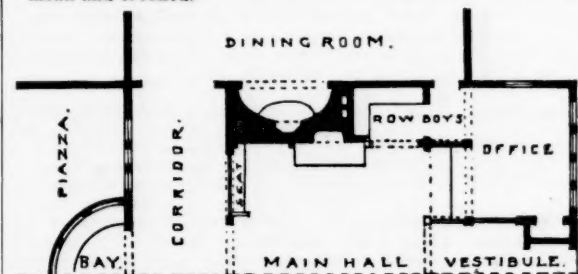
That the system of fixed closets, without connection with the sewers, has some supporters, even among medical men, is well known, the position taken being that the transformation of local matter in the closets destroys all organisms, and that the urea is changed into carbonate of ammonia, with a little sulfo-hydrate. The connection of the closets with the sewers, and consequently with the air, is looked on with some apprehension. But there really seems to be no system which can offer the same advantage as the sewer, were it not that the Seine will be rendered unbearable.

The use of lime water and the clarification of the sewage before being sent to the Seine would offer another solution. — *Engineering News*.

"WAYSIDE'S" HOTEL ENTRANCE-HALL.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen, — We notice that in the report of the jury of award in the hall competition, reference was made to the entrance from the main hall to dining-room in the design marked "Wayside" as being "mean and crooked."



In explanation of our intentions we enclose a sketch showing the relation of dining-room to a corridor at the rear of the main entrance-hall from which the principal rooms of the first floor open.

The corridor was indicated on the detail sheet by lettering, which was doubtless overlooked by the jury.

T. J. G. and F. W. A., Authors of design "Wayside."

FLITCH-PLATE GIRDERS.

ST. LOUIS, Dec. 31, 1880.

TO THE EDITOR OF THE AMERICAN ARCHITECT:—

Sir, — If you will kindly publish a serviceable formula for calculating strains in flitch-plate girders, I think you will confer a favor on many readers. I find nothing of the kind in the reference books usually resorted to by architects and engineers.

A formula is wanted for strains within the limit of elasticity of the material, and another for determining the deflection of a flitch-plate girder under a given load. Where plastered ceilings depend from the girder, the deflection becomes the important question, since such a girder might bend enough to crack plaster without exceeding the limits of elasticity.

There is also a question as to the most approved practice in proportioning the girder to its load. Should the flitch-plate be strong enough to sustain the whole load without aid from the timbers, save to keep it from bending laterally, or is it prudent to use a lighter flitch-plate and depend on the timbers to carry a portion of the load directly? Very respectfully,

C. E. ILLSLEY.

[Flitch girders seem to be used with a very vague notion of their real strength. Hurst's Architectural Surveyors' Hand-book gives a formula for the ultimate strength of such a girder, as follows:— b being the breadth of the girder; d , the depth; t , thickness of iron flitch; L , length of bearing in feet; W , breaking weight at centre in hundred weights,

$$W = \frac{d^3}{L} (Cb + 30t).$$

The remark is made that the thickness of the iron flitch should be about one-twelfth that of the wood for fir and pine, and about one-tenth for oak,

while another authority gives one-eighth as the proper proportion. This formula seems to us to give rather excessive results, as a 12" x 12" pine girder with one-inch fitch-plate would by it possess a strength nearly equal to the sum of the resistances of the wood and the iron separately, and we should use it with a liberal margin of safety.

No formula for deflection in such a girder exists, to our knowledge, nor do we know that any experiments have been tried. Perhaps some of our readers have made actual tests of deflection in such beams. If so, they could easily be compared with the calculated deflections of the wood and the iron separately, and some approach to an empirical rule be obtained. We should be very glad to have the question discussed. — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

MR. WYLLYS H. WARNER. — Most of our readers have seen in the daily papers notices of the death of Mr. Wyllys H. Warner of New York, a gentleman whose ability and attainments in his chosen field of labor entitle him to more than a passing mention in this journal. Among those who have carried the science of heating by steam to the high position in which it now stands in this country, Mr. Warner's name stands perhaps almost the highest, not only as a scientific man, but in all the relations of business, his intelligence and fertility of resource made him prominent. Perhaps if he had been less a business man, science would have been the gainer by his undivided devotion; but again, if he had given himself wholly to science, the every-day world would have lacked the benefit of the practical skill by which he brought his science to the satisfying of its needs, and if he lost anything in fame, his friends may at least claim that he gained more in usefulness. Thanks to him, and to others like him, what was once a trade or an experiment, has become an important pursuit, we might almost say a profession, whose high rank among useful callings we are only just beginning to recognize.

ENFORCING THE BUILDING LAW IN BROOKLYN. — In view of the recent tenement-house calamity in New York, says the *Fireman's Journal*, Building Commissioner Thomas, of Brooklyn, has sent to the Law Department for prosecution the cases of about 150 owners of property who have failed to comply with the law providing for fire-escapes. Some of the parties to be prosecuted have been notified as far back as two years ago. The penalty for non-compliance with the law is a fine of \$500.

THE CATHOLIC CATHEDRAL AT MONTREAL. — A telegraphic despatch states that St. Peter's Cathedral Church, which has been in process of erection in Dominion Square, Montreal, nearly ten years, and would have been the largest church edifice, when finished according to design, on this continent, is doomed to destruction. When almost ready for the roof, and after hundreds of thousands of dollars have been expended, as well as many lives of workmen lost in its erection, it is found that the undertaking is too great, and it has been determined by the Catholic church authorities to have the building razed to the ground, and a church of moderate dimensions built in the east end of the city, where the Catholic population resides. The resolution has caused universal regret, as the great edifice was already beginning to be considered one of the creations of architectural genius.

THE NEW YORK BUILDING DEPARTMENT EMPLOYEES. — During July and August last year, the employees in the Department of Buildings were not paid their salaries, as the department was supposed to have been abolished in June, 1880. Mayor Cooper notified the men that after June 8, when the act transferring the department to the control of the fire commissioners took effect, he would not pay their salaries, and that if they remained, pending the settlement of the litigation in the matter, it would be at their own risks. They took the risks and remained, and at the end of the litigation, payment of their salaries being refused, the inspectors and others who rendered services to the city, brought suits, some eighty in number, through their counsel, Mr. Roswell D. Hatch, against the mayor to recover the amount of their monthly salaries. Instead of a trial of the suits, however, a settlement was arrived at that the amount due each of the parties should be paid on condition that costs, amounting to \$2,200, in favor of their counsel should not be demanded. This being agreed to by Mr. Hatch, the pay rolls were approved, and the amount, some \$14,000, has been paid to Mr. Hatch to be distributed among the different suitors.

THE GREAT BELL OF ST. PAUL'S. — It would seem to be necessary to inform the Dean and Chapter that St. Paul's has always possessed and still owns a great bell. From time immemorial the citizens claimed the eastern part of the churchyard as the place of assembly for their folk-motes. "In the great steeple there situate (which, we may remark, was an isolated structure) was their common bell, which being there rung, all the inhabitants might then hear and come together." Thus, Stow. Dugdale supposes this building to have stood where is now St. Paul's school. So far back as the 15th of Edward I (1286) mention is made in a *quo warranto* of the custom of ringing a bell in this tower as one existing long ere that date. Henry VIII lost tower, spire and bell, at a game of hazard, to Sir Miles Partridge, who quickly overthrew his winnings and melted the bell. For not far short of two centuries St. Paul's had no great bell. That which it now possesses was the gift of William III. It was originally cast in the reign of Edward I, and was hung at the gate of Westminster Hall to notify the hour to the judges. It was afterwards called "Edward of Westminster," and subsequently "Westminster Tom." William gave it to the Cathedral of St. Paul, whither it was brought on New Year's day, 1699. Since then it has been twice recast, each time with an addition of metal. It weighs more than two hundredweight over five tons. It is ten feet in diameter and ten inches in thickness of metal. The tone is very fine in the musical note A, concert pitch. The hour is struck by a large hammer that falls on the outside brim of the bell by its own weight. The bell is only tolled — that is to say, the clapper is only used — on the death of one of the royal family, or of the Archbishop of Canterbury, the Bishop of London, the Dean of St. Paul's, or the Lord Mayor. — *London City Press*.

CAST-IRON. — The experiment made at Woolwich upon specimens of cast-iron show that the higher qualities have an ultimate tenacity ranging from 10,866 lb., or 4.85 tons, to 31,480 lb. or 14 tons, the average being 21,183 lb. or 9.45 tons per square inch. In a large number of specimens submitted for competition the range of tenacity is still more startling, varying from 9,417 to 34,279 lb. per square inch. From these figures it appears absurd to calculate so closely when dealing with iron; for general calculation 5 tons may be regarded as about the lowest limit, but for structural purposes it may be taken as 7 1/2 tons in tension, the working strain being calculated at about one-fifth. Another source gives the following as a low average of the ultimate strength of ordinary varieties found in the market: —

Tension.....	6 tons per square inch.
Compression.....	38 " "
Transverse.....	13 1/2 " "
Shearing.....	8 1/2 " "

The iron close to the surface of a casting is found to be harder and stronger than that within; and, of course, in small bars this hard skin is greater in proportion to the section than in large castings. It is found that the interior is more spongy in large than in small castings, and Mr. E. Hodgkinson's experiments show a difference of more than 20 per cent in the relative tensile strength of bars 1 inch and 3 inches square. It is well known also that repeated remeltings increase the strength of cast-iron. The effect of temperature upon it is of more practical value. Sir W. Fairbairn found that cast-iron of average quality loses strength when heated beyond a mean temperature of 120 degrees, and it becomes insecure at the freezing-point, or under 32 degrees. These data are important to the designer of iron-work, and may lead him to be rather cautious in the employment of cast-iron for structural purposes, other than for columns and details, where tensile strain, jar, and vibration, are not experienced.

TURKISH ARCHITECTURE. — A Constantinople correspondent of the *London Standard* writes as follows of the appearance of the Turkish capital: "The first glance of any visitor, whether he comes from east or west, must be one of admiration — of that I need not speak. But when, more familiar with the magic of the site, a man returning from the true Oriental world begins to look closely, he is struck with the utter absence of those graceful qualities which elsewhere characterize it. The Turk has no feeling for beauty, or color, or elegance. There are several schools of Moslem architecture, all so replete with charm that even in this their day of degradation one may confidently expect that a new mosque will please the eye. None of these exist in Turkey. In describing his recent travels, Baker Pasha speaks with enthusiasm of the Saracenic ruins he found strewn along the march of the Ottoman conquerors. They took no copies nor felt the influence. Arrived at Constantinople, the ponderous deformity of Saint Sophia impressed their kindred souls, and became a model. Their mosques are built as solidly as fortresses upon this most unfortunate prototype. With photographs before him of six grandest mosques in Stamboul, a man acquainted with them all might be obliged to look for unimportant peculiarities to distinguish one from another. They vary in size, of course, and in details; they have more or less minarets, more or less court-yards, and so on; but the general idea is always the same, and it is one supremely ugly. I am not talking of interiors. The exquisite fancy of Oriental architecture nowhere finds room. All is gross, heavy, shapeless — vaults piled over vaults to the low-pitched dome which crowns the informal mass.

LUMINOUS PAINT. — Lieutenant Darwin has just communicated to the Physical Society some most interesting results on the loss of phosphorescence from a surface of Balmain's luminous paint, obtained in a series of experiments at Chatham, the lightness of the phosphorescent surface being estimated by comparison with a sun-burner. A few minutes' exposure to reflected sunlight rendered the paint phosphorescent, and a vessel of ice and water kept it cool. By this method Lieutenant Darwin established the principle that the rapidity of loss is nearly proportional to the square of the intensity of the phosphorescent light. In a report on Balmain's paint as a safety lamp in fiery mines, it was stated that the phosphorescence became brighter after being a short time in the dark, but the law of Lieutenant Darwin as explained to the Physical Society proves this to be an error. The increase of brightness is only apparent, due to the fact that the eye becomes more sensitive to light after exposure to darkness, and this is sufficient to make up for the real loss of brightness in the paint. Owing to their want of heat phosphorescent substances would be peculiarly adapted to light fiery mines if they could be made to yield sufficient light. Dr. Crookes says that in sulphuretted hydrogen and moist air they are apt to lose their phosphorescent property, though they would keep unimpaired for a long time if sealed in vacuum tubes. One specimen is known to be at least eighty years old, and to be still highly phosphorescent. Substances of this kind have been known for a long time. In 1650, there is a reference in Evelyn's *Diary* to a powder which bottled up the sunshine. — *London Telegraph, December*.

FIRES IN EUROPE. — The following table showing the fires which have occurred in some of the leading European cities during the ten years from 1870 to 1879, is copied from the *Wiener Asssecuranz*:

YEAR.	Vienna.	London.	Berlin.	Naples.	Budapest	Hamburg	Breslau.	Munich.	Prague.	Brussels.	Venice.	Leipzig.	Frankfort on Main.
1870.....	356	4,659	777	61	55	341	95	9	118	68	135	40	
1871.....	368	4,401	780	77	97	273	95	11	127	61	136	29	
1872.....	336	3,663	720	58	91	351	93	9	24	95	57	101	40
1873.....	316	3,983	666	69	156	342	143	6	33	95	52	111	19
1874.....	294	4,151	932	91	215	394	147	25	25	114	64	142	61
1875.....	39	3,611	1,047	55	156	597	144	34	30	158	51	194	66
1876.....	40	4,537	1,107	65	129	520	119	20	35	155	42	216	119
1877.....	397	4,021	1,072	61	175	484	111	22	46	191	52	241	91
1878.....	381	4,199	1,204	84	144	519	128	29	34	218	58	259	101
1879.....	382	4,512	1,472	102	121	730	119	34	52	167	75	317	98
Average	36	4,174	997	72	134	465	119	20	35	147	58	185	65

BUILDING INTELLIGENCE.

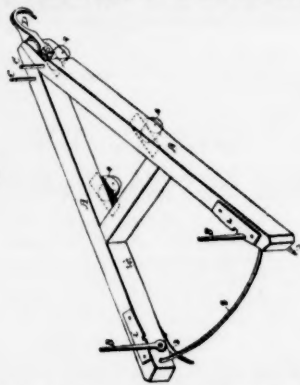
[Reported for The American Architect and Building News.]

[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.]

233,126. SHINGLING-BRACKET.—Samuel S. Calhoun and Hiram L. Miller, Millersburg, O. This is an improved shingle and slate horse for the purpose of carrying or holding shingles or slates while roofing. A A represent the frame of the device, being triangular in form, with cross-piece near the centre to make it firm. Upon this frame the shingles or slates are laid. The standards, B B, prevent them from sliding off of the frame. The standards can be adjusted to suit the pitch of the roof, being pivoted at the lower ends. On top of frame are plates, 2 2, with notches to receive the standards when shifted from one position to another. 3 3 are spurs for the purpose of preventing the bracket from sliding on the roof. 4 4 are casters



which carry the bracket. C C are standards for holding shingles or slates from sliding forward while moving the bracket. The hook, D, is for the purpose of holding it by fastening on the ridge of the roof while the workmen operate on the opposite side. The rod, 5, is for the purpose of raising the rear end when moving it on the roof. The casters are all forward of the centre of the frame. The two rear casters are somewhat larger than the front casters, in order that the frame may rock on the rear casters. Thus, when the rear end is raised by the rod, 5, the weight rests on the three casters, while the spurs are lifted clear off of the roof. When the rear end is dropped the weight presses the spurs into the sheeting of the roof, thus firmly holding it in position.

236,401. DETACHABLE LIP FOR AUGERS.—John R. Adams and Daniel Robertson, Oakland, Cal.

236,409. CURTAIN FIXTURE.—George W. Bennum, Georgetown, Del.

236,422. LATHE FOR TURNING IRREGULAR FORMS.—Rudolf Eickemeyer, Yonkers, N. Y.

236,451. SAW-VISE.—Stephen O. Parker, Meriden, Conn.

236,486. CURTAIN POLE RING.—John Day, Brooklyn, N. Y.

236,487. The Same.

236,496. FILTER.—John Howes, Worcester, Mass.

236,504. POTTERY SHAPE FOR FIRE-PROOF FLOORS.—Michael F. Lyons, Brooklyn, N. Y.

236,505. VENTILATOR FOR FOOT-LIGHTS OF THEATRES.—Marshall H. Mellory, New York, N. Y.

236,506. COMPOUND FILLING FOR FIRE-PROOF STRUCTURES, SUCH AS SAFES, CHESTS, BANK VAULTS AND DOORS.—William H. Maroin, New York, N. Y.

236,507. CHIMNEY, ETC.—Patrick Mihan, Chelsea, Mass.

236,511. SPIKE.—James P. Perkins, Minneapolis, Minn.

236,516. LIME-KILN.—Thomas M. Ullery, Wakefield, Kansas.

236,526. COMBINED ANVIL AND VISE.—Albert L. Adams, Cedar Rapids, Iowa.

236,531. FASTENING FOR MEETING-RAILS OF SASHES.—George Bassett, Chicago, Ill.

236,532. FIRE-PROOF SHUTTER VENTILATOR.—Geo. Bassett, Chicago, Ill.

236,587. ROOFING BRACKET.—Hardy M. Hoerner, Fowler, Mich.

236,597. MACHINE FOR BENDING IRON BARS.—Henry Kenny, New York, N. Y.

236,605. FIRE-ESCAPE.—Edward F. McKean, Philadelphia, Penn.

236,616. ADJUSTABLE SCAFFOLD CLAMP.—Erastus S. Palmer, Fairbault, Miss.

236,620. SHINGLE SAWING MACHINE.—Willis J. Perkins, Grand Rapids, Mich.

236,639. VENTILATOR.—Willard H. Smith, Brooklyn, N. Y.

236,651. ROLLING AND FLEXIBLE BLIND.—James G. Wilson, New York, N. Y.

236,660. LOCK.—John W. Post, New York, N. Y.

9,533. (Re-issue). MODE OF HANGING OR FASTENING DOORS.—Chas. N. Earl, Elk River, Minn.

9,534. (Re-issue). ILLUMINATING OR VENTILATING TILE.—Thaddeus Hyatt, New York, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

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

Conrad Darsch, four-sty brick building, 189 and 191 Lexington St., between Paca and Jasper Sts., 24' x 60'.

The Heald Saw and Planing Mill Co., one-sty brick building, on corner of Point and Dock Sts., 80' x 90'.

Five permits were issued for the week.

ALTERATIONS.—Messrs. J. A. & W. T. Wilson, architects, have just finished drawings for alterations to country house for Mr. John S. Gittings, near Baltimore. They include interior finish in yellow pine throughout, parquet flooring, mantels, etc., of walnut and mahogany.

SEWER.—An ordinance will be presented to the City Council at its present session to appoint a commission to inquire into the expediency, and make the necessary report of the costs, etc., of a uniform sewer system for this city.

COURT HOUSE.—The project of the construction of a new Court House will be called to the attention of the City Council by an ordinance for the condemnation of Court House Square.

Boston.

BUILDING PERMITS.—Brick.—Granite St., opposite Richards St., for American Asphalt Paving Co. of New England, asphalt melting house, 23' x 23'.

Washington St. and Union St., for Chas. E. Ricker, restaurant, 30' x 45'; Jas. H. Kelley, builder.

Wood.—Walon St., near Warren St., for David H. McKay, 4 dwell., 23' x 33', two stories, hip roof; David H. McKay, builder.

Granite St., opposite Richards St., for American Asphalt Paving Co. of New England, office, 21' x 25', and engine and boiler house, 34' x 58'.

Belfort St., near Sagamore St., for John H. Worthington, dwell., 16' x 50', two stories; Jas. E. Yates, builder.

Mill St., cor. Greenhill St., for Wm. H. L. Smith, dwell., 41' x 45', two stories and hip; Holbrook & Harlow, builders.

Market St., rear of, near Winship Ave., for Butchers' Slaughtering Association, refrigerator building, 87' x 102', three stories.

Alleghany St., near Parker St., for William G. Thacker, storage of furniture, 12' x 87'; Edw. H. Sawyer, builder.

Walon St., near Warren St., for David H. McKay, 4 dwell., 30' x 35', two stories, hip roof; David H. McKay, builder.

Brooklyn.

BUILDING PERMITS.—Fifty-Fifth St., No. 13, two-sty frame dwell., 20' x 30', tin roof; cost, \$1,000; owner and carpenter, Wm. Bell, Fort Hamilton; mason, Philip Leonhardt.

Chicago.

BUILDING PERMITS.—John Schnoor, two-sty brick dwell., 21' x 50', Burling St., near Centre Ave.; cost, \$2,500.

Henry Martins, ice-house, 24' x 80', Chicago Ave., near Lincoln St.

Albert Mouns, one-sty brick dwell., 21' x 50', Huron St., near Wood St.; cost, \$1,000.

W. Hismacher, two-sty brick dwell., 20' x 46', 24 String St.; cost, \$2,000.

J. Eichmann, same, 23' x 64', 15 Elston Road; cost, \$4,600.

John Rossner, ice-house, 24' x 80', Chicago Ave., near Wood St.

Peter Schmidt, four-sty brick store and dwell., 25' x 75', 461 Chicago Ave.; cost, \$7,000.

M. Bohler, two-sty brick dwell., 21' x 44', 788 Robey St.; cost, \$1,800.

M. M. Rothschild, five-sty brick stores, 50' x 180', 203 and 205 Monroe St.; cost, \$65,000.

W. C. Price, two three-sty brick stores and dwell., 393' x 75', corner State and Illinois Sts.; cost, \$9,000.

J. Senft, two-sty brick dwell., 24' x 50', Nineteenth St., near Loomis St.; cost, \$3,200.

Wm. Stevens, three-sty brick factory, 125' x 125', Throop St., near Twenty-Fifth St.; cost, \$30,000.

E. G. Keith, three-sty brick stores, 37' x 140', Archer and Wentworth Aves.; cost, not stated.

Stewart & Wolcott, two two-sty brick dwell., 36' x 60', 3664 and 3666 Indiana Ave.; cost, \$8,000.

BUILDING STONE.—Pier and footing-stone and Le-mont cutting stock is exhausted; cannot be replenished until March 20. No Marquette brown stone until June.

LABOR MARKET.—

Stonemason..... \$2.50 @ \$3.00

Laborer..... 1.50 @ 1.75

Bricklayer (common)..... 3.00 @ 3.25

" (front)..... 3.50 @ 4.00

Stone-cutter (8 hours)..... 3.00

Carver (8 hours)..... 4.00 @ 4.50

Stone-setter (10 hours)..... 3.50 @ 4.00

Slater..... 2.25 @ 2.50

Tinner..... 2.25 @ 2.50

Plasterer..... 2.75 @ 3.00

Carpenter..... 2.25 @ 2.50

Finisher..... 2.75

Plumber..... 3.00 @ 3.50

Painter..... 2.25 @ 2.50

Grainer..... 3.50 @ 4.00

Louisville, Ky.

IN GENERAL.—Things are very slack here, and although there are few projects yet in architects' hands, yet an early season and numerous large improvements are spoken of.

DISTILLERY.—Outside of the usual number of permits for small buildings and alterations, the only one of importance is for the alteration of the Kentucky Distilling Company, at a cost of \$9,000; W. H. Redin, architect.

Newport, R. I.

HOTEL.—Work has been commenced upon the alterations of the Cliff Cottage Hotel the past week. The addition is to be 35' x 40', basement, two full stories and French roof. The present capacity will be increased

about 25 or 30 rooms; builder, H. A. Kauli; architect, S. S. Ward; cost, about \$5,000.

HOUSES.—G. C. Mason & Son have the plans of a fine house, soon to be built here, about finished; cost, about \$100,000.

The residence of James R. Keene, lately destroyed by fire, is to be rebuilt at once; proposed cost, \$100,000.

ICE HOUSE.—The Newport Ice Co. is building an ice house, 75' x 100'; cost, about \$1,500.

IN GENERAL.—Building is generally reported good, though not as brisk as in former years.

New York.

BUILDING PERMITS.—Greenwich St., cor. Spring St., 4 five-sty brick stores and tenements, 18' 9" x 35'; cost, each \$8,000; owner, S. M. Valentine, 177 Madison Ave.; architect, C. E. Hadden.

Charles St., n. s. 60' 2" e Washington St., four-sty brick shop, 60' and 56' 9" x 35' 8" and 21' 6"; cost, \$6,500; owner, Kimble Dunham, 115 Bank St.; architect, J. B. Snook.

Minetta Lane, n. s. 80' e Sixth Ave., 2 five-sty brick tenements front and rear, 21' x 48' for front house and 21' x 22' for rear; cost, \$6,000 and \$8,000; owner and builder, Benj. F. Bowne, 157 East Ninety-Second St.; architect, M. C. Merritt.

One Hundred and Eighteenth St., n. s. foot of, at Harlem River, two-sty brick machine shop, 50' x 100'; cost, \$7,000; owner, Wm. F. Abendroth, Portchester, N. Y.; architect, Julius Jonson.

One Hundred and Sixteenth St., s. s. 375' e Second Ave., 9 three-sty brown stone dwell., each 16' 8" x 50'; cost, each \$9,500; owner, James Gault, 210 West Fifty-Third St.; architect, Emil Schultze.

Pleasant Ave., cor. One Hundred and Fourteenth St., 3 three-sty brick dwell., 13' 18' 8" and 18' 9" x 35'; cost, each \$5,000; owner, Mary Gill, 451 East One Hundred and Fourteenth St.; architect, J. Thomson; builders, J. H. Summerhayes and G. Fountain.

ALTERATIONS.—West St., Pier 8, North River, one and two-sty wood and iron extension shed, 72' and 38' and 34' x 308'; cost, \$7,500; lessee, F. S. Lathrop, receiver, 119 Liberty St.; architects and builders, Meeker & Hedden.

Front St., No. 281, three-sty brick extensions, 22' 1" and 33' 6" x 40'; cost, \$4,400; owners, Trustees New York and Brooklyn Bridge Co.

Pearl St., Nos. 348, 350 and 552, new roof of iron and brick, and interior alterations; cost, \$7,500; owners, Trustees New York & Brooklyn Bridge Co.; builders, W. H. Hazard & Son.

Broadway, No. 290, altered for offices, iron work, iron stairs, elevator, etc.; cost, \$8,000; owner, G. H. Witthaus, 27 East Seventy-Fifth St.; builders, J. H. Horner and M. F. Finney.

Fourteenth St., No. 5, w. two-sty brick extension, 25' x 50', tin roof, front alterations; cost, \$8,000; owner, F. J. Greve, 5 West Fourteenth St.; architect, H. R. Marshall; builders, J. & W. C. Spears.

FULTON MARKET BUILDING.—About two months ago, Judge Van Brunt, in Common Pleas, Chambers, made an order directing the Fire Department to take measures to make the Fulton Market building secure. On December 31 the Board of Apportionment appropriated \$80,000, at the request of the Commissioner of Public Works, for the repair of the building. This fact was brought to the notice of the court by affidavits made by Commissioner Thompson, Controller Campbell, and others, and Judge Van Brunt then made an order staying the proceedings of the Bureau of Inspection of Buildings in the Fire Department under his previous order. Commissioner Thompson will, therefore, have full control of the changes in the Fulton Market building.

HOUSE.—Mr. Stewart has sold the property corner of Sixty-Third St. and Fifth Ave. for \$160,000, and it is understood the purchaser intends building a large mansion on the lot.

STABLES.—It is said the Adams Express Co. proposes building extensive stables this spring in the neighborhood of Forty-Eighth St.

ALTERATIONS.—Mr. S. D. Hatch has prepared plans for the alteration of the residence on Tenth St., between First and Second Aves., belonging to the Stuyvesant House, which will be used for flats; probable cost, about \$4,000.

BACHELORS' HALL.—The house on the corner of Waverley Place and Mercer St. is to be altered into bachelors' apartments, from designs of Messrs. Hatfield.

Philadelphia.

BUILDING PERMITS.—Thirty-First St., north of Jefferson St., two-sty ice-house, 68' x 191'; J. B. Doyle, contractor.

Garnett St., south of Somerset St., weave shop, 15' x 30'; Jas. Creighton, owner.

ADDITIONS AND ALTERATIONS.—823 Market St., one-sty addition and front alterations, 21' x 47'; John Foreman, contractor.

WAREHOUSE.—Peter Wright & Sons, at 305 Walnut St., will build a six-sty fire-proof building, 20' x 116', soon; plans, by Addison Hutton, architect, being completed and bids being received.

BRICKS.—"Stretchers," \$9.00 @ \$12.00. The general feeling existing is that a good demand with better prices will pervade the whole market in the near future.

St. Louis.

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

OWNERS' NAME. USE. Sq. ft. Cost.

Mulanphy Planing Mill Co. Planing Mill, 2 3 \$8,000

F. Ebbert, Dwell., 12 12 3,000

J. M. Randall, Store, 5 5 5,000

J. W. Kauffmann, Warehouse, 3 3 5,000

General Notes.

BINGHAMTON, N. Y.—The indications now are that the year 1881 will be one of great activity. Mr. T. I. (Continued on next page.)

Publishers' Department.

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and Building News.

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New Advertisements.

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Work. Page v.BATES & JOHNSON (New York), Steam Warming
Apparatus. Page i.

WANTED (Media, Pa.), Assistant. Page 48.

JAMER, JACOBS & CO. (New York), Steam Heating
Apparatus. Page i.BOSTON SOCIETY OF DECORATIVE ART (Boston)
Prizes for Designs in Art Needlework. Page v.HOME INSURANCE COMPANY OF NEW YORK
(New York), Fifty-Fifth Semi-annual Statement. vii.BALTIMORE TERRA-COTTA CO. (Baltimore, Md.),
Architectural Terra-Cotta. Page vii.

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ing, of four years standing, of McGill University,
Montreal, and since had experience in an architect's
office. Best of references. Terms moderate. Address:
Drawer 244, Ogdensburg, N. Y. 266

WANTED.

COMMUNICATIONS from parties in towns of the
West and Northwest, having a population of
10,000 and over, who keep themselves posted on build-
ing operations in their respective towns. Address
stating present occupation, "Opportunity," in care of
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BUILDING INTELLIGENCE.

Lacey has prepared plans for the following build-
ings, all of which are to be commenced early in the
spring:A house for Gen. E. F. Jones, located at Jones
Place, first story brick, second wood; cost, \$6,000.A house for B. M. Babcock, on Main St.; first-
class wooden structure; cost, \$7,000.A cottage for Frank D. McGowan, on Chapin St.;
cost, \$2,500.House for C. L. Saunders, on Carroll St.; cost,
\$4,000.Also a four-st'y brick block, fronting on Washing-
ton and State Sts., with 56' depth, 156' to be used for
furniture and hardware stores; cost, \$20,000.CONHASSET, MASS.—Mr. O. F. Smith, of Boston, is
drawing plans of a house for Dr. Harold Williams.
It will be two stories high, pitch roof, 37' x 42', L
18' x 22'; cost, \$6,000.DENVER, COL.—The most costly buildings in course
of construction are the Union depot, at a cost of
\$400,000, and Taber's Opera House, to cost \$300,000.FREDERICKSBURG, VA.—Lodge No. 4 of Masons of
this city has determined to build here a Washington
memorial Masonic temple. The proposal has re-
ceived the approval of the Grand Lodge of Virginia.GERMANTOWN, PA.—Plans are being drawn by D. S.
Gendell, architect, for a building for the Second
Baptist Church; size, 75' x 120'; to be built of Falls
Schuylkill stone; cost, \$25,000.HAGERSTOWN, MD.—Mr. Jackson C. Gott, architect,
Baltimore, is preparing drawings for 3 stores for Mr.
Hunnehouse, to be 52' x 82', four stories and base-
ment, of brick, with terra-cotta and moulded brick
finish.HARRISBURG, PA.—Mr. Frank E. Davis, of Balti-
more, is preparing drawings for a cottage to be built
in Dauphin county, near Harrisburg, Pa., for Mrs.
Colder, to be 44' x 33', two stories and attic; cost,
\$6,000.HARTFORD, CONN.—T. M. Allen, of this city, is going
to build a memorial chapel in Spring Grove cemetery
partly as a memorial of the Allyn family, and also
to afford accommodation for holding funeral ser-
vices in inclement weather. It will cost about
\$40,000.

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book-stores, they will be sent, postpaid, on receipt of
the price by the publishers.

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BUILDING INTELLIGENCE.

HELENA, MONTANA T.—Mr. T. I. Lacey, of Bing-
hamton, N. Y., has prepared plans for a stone hotel,
with brick front; cost, \$20,000; V. C. Rinda, pro-
prietor.LYNCHBURG, VA.—A large amount of the building
materials used in this city are bought at the North.
Thousands of dollars are spent annually at the
North by the people of this growing city, in iron
fronts, gas and water fixtures, heating apparatus,
glass, hardware, inside decorations, and all manner
of inside finishing in general.NEWPORT, R. I.—Mr. Clarence S. Luce, of Boston,
Mass., has completed plans of four summer cottages
for Pierre Lorillard, costing about \$20,000.OSTERVILLE, MASS.—E. A. P. Newcomb, architect,
of Boston, enlargement of the Cotocheeset House.OXFORD, MD.—The Delaware & Chesapeake Railroad
will commence operations, as soon as the weather
opens, on the 180' addition to their pier at Oxford,
Md. The Company also contemplates the erection
of a grain elevator at the same place at an early
day.REVERE, MASS.—A long pier will be built off Cherry
Island Bar, and a large hotel and café erected near
by, with a long promenade. There are a number of
other improvements contemplated, but nothing definite
is settled upon at present.SAINT MARIE, ILL.—E. A. P. Newcomb, of Boston,
has prepared plans for a small station for the Dan-
ville, Olney & Ohio River Railroad.TURNER'S FALLS, MASS.—The new four-story hotel
of Everett Bros. is now roofed in, and will be fin-
ished early in the spring.VERGENNER, VT.—The Trustees of the Reform School
propose to build an addition to the school building
that will contain sleeping apartments, a reading
room, a gymnasium hall, and a hospital ward. The
Trustees will hold a meeting in a few weeks to com-
plete their plans for the new building.

Industrial.

AUBURN, N. Y.—D. M. Osborne & Co. have contracted
for 2,000,000 bricks for additions to their mower and
reaper factory.PEERLESS
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BUILDING INTELLIGENCE.

CHICAGO, ILL.—The Grey Iron Company will shortly
begin work on a fine building for manufacturing
purposes, on the corner of Kingsbury and Erie Sts.
The proprietors of the Lake Shore Country have
recently purchased two blocks, Nos. 73 and 100, in
the town of Cornell or Grand Crossing on South Chi-
cago Ave., near Stony Island Boulevard, for \$5,000,
and will immediately begin to build a foundry for
castings, which will give employment to three hun-
dred and fifty men.CHICOPEE, MASS.—Belcher & Taylor are to build an
addition to their agricultural tool works.SPENCER, MASS.—It is rumored that a boot factory
is likely to be built on Wall St., near the railway
station, by a new firm composed of Spencer parties,
but the project has not taken definite shape yet.The block recently burned, at the corner of Main
and Elm Sts., will probably be rebuilt in the spring.

Bids and Contracts.

CHICOPEE, MASS.—Lynch & Burton have contracted
to do the stone-work for A. L. Williston's \$25,000
residence at Florence. The stone will be New
Hampshire granite and Longmeadow free-stone.SIDNEY, O.—The County Commissioners have awarded
the contract for the iron work of the new Court
House to H. P. Clough & Co. of Middletown,
for \$30,050. This firm brought suit against the Com-
missioners in the Supreme Court for not granting
them the contract at the first letting, but the Court
decided in favor of the Commissioners. This time
they put in two bids, and were given the work on the
lowest bid.FROM AN ARCHITECT OF DES MOINES, IO.—
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