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ONE of the most interesting documents yet issued by the Department of Labor at Washington is Number 28, devoted principally to the subject of Arbitration in Great Britain. To us who are now witnessing the miserable spectacles of the street-car strike in St. Louis, and the struggle in the building-trades in Chicago, a treatise which shows how strikes have been avoided for thirty years in some of the most important industries in Great Britain cannot fail to be of the deepest significance. It is hardly necessary to say that this end has, in all cases, been brought about by the establishment of joint boards of masters and workmen, sometimes with and sometimes without an independent arbitrator; but the details of the history of these boards for a quarter of a century are curious. In the beginning, as it appears, the men, in accordance with the teachings of our Socialist friends, were disposed to regard the masters as their natural enemies, and to look upon their proposals with distrust. In some instances, they refused to agree to the appointment of a board of conciliation, unless an arbitrator, outside the trade, were also selected; and the Nottingham lace-makers, once among the most turbulent of English operatives, insisted on having the Government Board of Trade as a tribunal of appeal. The principle of conciliation and mutual discussion once established, however, a resort to appeal was rarely found necessary. It is due to the employers in the great industries to say that, according to the testimony of their own workmen, they have uniformly shown a fair and "gentlemanly" spirit. Instead of a "struggle for life" around the council-board, the men have found themselves engaged in frank and considerate discussion of matters of the deepest interest to both parties, in which their opinions were sought and valued; and for a generation some of the most important industries, notwithstanding the disturbances brought about by foreign competition, have been kept smoothly running by means of the common understanding and mutual confidence produced by this simple means. In the North of England iron-and-steel manufacture only three cases have been submitted to the referee in thirty years; and in another industry not one has ever been so submitted; and it is now a common saying among English workingmen, that if a joint board of masters and men cannot get at the rights of a question in their own trade, an outsider is not likely to understand it. More than this, the men, in response to the confidence of the masters, have shown a scrupulousness in carrying out their agreements which is extremely creditable, and in some cases even amusing. In all the trades, apparently, where the boards of conciliation are well established, the workmen are the first to resent any disposition to question or disobey their awards. In Nottingham, where, in consequence of foreign competition, a reduction in wages of twenty per cent was agreed upon by the joint board, seventeen men only refused to be bound by the decision. These men were not only discharged, with the consent of the other men, but were so shunned and disliked by them that they were obliged to walk the streets for two years before they succeeded in obtaining work. In the boot-and-shoe trade, in a somewhat similar manner, where a London local union had

ordered a strike, instead of referring its troubles to the national board of conciliation, a fine of three hundred pounds was imposed upon it. "We hope," said the authors of the next monthly report of the national union, "that this will be a warning to executives not to break away from rules and agreements entered into; for, while the agreements are in existence, we have every desire that they shall be honorably carried out by both sides." On the side of the masters, the new system is not less advantageous than it is to the men, for the reason that they can depend on having their work go on regularly and systematically, at specified wages, and can make contracts with certainty as to the cost of their goods, and the time at which they can deliver them. All this, to a degree which no one, perhaps, but a manufacturer can estimate, helps them to produce at a low price, to keep their mills busy without holding in reserve a large capital as a contingency fund for labor troubles, or other hazards, and to keep their customers by not disappointing them.

THE death of Clarence Cook deserves to be noticed by any journal which pretends to an interest in the Fine-Arts. Although his work belonged rather to the past generation, he was, in that generation, a considerable force, and his influence was generally exerted in the direction of the sincerity and independence which, at that time, American art so much needed. His usefulness in this way was probably diminished by the exaggerated violence of his criticisms, but this has been, ever since the days of Ruskin, a common characteristic of English-speaking critics of art; and, on the whole, Clarence Cook did much good in a field with which he was more familiar than most of the critics of his day. We suppose that few school-children of the present generation have ever heard of the little poem, "The Legend of Abou Ben-Adhem," which first introduced Clarence Cook to the public, and which for many years figured in nearly every grammar-school reading-book, was parodied in a thousand forms, and really deserved its extraordinary popularity. This, if not his only poetical essay, was the most successful one, and he soon became known as a clever and vigorous essayist, with, particularly, a good knowledge of artistic matters, and convictions in regard to them. If not one of the founders of the Truth-in-Art Society in New York, he was, at least, one of the earliest and most enthusiastic members of an organization which deserves to have its history written while some of those who helped to establish it still survive. It is hardly necessary to say that a brilliant writer, who had ideas on the subject of sincerity and naturalism in art, found plenty of material for comment in the works of the American artists of the period of the Civil War, and no one was, perhaps, more hated by a large part of the artistic world than Clarence Cook. As a rule, his criticisms found favor with the public, but he probably injured his influence to a certain extent by his over-enthusiastic partisanship in the Feuardent-Cesnola controversy, famous twenty years ago. The public of the present day perhaps needs to be reminded that General di Cesnola, then, as now, director of the Metropolitan Museum of Fine-Arts, in New York, brought from Cyprus, where he had been for many years consul of the United States, an extremely interesting and beautiful collection of Cypriote antiquities. This collection became the property of the Metropolitan Museum, and formed for a long time its principal treasure. Naturally, the statuettes and other objects were found in fragments, and it was necessary to piece them together. This was done with all the skill and care available, but it is very probable that, in some cases, mistakes were made. There is hardly a gallery of antique sculpture in Europe, particularly in Rome, where gross errors have not been made in joining fragments, and it would be strange if General di Cesnola and his assistants did not occasionally join, out of a mass of weather-worn fragments, pieces not originally connected. As it happened, however, Mr. Gaston L. Feuardent, son of a noted Parisian collector and dealer in antiquities, and himself an expert, being in New York, and interesting himself in the operations at the Museum, discovered what seemed to him misfits in the statuettes, and published statements calling attention to them. Instead of replying that such things were inevitable, which every one could have seen to be true, some of the partisans of the Museum retorted with denials and personalities, which called forth more vigorous attacks from Mr. Feuardent,

who denounced the collection as a "patchwork of unrelated parts." As the patriotic pride of the New Yorkers inclined them to the opinion that they possessed a collection of perfect Greek antiquities, Mr. Feuardent was getting rather the worst of the controversy, when Clarence Cook took his side, with an energy which was more interesting than edifying. The Museum authorities wisely kept silent through the discussion, which was terminated by the death of Mr. Feuardent, some time afterwards; but, since then, Mr. Cook's name has not been conspicuous in artistic discussions. He published, however, occasional articles on house decoration and furnishing, and edited several books on these subjects.

THE struggle between the Building Trades' Council and the Contractors' Council in Chicago continues, without sign of retreat on either side. Apparently, the contractors have determined to put an end to the dictation of the unions, which, it must be confessed, by their wanton exercise of power, while they possessed it, have invited retaliation. Meanwhile, the men, who have been idle for fifteen weeks, are suffering. Many of them are seeking work outside the jurisdiction of the unions at such wages as they can get, and the number of these sensible persons is likely to increase, especially as the Union funds are low, and only slight assistance can be given from this source. So far as now appears, building operations in the city will hardly be resumed this season, even if a settlement should be effected, and the unfortunate men and their still more unfortunate families must look forward to a long season of want, which they owe mainly to the folly and arrogance of their leaders, increased, as is the case generally in this country, by the petting of politicians. If the workmen of Chicago would make up their minds at the next election to vote against any candidate who takes labor-agitators into his confidence, they would do much to keep the business of looking out for their interests, which they have a perfect right to delegate to others, in the hands of people who will attend to their duty in a rational manner, and will not make cats'-paws of their industrious constituents to gather private chestnuts, in the way of political influence, for themselves.

THE *Record and Guide* gives an account of the Parisian building-laws which contains some errors. Under ordinary circumstances these would not be important, but, as the Parisian building regulations are frequently quoted in this country before committees of Legislatures and municipal governments, it is desirable to have them correctly stated. The *Record and Guide* says that, at present, "No building (under the laws of 1884) is allowed more than six stories, no matter how wide the street or avenue may be." As nearly all the buildings that have been erected in Paris since 1884 are at least seven stories high, and hundreds of them have eight stories above the basement, while one new structure, to our knowledge, has ten stories above ground, it is obvious that there is some mistake here, and the mistake probably consists in supposing that the restriction on the height of the vertical walls fronting on the streets is a restriction on the entire height of the building. As a matter of fact, the law says nothing about the number of stories, providing simply that the height of the vertical front wall shall not, in any case, exceed twenty metres, or about sixty-five feet, and that the section of the front portion of the roof shall be inscribed in an arc with a radius of not more than eight-and-one-half metres, or about twenty-seven-and-one-half feet, tangent to the vertical face of the wall. Ordinarily, the Parisian architects content themselves with six stories and a basement in the sixty-five feet of vertical wall, one good story in the Mansard roof, with handsome stone dormers, which are allowed to project beyond the specified arc, and another story in the upper slope of the roof, lighted by skylights, or by small, lead-covered dormers; but three stories are sometimes put in the roof, and there is nothing in the law to prevent putting seven stories, instead of six, in the vertical front wall. The roof-profile prescribed for street fronts is not required on rear or courtyard elevations, and the vertical wall is here usually carried to the full height of the building. The plan for modification of the present law, which is now under consideration by the Government, does not essentially change the provisions for the height of vertical walls and limiting profile of roofs, but allows greater liberty in building projections over the streets, and in carrying up towers or domes, in place of simple dormers, beyond the roof-profile.

WE are often told by laymen and amateurs that it would be desirable to adopt the Parisian regulations in our cities, but the people who propose such a thing forget the difference in climate, which would make mansards, nearly thirty feet high, discharging snow all winter from a height of sixty-five feet upon the sidewalks, intolerable in any city north of Mason and Dixon's line. In some of our cities, as in Boston, the mansard prevails to a considerable extent, but in these cases there is always a reserved space between the house-front and the sidewalk, into which the snow can fall harmlessly; while no such reserved space is known in Paris, except in the very aristocratic streets of the Parc Monceau quarter, and on the Avenue du Bois de Boulogne, and snow from the roofs, if there were any, would fall directly on the sidewalks. There is, or was, a regulation in New York providing that the roofs of all buildings fronting on a street must slope away from the street, so as to prevent dripping from overflowing gutters upon the sidewalk, and this is the principle from which our regulations of the kind must start. The Parisians permit owners to put two or three stories in a mansard roof, because the roof cuts off much less light and air from the street than would be cut off by a vertical wall of the same height; but, as mansards are out of the question for us, on account of our climate, we must preserve the light and air of our streets by some other means, which, we may remark, American architects are quite capable of devising whenever they are called upon for such service.

THE movement for connecting New York and Brooklyn by tunnels, rather than bridges, seem to be rapidly growing, and the next decade will probably see the completion of several submarine roads, joining Long Island with Manhattan at various points. The great advantage of a tunnel, that it is only necessary to descend a few feet to reach it, instead of ascending more than a hundred feet, as is necessary where a bridge crosses a navigable stream, will go far to counterbalance the objection which most people feel to underground travel, and it is probable that all the routes will soon become popular. It is curious to notice that the Boston Subway, with its white walls and brilliant electric-lights, is often referred to in describing projects for tunnels, and it is quite possible that the success of this structure, in the matter of cheerfulness and ventilation, may be the cause of a great change in public feeling in regard to tunnels. Meanwhile, although one new bridge is in process of construction over the East River, and at least four tunnels are talked about, nothing seems to be heard of the Hudson River tunnel, which is nearly completed, and would probably be, if reasonably well managed, the most profitable of all, since it would give the only land communication, not between Long Island and New York, but between New York and the whole continent. Some one has said that a vivid imagination is indispensable to a successful business man; and if capitalists could adequately picture to themselves the difference in comfort to a family, let us say, travelling from Harlem to Washington, between lumbering down, with their trunks, in a carriage, at an enormous expense, to the ferry, transferring their handbags, bundles, babies, rugs, umbrellas and lunch-baskets to the ferry-boat, while their trunks are precipitated after them by the baggage-men, and, after tiresome waiting, followed by an uncomfortable transit, dragging the handbags, bundles, babies, rugs, umbrellas and lunch-baskets through roundabout paths to the train, the trunks meanwhile undergoing a second scene of violence, and the process, which the tunnel would make practicable, of boarding the train at any Harlem station, and remaining in it undisturbed until it had reached its destination, they would, as it seems to us, hasten to rescue the enterprise from its present neglect, and put it in condition to earn dividends.

M. DESPRADELLE, Professor of Architectural Design in the Massachusetts Institute of Technology, has been awarded a first-class medal at the Paris *Salon* of 1900, for his design for a monument in commemoration of American attainments in the arts, if we remember rightly its title. The composition, as we recollect it, consisted mainly of an enormous obelisk, but very cleverly treated with accessories to give it interest and scale. M. Despradelle showed also at the *Salon* his design, made in association with Mr. Codman, for the buildings of the University of California. The profession in this country, with which M. Despradelle has already identified himself, will, while congratulating him on his success, receive it as, to a certain extent, a compliment to American architecture.

ARCHITECTURAL ACOUSTICS.¹ — VI.

REVERBERATION: THE ABSORBING POWER OF AN AUDIENCE, AND OTHER DATA.

IN this paper will be given all the data ordinarily necessary in calculating the reverberation in any auditorium from its plans and specifications. In order to show the degree of confidence to which these data are entitled a very brief account will be given of the experiments by means of which they were obtained. Such an account is especially necessary in the case of the determination of the absorbing power of an audience. This coefficient is, in the nature of things, a factor of every problem, and in a majority of cases it is one of the most important factors; yet it can be determined only through the courtesy of a large number of persons, and even then is attended with difficulty.

The formulas that will be used for the calculation of absorbing power are numbers (13) and (15) in the preceding paper, the correcting terms being at times of considerable importance. The application of these formulas having been illustrated, the whole discussion here will be devoted to the conditions of the experiments and the results obtained.

In every experiment the unavoidable presence of the observer increases the absorbing power. In small rooms, and in large rooms if bare of furniture, the relative increase is considerable, and should always be subtracted from the immediate results of the experiment in order to determine the absorbing power of the room alone. The quantity to be subtracted is constant, provided the same clothes are always worn, and may be determined once for all. For this determination another observer made a set of experiments in a small and otherwise empty room before and after the writer had entered with a duplicate set of apparatus — air-tank, chronograph, and battery. In fact, two persons made independent observations, giving consistently the result that the writer, in the clothes and with the apparatus constantly employed, had an absorbing power of .48 of a unit. For the sake of brevity no further mention will be made of this, but throughout the work this correction is applied wherever necessary.

In the second paper of this series a preliminary calculation was made of the absorbing power of certain wall-surfaces, and the object in so doing was to get an approximate value for the absorbing power of glass. It had already been decided that the most convenient unit of absorbing power was a square metre of open window. It is evident, however, that the process of opening a window during the progress of an experiment is merely substituting the absorbing power of the open window for that of the same window closed, — a consideration of possible moment in the nicer development of the subject. This preliminary calculation was in anticipation of and preparation for the more close analysis in the fifth paper. If these coefficients are now recalculated, using the corrected formulas of the fifth paper, we arrive at the following results: Cement and brick set in cement .025, glass .027 and wood sheathing .061.

The experiments in the Boston Public Library gave results that are interesting from several points-of-view. The total absorbing power of the large lecture-room was found to be 38.9 units distributed as follows: A platform of pine sheathing, exposing a total area of 70 square metres, had an absorbing power of $70 \times .061 = 4.3$; 72 square metres of glass windows had an absorbing power of $72 \times .027 = 1.9$; three large oil-paintings, with a total area of 17.4 square metres, had an absorbing power of $17.4 \times .28 = 4.9$; the remainder, 27.8 units, was that of the cement floor, tile ceiling, and plaster on tile walls, in total area 1,095 square metres. This gives as the coefficient of absorption for such construction .0254. A similar calculation of results obtained in the attendants' room in the same building — a room in which the construction of the floor, walls, and ceiling, is similar to that in the lecture-room — gives for the value of the coefficient, .0255. The very close agreement of these results, and their agreement with the coefficient, .0251, for cement floor and solid walls of brick set in cement in the Constant-temperature Room, is satisfactory and interesting. However, a far more interesting consideration is the following:

Heretofore in the argument it has been assumed, tacitly, that the total absorption of sound in a room is due to the walls, furniture and audience. There is one other possible absorbent,

and only one — the viscosity of the vibrating air. It is now possible to present the argument that led to the conclusion that this, the viscosity of the air throughout the body of the room, is entirely negligible in comparison with the other sources of absorption. These two rooms in the Boston Public Library — the lecture-room and the attendants' room — had, in their bare and unfurnished condition, less absorbing power in the walls than any other rooms of their size yet found. Therefore, if the viscosity of the air is a practical factor it ought to have shown in these two rooms if ever. Fortunately, also, the two rooms differed greatly in size, the volume of one being about thirty-five times that of the other, while the ratio of the areas of the wall-surfaces was about twelve. That portion of the absorption due to the walls was proportional to the areas of the walls, and that portion due to the viscosity of the air was proportional to the volumes of the rooms. As a matter-of-fact the experiments in these two rooms showed that the whole absorbing power was accurately proportional to the areas of the walls; how accurately is abundantly evidenced by the agreement of the two coefficients .0254 and .0255, deduced on the supposition that the viscosity of the air was negligible. To express it more precisely, had the viscosity of the air been sufficient to produce one-fiftieth part of the absorption in the attendant's room, these two coefficients would have differed from each other by 4 per cent, an easily measurable amount. It is safe to conclude that in rooms as bare and non-absorbent as these the viscosity of the air is inconsiderable, and that in a room filled with an audience it is certainly wholly negligible. Rooms more suitable for the demonstration of this point than these two rooms in the Boston Public Library could hardly be designed, and access to them was good fortune in settling so directly and conclusively this fundamental question.

The experiments to determine the absorbing power of plastered walls show it to be variable. If the plaster is applied directly to tile or brick the absorbing power of the resulting solid wall is uniformly .025. But if the plaster is applied to lath held out from the solid wall by studding the absorbing power is not nearly so constant, varying in different rooms. The investigation of this has not been carried far enough to show with absolute certainty the cause, although it probably arises from the different thickness in which the plaster is applied. For the examination of this point two modes of procedure are possible, — experimenting in a large number of rooms, or experimenting in one room and replastering in many different ways. The objection to the first method, which appears the more available, is that it is almost impossible to get accurate information in regard to the nature of a wall unless one has complete control of the construction. Moreover, there are probably interesting variations that cannot be found in use, but that, if tried, would be fruitful in suggestions for future construction. The second method — experimenting in one room, plastering and replastering it with systematic variations and careful analysis of the construction in each case — would be the most instructive, but the expense of such procedure is, for the time being, at least, prohibitive. Among the interesting possibilities, of which it can only be said that the experiments so far point that way, is that with time the plastered walls improve in absorbing power; how rapidly has not been shown. This change can be due, of course, only to some real change in the nature of the wall, and the most probable change would be its gradual drying out. Experiments in four rooms with plaster on wood lath gave as the average absorbing power per square metre .034 of a unit. Experiments in eight rooms with plaster on wire-lath gave as the average coefficient of absorption .033. In both cases the variation among the different rooms was such that the figure in the third decimal place may be greater or less by three, possibly, though not probably, by more. The fact that a considerable part of the wall-surface of several of the rooms was of uncertain construction is partly responsible for this uncertainty in regard to the coefficient. For the sake of easy reference and comparison these results are tabulated, the unit being the absorbing power of a square metre of open window area.

ABSORBING POWER OF WALL-SURFACES.

Open window.....	1.000
Wood-sheathing (hard-pine).....	.061
Plaster on wood-lath.....	.034
Plaster on wire-lath.....	.033
Glass, single thickness.....	.027
Plaster on tile.....	.025
Brick set in Portland cement.....	.025

¹A series of papers by Wallace C. Sabine, Assistant-Professor of Physics at Harvard University. Continued from No. 1274, page 61.

Next in interest to the absorbing power of wall-surfaces is that of an audience. During the summer of 1897, at the close of a lecture in the Fogg Art Museum, the duration of the residual sound was determined before and immediately after the audience left. The patience of the audience and the silence preserved left nothing to be desired in this direction, but a slight rain falling on the roof seriously interfered with the observations. Nevertheless, the result, .37 per person, is worthy of record. The experiment was tried again in the summer of 1899, on a much more elaborate scale and under the most favorable conditions, in the large lecture-room of the Jefferson Physical Laboratory. In order to get as much data and from as independent sources as possible, three chronographs were electrically connected with each other and with the electro-pneumatic valve controlling the air-supply of the organ-pipe. One chronograph was on the lecture-table, and the other two were on opposite sides in the rear of the hall. The one on the table was in charge of the writer, who also controlled the key turning on and off the current at the four instruments. The other two chronographs were in charge of other observers, provision being thus made for three independent determinations. After a test had been made of the absorbing power of the whole audience—157 women and 135 men, sufficient to crowd the lecture-room—one-half, by request, passed out, 63 women and 79 men remaining, and observations were again made. On the following night the lecture was repeated and observations were again taken, there being present 95 women and 73 men. There were thus six independent determinations on three different audiences, and by three observers. In the following table the first column of figures gives the total absorbing power of the audience present; the second gives the absorbing power per person; the initials indicate the observer.

	Observer.	Total Absorbing Power.	Absorbing Power per Person.
First night, whole audience,	W. C. S.	123	.42
" " half "	G. LeC.	113	.39
" " " "	W. C. S.	58.3	.41
" " " "	G. LeC.	58.3	.41
Second " whole "	W. C. S.	66.2	.40
" " " "	E. D. D.	64.6	.39
			.40 (3)

In view of the difficulties of the experiment the consistency of the determination is gratifying. The average result of the six determinations is probably correct within two per cent.

It is to be noted, however, that this value, .40, is the difference between the absorbing power of the person and the absorbing power of the settee and floor which when the audience left the room took its place as an absorbent. It is evident that the experiments determined the difference between the two, while in subsequent calculations we shall be concerned with the absolute absorbing power of the audience. To determine this, on a following night all the settees were carried out of the room, observations being taken before and after the change. From the data thus obtained the absorbing power of each settee accommodating five persons was found to be .039, or for a single seat .0077. Of necessity the floor still remained, but from a knowledge of its construction the absorbing power of as much of the floor as is covered by one person was calculated to be .030. Adding these together we get as the absorbing power of an audience, seated with moderate compactness, .44 per person.

In some subsequent work it will be necessary to know the absorbing power of an audience, not per person, but per square metre, the audience being regarded broadly as one of the bounding surfaces of the room. As each person occupied on an average .46 of a square metre of floor-area, it is evident that the absorbing power per square metre was .96 of a unit.

Under certain circumstances the audience will not be compactly seated, but will be scattered about the room and more or less isolated, for example in a council-room, or in a private music-room, and it is evident that under these conditions the individual will expose a greater surface to the room and his absorbing power will be greater. It is a matter of the greatest ease to distinguish between men and women coming into a small room, or even between different men. In fact, early in the investigation two months' work—over three thousand observations—had to be discarded because of failure to record the kind of clothing worn by the observer. The coefficients given in the following table are averages for 3 women and for

7 men, and were deduced from experiments in the Constant-temperature Room.

ABSORBING POWER OF AN AUDIENCE.

Audience per square metre.....	.94
Audience per person.....	.44
Isolated woman.....	.54
Isolated man.....	.48

When an audience fills the hall one is but little concerned with the nature of the chairs—acoustically, but, otherwise, this becomes a matter of considerable importance. The settees in the lecture-room of the Physical Laboratory, already mentioned, are of plain ash, and have solid seats and vertical ribs in the back; they are without upholstering, and it is interesting, in order to note the agreement, to compare the absorbing power of such settees per single seat, .0077, with that of the "bent wood" chairs in the Boston Public Library, .0082, which are of very similar character. In contrast may be placed the chairs and settees in the faculty-room, which have cushions of hair covered with leather on seat and back. In the same table will be entered the absorbing power of Sanders Theatre cushions, which are of hair covered with canvas and light damask, and of elastic-felt cushions—cotton covered with corduroy.

ABSORBING POWER OF SETTEES, CHAIRS, AND CUSHIONS.

Plain ash settees.....	.038
" " " per single seat.....	.0077
" " chairs "bent wood".....	.0082
Upholstered settees, hair and leather.....	1.10
" " " per single seat.....	.28
" " chairs similar in style.....	.30
Hair cushions per seat.....	.21
Elastic-felt cushions per seat.....	.20

A case has arisen even in the present paper where it was necessary to know the absorbing power of paintings on canvas, and the question may not infrequently arise as to how much service is secured—or injury incurred—acoustically by their use in particular rooms. The oil-paintings in the faculty-room, 19 in number, with a total area, 19.9 square metres, gave opportunity for the determination of the desired coefficient; but a question arises in regard to the method of reckoning the area. Thus, different coefficients are obtained according as one measures the canvas only, or includes the frames. The latter method, on the whole, seems best, although most of the absorption is probably by the canvas.

The coefficient for house-plants, which may be of passing, and possibly practical, interest, was even harder to express. A greenhouse, 140 cubic metres in volume, and in which plants occupied about one-quarter of the space, showed an absorbing power greater than that due to the walls and floor by 4 units, or .11 per cubic metre. It would be of greater value to determine the absorbing power of such plants as are used, often very extensively, in decorating on festival occasions, but no opportunity has yet presented itself.

Among the cloths used in decorations, cheese-cloth and cretonne may be taken as types. The first is an American gauze, 48 grammes to the square metre. The second is an ordinary cotton-print cloth, 182 grammes per square metre. Shelia, an extra quality of chenille, is a regular curtain material used only in permanent decorations.

Linoleum and cork-tile are commercial products, the first used as floor-covering and the second in walls. Both were tested lying loosely on the floor; their values cemented in place would probably be different.

The carpet-rug is a heavy pile carpet about .8 centimetres thick.

In the following table the values are per square metre, except in the case of plants where the coefficient is per cubic metre:—

MISCELLANEOUS.

Oil-paintings, inclusive of frames.....	.28
House-plants.....	.11
Carpet-rugs.....	.20
Oriental rugs, extra heavy.....	.29
Cheese-cloth.....	.019
Cretonne cloth.....	.15
Shelia curtains.....	.23
Hair-felt, 2.5 cm. thick, 8 cm. from wall.....	.78
Cork, 2.5 cm. thick, loose on floor.....	.16
Linoleum, loose on floor.....	.12

WALLACE C. SABINE.

[To be continued.]

EXHIBITION OF LOCAL ARTISTS AT THE CORCORAN GALLERY OF ART.



ERNEST FLAGG'S building for the Corcoran Gallery of Art enjoys the rare advantage of a fair setting. Across a broad and lovely foreground, and through the fine old trees of the President's grounds, it gleams in the snowy translucence of white marble, a chaste temple of the arts, a white-robed vestal among buildings. Of winter evenings, with the sun going down behind it, the opal tints of the winter sky, reflected from its skylights, gave it a jewelled crown. Now, in the

first warm days of a full-leaved summer, a glimpse of its cool marble flanks, across the grass and between the flowering shrubs, is rest and delight. Within the portal, too, there is repose. It is a white and quiet place.

From the atrium the eye follows across, between the tall Doric columns of a great hall, to a broad and stately stair, and is gently led up to rest upon a simple niche, centred in the wall of the first landing, within which a white figure stands. One rather resents the brilliant coloring of a pair of great vases set upon this landing against the feet of the upper runs. One wants marbles there, or at most, in strength of color-value, bronzes. Between the columns of the lower hall, which stand baseless on the marbled floors, one sees groups of statuary. As the eye is raised to the balustrade of the gallery above it notes a jarring tone in the yellow oak of the railing. A pity it is not of stone, or, if the lesser material were required by economy, that is not painted white, as it is across the head of the staircase.

So far, Mr. Flagg's art has given us the unintrusive beauty of constructive architecture and effects in which decoration plays no part. Coming into his building, perhaps fresh from the surfeit of gilding and painting which the riotous profusion of decorated surfaces in the Library of Congress gives us, we may find here rest for the tired brain in beauty unadorned. But once on the upper landing, this enjoyable sense of repose is quickly dissipated as one glances about the gallery, on whose walls are displayed the exhibits of local artists, which, in fact, we have come to-day to see. It cannot be said that the key-note here is reserve. Far from it. Here we have a lot of artists scraping and banging away upon a very full — and loud — gamut of color, indeed. And not until the ear has grown used to the bray of the brasses and the din of the heady drums can one catch the voices of the viols singing sweet and true here and there through it all. And — before we drop the well-worn old metaphor — we are fain to ask, why do unskilled performers invariably choose such difficult pieces, and why do they so persistently try to foist upon us mere noise for music?

One's first impression on glancing about this gallery brings the unwelcome conviction that Turner must have been a good deal madder toward the end than one cares to believe, and more incredibly prolific. From every wall Turners seem to be looking down by dozens. There would be enough of them to restock the Turner room at the National Gallery. They are all upon the same subject, a distorted and imaginary lime-light Venice, Venetian nightmares, as like to one another as the two halves of a melon, and as surcharged with over-ripe color. Amazing "fakes" they are, made up of a few scene-painter properties, — the Ducal Palace, the domes of San Marco, the columns and the Campanile, a few score gaudy gondolas — we all know how gaudy they are in fact! — and some ducal barges, with a yard-strip of Turner sky at top and as much of Turner water at bottom.

A lot of pictures are achieved by mixing these ingredients in different proportions: Ducal Palace to the right, Ducal Palace to the left, Ducal Palace in the middle, and you have three for example. And what of cleverness there is in all this strikes one with a sense of pity that it has been so wasted. The feeling deepens before a large canvas bearing the same signature as those Turner-esque aberrations. But here is a cool, strong breath of Nature, a great green and spuming billow in mid-ocean, swelling before a white squall, which drives down the horizon. This is the work of a strong brush with brains behind it, and Mr. Lucien Powell is to be congratulated upon the result.

For forceful, broad work in portrait-painting three large canvases by Harold Macdonald are especially distinguished. His portrait of Secretary Gage is, perhaps, the most finished of them, and in this work it is said that Carolus Duran, when he was here, recognized a strength which is shared, perhaps, by none of Mr. Macdonald's competitors in Washington. And it may be admitted that Carolus knows strength when he sees it, though he has sometimes frittered away his own in later days on achievements scarcely worth his while.

On the opposite side of the gallery is a panel of Mr. Le Grand Johnston's sheep in landscape. The arrangement followed of grouping each artist's work as much as possible together is a good one. Mr. Johnston is an artist in much of the true sense of the word, but

he seems to have painted too many repetitions of one subject. There is very charming color and rendering in a small landscape of his — without sheep — which bespeaks a high refinement of selection and an accomplished technic. His cattle are, perhaps, too strongly reminiscent of Troyon and Van Marck, as is a sheep picture by R. U. Brooke, in an adjoining room, too apparently a Mauve. Where Brooke painted himself into landscape, honestly and well, is in a small, quiet piece from the collection of Mr. Thomas E. Waggaman, which hangs below in the Hemicycle. It is merely a dun strip of wheat-land, with sheaves, under the fold of a low hill, but it might rank him with the masters.

Helmick tells an Irish story, in gouache, as easily as Seamus McManus, and with as rich a brogue to it: an old piper against the roadside wall and a pair of lasses footing it fast to the drone and skirl of the bagpipes have great life and movement. Next beyond are some English scenes in water-color by Walter Paris, and among these one is held before a small drawing of the rolling back of the downs under a fleecy sky, the greens cool and gray, and the whole landscape full of that dewy freshness which glorifies nature in England. Mr. Paris's good drawing of architectural subjects distinguishes several of the examples he has contributed to this show.

There was sold at the last water-color exhibition in Philadelphia a snow picture, "The Blizzard," by Mr. Paris, as bold and stirring a bit of rapid impression as one is likely to see. With this power in him it is curious to see the old dry English touch in much of his work, and he mars a good drawing, not seldom, by introducing stiff, unnecessary figures in his foregrounds, which are otherwise frequently overworked.

There is a good feeling of nature in E. H. Miller's "Purple Asters" at the edge of the wood, which, however, gains nothing from the interpolation of a couple of yellow butterflies hovering about them, seemingly a trifle out of scale. There is a very seizing bit of Mexican scenery, of plain and mountain, by W. H. Holmes, done, I am told, from a railway train. As to that, why not, if the train were stationary long enough? Among a number of other interesting things by this accomplished aquarellist there is a small drawing of purple-tinged magnolias in a little Japanese jar, in whose truth and decision of rendering there is much of the virtuosity which is his especial gift. He shows, too, some fine transcripts of sea and sky. Mr. Holmes has mastered the secrets of settling color, of the running-in of tones and the paper's values. In an Alma-Tadema arrangement of a draped maiden on a marble seat Mr. Holmes is not seen at his best: the piece might have been omitted to the advantage of the impression his panel leaves.

In the work of Mr. Guthertz we have to do with effort upon a high plane of art, mural decorative painting on serious idealistic and measurably religious themes. He seems to have sought inspiration in the early Italian masters to direct his work toward refinement of color and composition; he has evidently felt the harmony of Filippo Lippi's dreams of Paradise, and has, perhaps, tried to catch the immaterial purity of Angelico's monkish art. The gold which he uses liberally on his canvases, and sometimes in relief and plastically worked into rich decorative motives in halos and on robes, reminds one of the illuminist handling of the Blessed Brother of Florence.

One sets down these great names with reverence, as of those who have touched a sublimized representation of religious ideas in painting which, possibly, is never again to be realized. One would bracket no modern names with theirs. And, indeed, after all, there is more suggestion of Tiepolo, and of his blonde *pâte* and *chic* celestials, or, to come farther down the scale of time, of Rolle. Still, one must repeat, there is a strong decorative sense in Mr. Guthertz's "Light of the Incarnation," which, although actually a large easel picture, should be considered practically as a piece of mural decorative painting. The conception is interesting: fleecy clouds, in a heaven of vast illimitable perspective, resolve themselves, as one looks, into choirs of winged angels, into chains of roses. In the foreground are casual amorette; a Tiepolo touch here. The regard of the heavenly myriads turns to the East, to the light from the Stable of Bethlehem beneath the Star, whose rays are reaching into the furthestmost profundities of the cloud-world with the rosy tinge of the birth of Hope. Behind in the blue gloom of night loom the hills of the Holy Land.

In the "Arcessita ab Angelis," which seems to take the popular fancy, there is delicacy of coloring, but, perhaps, an overcrowding of decorated surfaces, a certain sumptuousness of detail and a prettiness in the faces and in the plump pink cupidons who intrude here, which go to lessen the solemnity of the picture and to make a certain impression of triviality.

Suzanne Guthertz, presumably the daughter of the artist of the works above described, shows some roses of good rendering, but one finds, perhaps, more of the freshness of the rose in life in a vase of those flowers signed by Aline Solomons. One is interested in a little Japanese interior study by Miss Guthertz. There is other work here signed with women's names which would, doubtless, deserve mention in a full notice of the exhibit, which these notes by no means profess to give. There is a head in pastel, by Miss Menden, which is in the right way. Other things of hers beside it, however, would suggest that she does not, as yet, hold perfect command of her talent.

Helen Nicolay's drawings in water-color indicate a true and refined feeling for landscape and for color, interpreted by a rendering which yet needs breadth and force.

Miss Perrie's "Ship at Wharf" does not indicate very full realization of the promise of her earlier work, if, indeed, the piece is not in fact, as seems likely, a performance of some years back.

Among Juliet Thompson's exhibits is one apparently well-painted bit, a boy's head, among some ambitious, overdone, large portraits in pastel.

In Mr. Moser's landscapes one feels a rather too insistent striving for effect. He seems not to know Nature in her sweeter and more serious moods. His instrument is keyed too high, and his music lacks depth and sincerity of undertone. He should let his "G" string, if he has one, be heard.

In the Hemicycle, a large and handsome semicircular room on the first floor of the gallery, are assembled some of the more important pictures of the exhibit. They show to much better advantage than in the upper gallery, where one can with difficulty get the right distance from the larger pieces. Here are some important portraits by Mr. Hinckley, of which two, a boy and a girl, are characterized by solid painting and full tone, but the faces are somewhat lacking in expression and the flesh is dull and lifeless. On the opposite end of the semicircle are a number of canvases by Max Weyl, who devotes himself exclusively to landscape, which he renders with force with full fresh color, somewhat after the methods of Daubigny and of Diaz, we will say, and with a certain grace and feeling. One regrets that there is no example here of Mr. Messer's thoughtful and poetic treatment of landscape. In passing, one should note in a side room, not a part of the present exhibition, a portrait of Mr. Messer by Jerome Uhl, a very serious, dignified and delightful piece of portraiture.

A very clever painter of portraits, also, is Mr. Floyd, whose group near the centre of the Hemicycle has much of interest. There is one canvas, the head of a lady with silvered hair, which is rendered with breadth and power. A three-quarter length of a young woman shows good color and drawing. Mr. Floyd's work has quality and gives promise. It would be bettered by the possession, in a greater degree than yet attained, of a quality which strongly distinguishes the work of his neighbor on these walls, Troubetzkoy. Rightfully in the place of honor, in the centre of the Hemicycle wall, hang a number of very charming portraits by Prince Pierre Troubetzkoy. To dub him *facile princeps* of this exhibition might seem a triviality, and would indicate a preëminence far below that of his deserts. Stationing one's self in the centre of the Hemicycle floor, and glancing from panel to panel of the work upon its walls, the eye comes back to Troubetzkoy with a realization of the quality which is his, far above the rest of them, the subtle gift of tonality. The chief charm of his work is that his tones all sing in tune, and mingle in harmonies soft and delicious to the eye. His color is fresh and clear, and on a nearer view his touch is broad and full of style. His arrangements mostly escape the commonplace, and character is indicated with sufficient reserve. In the three-quarter sketch of a handsome boy in white leaning against the rail of a yacht, the wind stirring his uncovered curls, a suggestion of following wave and breezy sky behind him, and in the standing figure of a girl in soft white gown and pearls, there are qualities of a high order.

The exhibition, as a whole, lacks evidence of sufficient selection and elimination. Here and there the general impression is of an effort to cover the walls at any risk. By hurrying in too many things some exhibitors have convicted themselves of a surprising inequality of workmanship; others, by many repetitions of the same motive, of a lack of versatility. There is a large line of foreign views, for instance, some fifty or more, in a bleak formula of color, any twain of which are alike as two peas.

Some artists do not, apparently, know their good things from their bad ones, and have sent both kinds to make sure. As to the hanging jury in this case, if there were any, it must be accredited with more than usual kindness of heart. The objective idea seems to have been to cover a great amount of wall-space. The result is a low average of excellence. A judicious weeding-out of mediocre work would have permitted better hanging of the good material. The resultant uncovered spaces of quiet burlaps would have been restful and agreeable.

A. B. BIBB.

CONCRETE FLOORS.¹—I.

IT was about twenty-two years ago, when I was enjoying my summer holiday in the Isle of Wight, that I was recalled by wire to Sunderland by my friends, Messrs. Pearman & Corder, wholesale grocers and provision merchants, to assist them in settling with the insurance company for the total loss by fire of their large warehouses in the middle of Sunderland. It was a very awful fire, and one which might have had terrible consequences upon the surrounding buildings in that crowded locality, and my clients were impressed with the necessity of making their new buildings fireproof if possible. I had had no previous experience of fireproof construction, and upon approaching the problem I found a serious difficulty, which was, that it would not be possible, with the financial means at our disposal, to erect new buildings by any of the expensive methods of fireproof construction which were then in vogue. The necessities of the case induced me to give an amount of earnest thought to the question of the strength of concrete slabs. It was an extremely

difficult subject to grapple with, because, though I searched in many directions, I found no authoritative data to guide me. The most valuable book which I at that time studied was Grant's book on "Cements." But this book gave me no indication as to what size of slab I could safely adopt, and I therefore had to think the matter out for myself.

Now, it was plain to me from the very beginning that, apart from the question of cost, the introduction into concrete floors of large masses of iron girders—there were no steel girders in those days, but the same remark applies to steel—is in itself calculated to impair the fireproofness, because iron is a material which expands under heat to such a degree as to tend, during a fire, to destroy the floors which it would be intended to strengthen. I therefore determined on this account, but also with a view to economy, to do with as little iron as possible. At this time I began to think about the differences of strength between a slab resting upon its two ends like a beam, or on its four edges, and I was able at once to discover in this difference a principle which, if rightly applied, might prove of inestimable value in solving the practical problem with which I was confronted. I took from my mantleself a little framed *carte-de-visite*, and, removing the glass and the card, I placed the frame flat upon the table and laid the card crosswise over it, resting on its two ends like a beam. Upon the middle of the card I piled a few coins as a load, and increased the pile until the card bent down and touched the table. I then tested the strength of this same card as a slab, by simply placing it back upon the ledge of its frame, so that all its four edges were supported. Again I loaded the middle of the card with coins, the same number as before, without making any visible deflection; and I found that I had to increase the load very greatly to induce the card to bend so far as to touch the table; and indeed, in doing so, it became necessary to seriously buckle and injure the card in a way that the mere bending of the first experiment did not. I then began to think of trying similar experiments with glass, because it struck me that glass, being of a hard, brittle nature, was more akin in this respect to concrete; but, upon reflection, it occurred to me that I need not make any actual experiments with glass, for every window-pane subject to a strong wind-pressure was mechanically in the condition of a floor-slab resting on its four edges. Then I remembered also the glass-counters of tobacconists' shops, how very strong they seemed to be; and last, but not least, I thought of the huge plates of plate-glass in our modern shop-windows, and of the great amount of wind-pressure which they proved capable of resisting.

Of course, I saw that glass as a material is much stronger than the best cement-concrete, and on looking into tables of the strength of materials, it seemed that glass might be taken as about five times stronger than concrete. Taking a plate of shop-window glass 10 feet square, under a wind-pressure of 20 pounds per square foot, we have a slab of 100 square feet carrying a distributed load of 2,000 pounds. A slab of concrete 10 feet square would, of course, be much thicker than the glass. Say the glass is $\frac{1}{4}$ -inch thick, and a slab of concrete is 4 inches thick, we know that the strength will vary as the square of the thickness. Now, 4 inches is sixteen times thicker than $\frac{1}{4}$ -inch, and 16 squared is 256, so that if the concrete were as strong as glass, it would carry 256 times 2,000 pounds load. But on account of the concrete being only one-fifth of the strength of the glass, you must divide 256 by 5. Thus we reach the conclusion that a concrete slab 4 inches thick will carry 51 times the load, say 50 times in round numbers, of a glass-plate of the same size but only $\frac{1}{4}$ -inch thick. According to this computation, our concrete slab 10 feet square and 4 inches thick will carry 100,000 pounds; that is, 1,000 pounds per square foot of surface equally distributed, or say about nine cwt. per square foot, including its own weight. Upon this mode of reasoning I proceeded to make sundry experiments, and also collected from many sources such data in regard to the proved strength of concrete bridges and floors as tended to confirm the principle of comparison, and eventually I proceeded with the floors of Messrs. Pearman & Corder's new warehouse, and constructed about one thousand eight hundred tons of concrete-flooring in large slabs about thirteen inches thick, many of which were about twenty-one feet long by about twelve and one-half feet wide, without any iron in them. When the work was far advanced, and before the centrings were removed, Mr. Pearman remarked to me that many practical people thought that both he and I were mad, and it was generally expected that when the centring was taken away the slabs would fall by their own weight. These evil predictions, however, were falsified, and during the last twenty years these floors have been in constant use, subjected not only to heavy loads, sometimes amounting to 5 cwt. upon the square foot, but also to the impact of falling weights, and to the rough-and-tumble work of a heavy goods warehouse, as well as to the vibration—which is very trifling—of a powerful Otto gas-engine on the upper floor, four stories above the ground. Several fires have occurred in this building since it was completed, and in each case the damage done was very insignificant; although, had the building been of the ordinary non-fireproof character, it would have been probably wholly or partially destroyed.

I need hardly tell you that I was gravely impressed during the carrying out of this work with the heavy responsibility involved in the adoption of concrete slabs of such large sizes without iron, and I should not have felt justified in assuming that responsibility had not the financial necessities of the problem demanded it. These floors were constructed at a cost far below what would have been the cost had I followed the method of construction at that time most

¹A paper read before the Northern Architectural Association at Newcastle, February 14, 1900, by Frank Caws (F.) Vice-President of the Association, and printed in the *Journal of the Royal Institute of British Architects*.

approved of; and I believe these floors are more fireproof than they would have been had I introduced a considerable quantity of iron.

In committing myself to this grave undertaking, I attached due importance to the time element.

In these days of hurry, both clients and contractors are always too ready to remove the centring before the concrete has properly set, but I was exceedingly careful to prevent any centring being struck within five weeks of the slab being cast, and in most cases the time allowed was considerably more than five weeks.

In this building the walls were carried up to their full height before any floors were cast. The top floor, which was the roof-flat, was cast first, and when it was set the same centring was used for the lower floors, one after the other, which, while economizing the cost of centring, of course added to the slowness of the progress. This is a method which I would never adopt of choice, as I consider it subjects the work to serious disadvantages. I greatly prefer to cast the floors upon the walls as the building rises, and to use a separate centring for every floor, and in many of my subsequent works I have adopted this method, but one cannot always do as one likes in such matters. At Pearman & Corder's buildings we obtained the necessary rests for the slabs upon the walls by building courses of brick in sand at the floor edges, which courses could be easily removed in short sections as fast as the concrete was ready to take their places. That is a method which is perfectly safe, like underpinning, if carefully executed, and though I have never experienced any ill effects from it, there is always the "if," which should, if possible, be avoided.

Perhaps, before proceeding further, I ought to describe the nature of the concrete used on this occasion. It consisted of one part of Portland-cement, manufactured by Messrs. Grimshaw, of Hylton, and four parts of good hard broken brick, turned over twice dry and twice wet, using the water as sparingly as possible. I am an advocate of broken brick as the best aggregate for concrete for such floors, because, having passed through fire, brick is already fireproof, differing in that respect from broken stone or gravel. I have also found that broken brick is a substance of approximately equal strength to Portland-cement, which is proved by the fact that when such concrete is broken up, the fracture extends alike through both the brick and cement, but when hard flint gravel is used instead of brick, the fractures leave the individual pieces of gravel intact, while the broken concrete has the appearance of cement-gums, so to speak, from which the gravel teeth have been withdrawn. This is particularly true when the gravel used is of a smooth and rounded kind; moreover, the hard, smooth gravel surface has no suction for the cement like the porous surface of broken brick. I am aware that various kinds of breeze are often used as aggregate in concrete floors, it being argued that this material makes the concrete much lighter; but I should hesitate to construct large slabs with breeze aggregate, as I do not think it would be equal in strength to concrete with broken-brick aggregate, and as to the weight of the latter I consider it no drawback to a properly constructed building with good and sufficient foundations. Breeze aggregate may, however, be usefully employed for any parts of the floor or ceiling into which it is desired to drive nails. But my practice has been to embed breeze bricks in the concrete for such a purpose in the proper position where required for nailing.

I have particularly mentioned Pearman & Corder's building, not because it is the best or boldest example of slab floors which have been constructed under my care, but because it was the first.

Subsequently I have been engaged on many concrete floors, in all of which I have adopted the slab principle successfully, varying the mode of construction in sundry details which the special requirements of each case and further experience suggested. I have always been particular to obtain rigid, strong centring, and I cannot too emphatically caution my fellow-architects as to the importance of this item. Any attempt to save money by scamping the centring is likely to lead to trouble and prove very false economy.

The greatest difficulty in dealing with cement-concrete floors is due to the natural expansion which the material undergoes in process of setting. This expansion is much greater when the cement is new and hot than when it is old and cool. It is not, however, the expansion itself which causes the trouble, so much as the smaller degree of contraction which follows expansion in the process of setting. This contraction causes cracks, which frequently occur over the supporting girders, where the concrete is generally thinnest. These cracks have really no appreciable effect upon the strength of the concrete, but all the same they are apt to cause uneasiness and want of confidence in the minds of those who do not understand what they are occasioned by. By using carefully selected cool cement, and by taking certain precautions as regards the size of the slab and its mode of casting, the shrinkage can be so minimised as to almost entirely avoid such cracks.

I would like to point out at this stage that I consider sand a most improper material to mix with cement in concrete-floors; in fact, I regard it as poison to the cement, and have never allowed its use since the discovery I made at an early stage of my experience as to its bad effects.

The fact is, if a very fine sand be used, instead of helping the cohesion of the concrete, it tends to disintegrate it, so that, when sand is employed to give the necessary smoothness to the finishing of the upper surface of the cement-concrete floor, the surface, when subjected to the traffic, is likely to scrape off, and give off sandy dust, and eventually present a very shabby appearance; therefore, I

have found it best to employ, in finishing the surface, fine crushed granite instead of sand.

Of course the surface of the slab should always be put upon it while the body of the casting is still comparatively wet, but it is hardly practicable to put the surface on in one and the same heat with the casting of the slab. In fact, it generally has to be done as a separate operation, and though it is desirable to have it done on the very next day after the slab has been cast, it is not always possible even to secure that arrangement; and it ought not to be overlooked that, whether the surface be put on immediately after the casting or some time later, the surface—which should generally be about an inch thick—can never be made absolutely homogeneous with the under bed. For once the latter is allowed only a few hours to set, the film of air resting upon it is never entirely expelled by any layer afterwards superimposed, and this air-film constitutes a real division between the under bed and the surface. Therefore, in reckoning the strength of concrete slabs the architect should not rely upon the entire thickness, but only upon the thickness of the under bed; so that, for example, in a slab whose total thickness is seven inches, including a one-inch top coat, the architect should consider the effective thickness, as regards strength, as six inches only.

One of the most remarkable features about cement-concrete floors is the great density of the concrete at its under surface, due to the fact that the liquid cement naturally gravitates to the lowest level, leaving the grosser aggregate above it, so that the wood-centring when removed leaves upon the ceiling an exact impression of every plank, such that the grain of the wood is distinctly traceable upon the under surface of the concrete slab, the extreme hardness of which makes it difficult for an ordinary plaster ceiling to be rendered beneath it without running the risk of the plaster falling down, as the hard cement surface has little or no suction to afford the plaster a key, or hold.

There are various methods of overcoming this difficulty, all of them more or less costly. In one of my most expensive buildings I determined to do without the plaster ceiling, and to obtain a perfectly smooth surface to the under-side of the concrete-floors by which the plaster would be rendered unnecessary. Accordingly, I set the plasterer to work to cover all the wood centring with a skin of plaster, floating it very true and smooth, and so instead of casting the concrete upon bare boards in this instance, I had it cast upon a prepared plaster matrix. When the centring was taken down the plaster came away with it and left the cement surface as perfectly level and smooth as could be desired; but, alas! the color of the material being dull, mottled and unpleasant, and having none of the light-giving quality of the white plaster ceiling, we had no alternative but to paint or paper these cement ceilings.

Another method which I have tried more recently and very successfully in plastering under concrete slabs is to render them, after the centring is taken down, with a coat of Portland-cement and sand, which I find adheres well, and upon this coat I finish with a skimming coat of fine plaster.

In making fireproof floors for cottages I consider if proper care were taken in the centring, and the joints therein covered with narrow strips of lining paper (to prevent the cement grout from descending into the chinks), it would be better to do without plaster ceilings altogether, and be content with the natural impression of the wood upon the cement, whitewashed. By such means, and also by avoiding needlessly-thick slabs, the expense of cement-concrete floors can be brought within such limits as to render the fireproof dwelling of a workman cheap enough to be a good commercial investment.

[To be concluded.]



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

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CHOIR-STALLS IN THE CHURCH OF ST. BERTRAND DE COMMINGES,
FRANCE.

DETAILS OF THE SAME.

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[The following named illustration may be found by refer-
ence to our advertising pages.]

DESIGN FOR A COTTAGE BY MR. ROBERT BROWN, ARCHITECT,
BOSTON, MASS.

"Lord, thou has given me a cell,
Wherein to dwell,
A little house, whose humble roof
Is weatherproof;
Under the sparres of which I lie
Both soft, and drie:" — HERRICK.

THIS cottage is of a different type from those ordinarily built for
the "cottagers" at Newport, R. I. Such a plan as this in
England would be considered suitable for the gate-lodge to some
large estate, the house of a small farmer, or a foreman artisan.

When a man of moderate means, in these days, sets out to build
himself a home, he is liable to enlarge too much. Instead of trying
how little he can get along with, how few rooms he can have, he is
too often led away by conventionalities from the simple practical
requirements of his position. To such a person, the plan here given
would be quite unsuitable.

The housewife will see from the plan of this cottage that the
keeping it in order would entail very little labor.

There is provision made for a hall stove, the recess in which it
stands being lined with bricks or tile. A furnace-fire in the base-
ment would not be required, except perhaps in very cold weather.
The dining-table stands in an alcove, where it can be easily served,
and at times screened from view by a curtain.

The opening off the kitchen — the scullery — is an English feature,
a place where all the dish-washing would be done, keeping the
kitchen-proper clear and clean.

The bedroom over kitchen has a small open fireplace, and the bed
is in an alcove. The closets in all the bedrooms would take the
form of built-in wardrobes, thus saving much space. In addition to
these, there are three window-box seats, with hinged lids, giving
space for bestowal of clothing, etc.

Above is a large loft (with access by a step-ladder) lighted from
the gable end. This could easily be used as a studio by having a
roof-light on the north side.

The outer walls of the cottage would be built of red brick, prefer-
ably the hard-burnt uneven clinkers that are ordinarily rejected.
In this way a wall, little affected by dampness, would be built and
the roughness would be no detriment to the effect. The timber
used externally (cypress perhaps) which is treated architecturally as
timber might be stained (not painted) a dark brown; the plaster-
work tinted cream or yellow color. The sashes throughout are case-
ments, the glass being ordinary window-glass in heavy leads. The
ceiling-joists of the ground-floor show in the several rooms: the roof-
rafters would be liberally covered with sheathing-paper, or filled-in
with some noncombustible material under the shingles to keep out
heat in summer and conserve the interior warmth in winter.

No estimate on the cost of such a cottage has been made, but it
should, in this respect, compare favorably with many a more ornate
design.



RECENT DISCOVERIES IN CRETE. — The excavations carried out by Mr.
Arthur Evans and Mr. D. G. Hogarth in Crete continue to yield results
of the highest interest. On that portion of the site of ancient Knossos
which Mr. Evans has selected for investigation (Kephála) a Mycenaean
palace has been discovered containing relics of extraordinary impor-
tance, by means of which the hitherto uncertain question of Mycenaean
writings has been finally settled. In the chambers of the buildings
have been found a whole series of clay tablets, analogous to the Baby-
lonian, but with indigenous Cretan script. These tablets are apparently
palace archives. On the south front of the building the entrance-hall
of the megaron has come to light, and in the adjoining corridor is a large
piece of fresco representing a full-sized figure of a girl in Mycenaean
costume holding a long vase. In brilliancy of coloring and grace of
form the figure surpasses anything hitherto discovered belonging to

this period. The remains belong to the great Mycenaean age, about
1400 B. C. — Athens (April 10) Correspondence London Times.

OIL-ENGINES. — The use of the oil-engine is increasing in Palestine,
and particularly for irrigating and pumping have these machines been
found economical and effective, as a six-horse-power oil-engine will
raise double the quantity of water in the same time that a horse or
mule would consume, while the cost of oil is about equal to that of
maintaining the mules. The owners of orange-gardens and the deep
wells are the chief users of these engines, and there is thought to be a
considerable market for such machinery in Palestine. — N. Y. Evening
Post.

PRESERVING OUR PREHISTORIC MONUMENTS. — The introduction of
two bills recently in the lower house of Congress, one by Mr. Shafroth,
of Colorado, and the other by Mr. Dolliver, of Iowa, for the preservation
of prehistoric monuments, temples, ruins, etc., and to segregate from
the public lands certain tracts on which are situated these ruins and
ancient houses, indicates that Congress has at last awakened to the im-
portance of preserving to the scientific world the evidences of pre-
historic man on this continent. The Casa Grande in Arizona, the
Chaco cañon in New Mexico, the Grand Quivira in the same territory,
and the Mancos cañon in southwestern Colorado will receive the im-
mediate attention of the Bureau of Ethnology on the passage of either
bill and the appropriation of the necessary money to provide custodians
and make needed repairs. Mrs. Virginia McClurg, of Colorado, by her
efforts has excited interest in and some protection for the Mancos
cañon and other prehistoric ruins in that State, and Arizona has en-
deavored to preserve and protect her aboriginal ruins, but the intention
has resulted disastrously for the ruins, as the acquisition by the Terri-
tory of the ruins from the Federal Government lost them that protec-
tion and preservation which the Territory neglects to provide by the
non-expenditure of the necessary funds to repair the ravages of decay,
such, for instance, as the very timely appropriation of \$25,000 by the
Federal Government to strengthen the walls of the Casa Grande. — San
Francisco Chronicle.

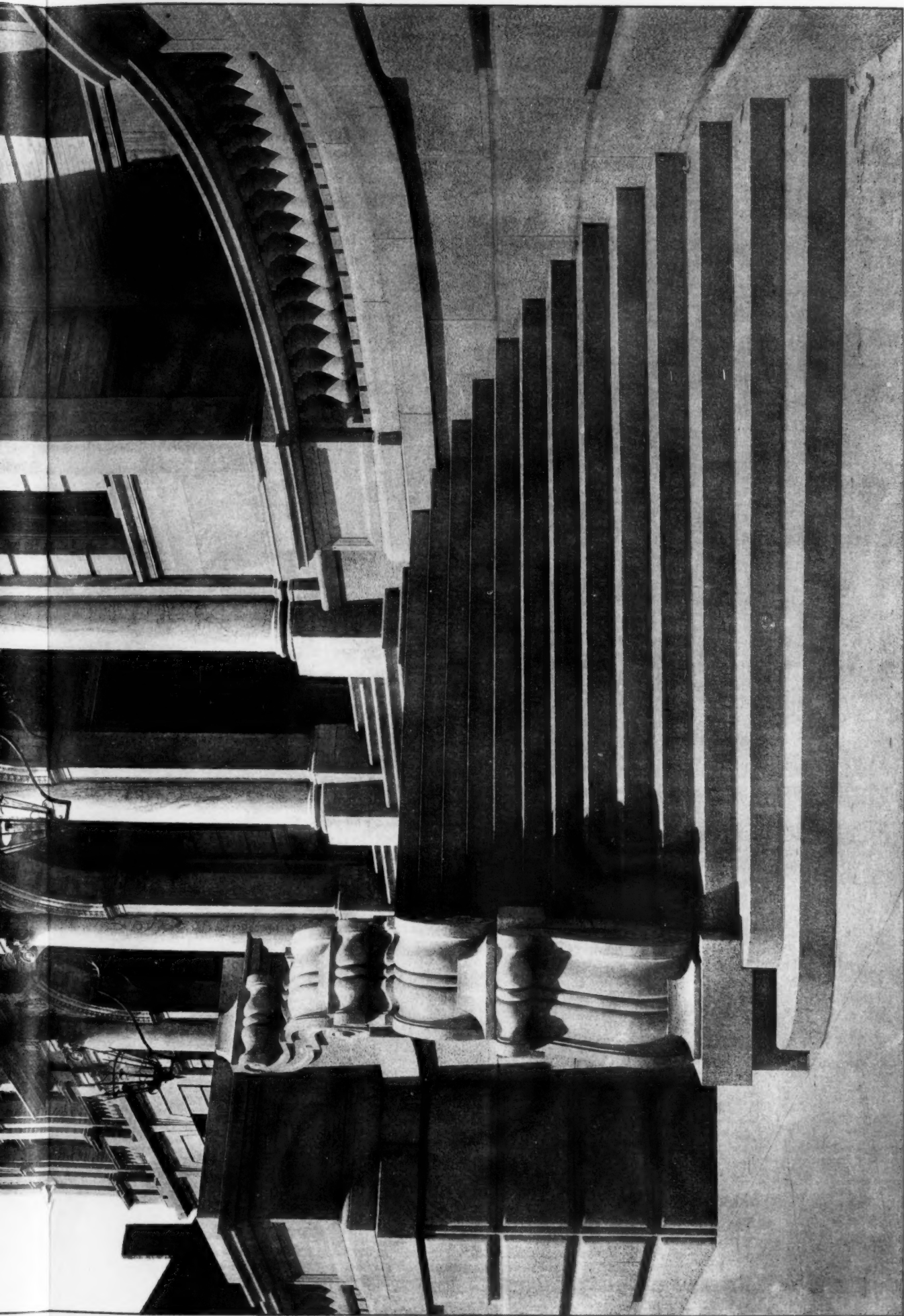
THE PROTECTIVE POWER OF PAINTS. — In a paper recently read
before the Newcastle section of the Society of Chemical Industry, Mr.
Harry Smith, F. I. C., describes a series of very interesting experiments
upon the comparative protective powers of different paints as applied
to ironwork. Three series of experiments were made. In the first
series a method originating with Mr. Max Toltze was employed. A
number of iron dishes, 5 inches across and about one-half inch deep,
were cleaned and carefully painted with two coats of the paint to be
tested. These dishes were then filled with water, which was allowed to
completely evaporate at the ordinary temperature of the laboratory,
after which the dish was again filled up, this operation being repeated
six times in the course of the six months over which the experiments
extended. The paints used were prepared by grinding the pigments
with linseed-oil on granite rollers to a stiff paste, which was then
thinned with best quality boiled linseed-oil — itself capable of drying in
seven hours to a hard film when painted on to a glass plate. Thus
tested, the only paints which remained practically unaffected were red-
lead or orange-lead paints, some of which, however, such as the "ver-
millionette" and the scarlet-red paints, contained also a certain pro-
portion of aniline colors; while two of the red-lead paints contained, in
the one case 45 per cent, and in the other 66 per cent, of barytes. All
the other dishes were more or less rusted, the order of merit of the
better paints being as follows: 1. Zinc-white. 2. Equal parts zinc-
white and barytes. 3. Zinc-white, 3 parts, barytes, 7 parts. 4. Litho-
pone (a mixture of zinc-sulphide, zinc-oxide, and barium-sulphate).
5. Pure white-lead. 6. White-lead, 5.37 parts, barytes, 4.03 parts. 7.
White-lead, 5.05 parts, barytes, 4.21 parts. All the other paints, 36 in
number, proved very inefficient, the first dish to show signs of rust
being that painted simply with linseed-oil. In the second series of ex-
periments a number of painted iron plates were exposed to the weather
for a twelvemonth, and with the single exception of the plate painted
simply with linseed-oil, all withstood the test remarkably well. In the
third series of tests, strips of iron were painted, and when the second
coat was quite dry these strips were placed in wide-mouthed glass
bottles, which were then nearly filled with water, and allowed to stand.
The bottles were not closed, but the contents were protected from dirt
by standing them under a shelf, there being about one-half inch of
space between the top of the bottles and the underside of this shelf.
The bottles were left untouched for three months. Some of the plates
were sensibly affected within seven days; but those which successfully
withstood the shallow-dish test also resisted this one most successfully.
The fact that paints containing such large proportions of barytes, as
some of the lead-paints noted above, gave such excellent results is of
much interest, as it goes to show that this material can hardly be con-
sidered as a mere adulterant. In fact, one paint made up only of
barytes and linseed-oil gave better results than an oxide-of-iron paint.
Mr. Smith refers with approval to the methods adopted in painting the
Forth Bridge. All plates and bars for that structure were cleaned with
steel scrapers and wire brushes, and then coated with hot linseed-oil.
As soon as possible after erection they received two coats of red-lead
paint, which were subsequently followed by two coats of iron-oxide.
The life of the paint on the upper portions exposed to the weather is
found to be about three years; but it must be added that the paint is
then still in good condition, and on less important bridges would by
many engineers be allowed to pass for several years longer. Experience
shows, however, that in such cases the metal is liable to be deeply
pitted. The paint inside the tubes of the Forth Bridge is as perfect as
when first applied, twelve years ago. The parts of the bridge most
subject to rust are near the water, where the underside of the girders
get sprayed with salt. The rusting commences on the rivet-heads and
the edges of the plates. These portions of the bridge are cleaned
and repainted every year. — Engineering.

AMERICAN ARCHITECT AND BUILDING NEWS, JUNE 9, 1900.

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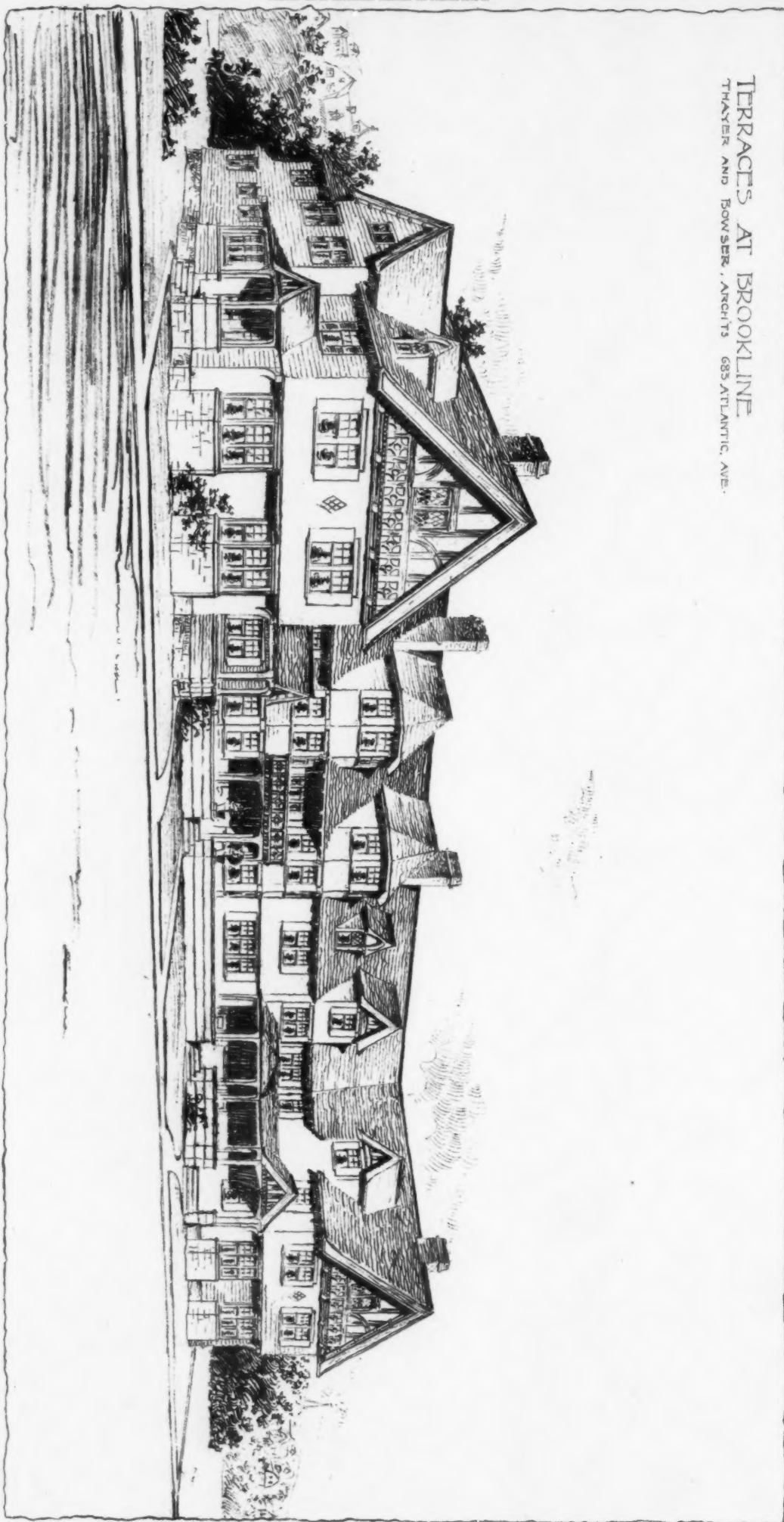
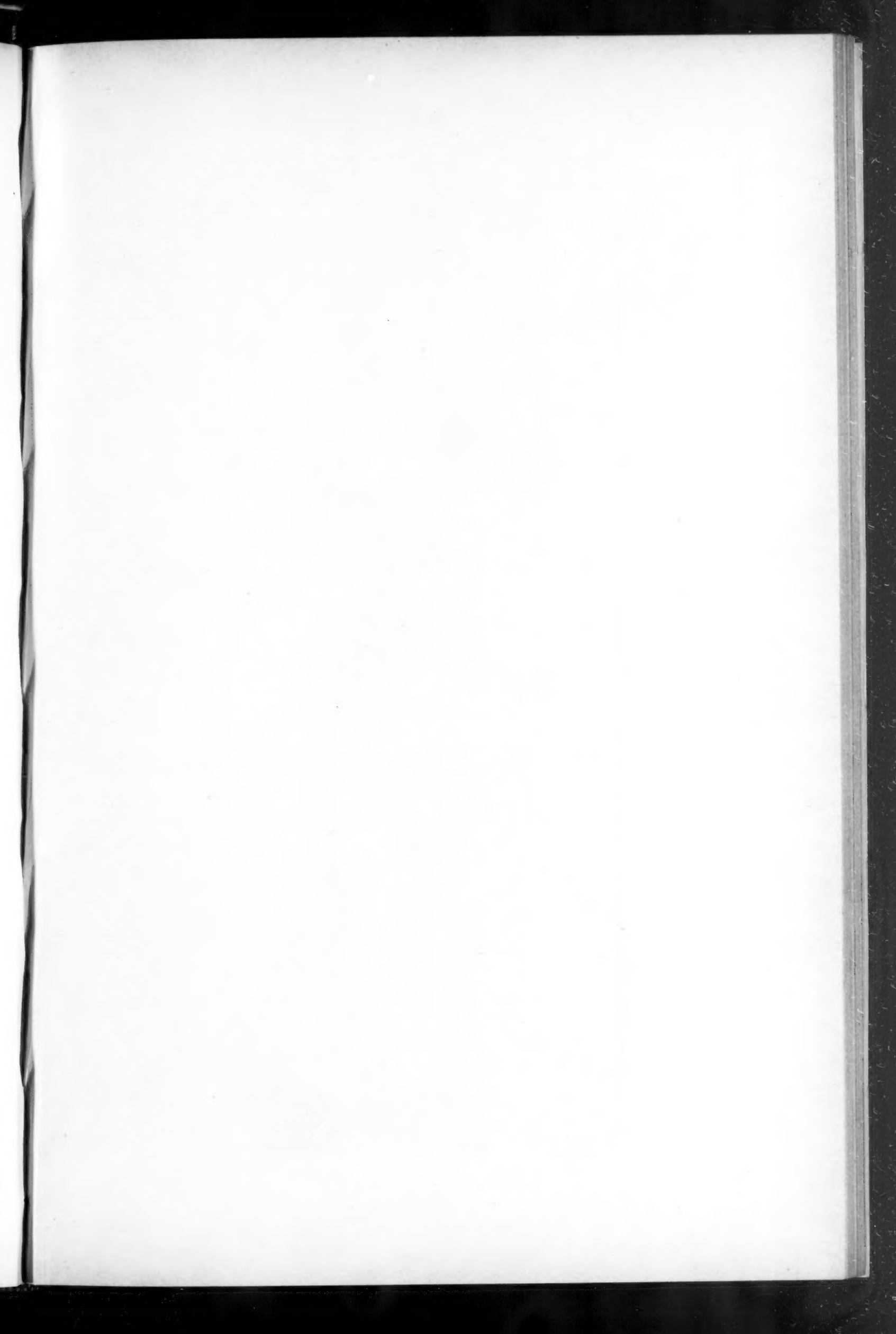
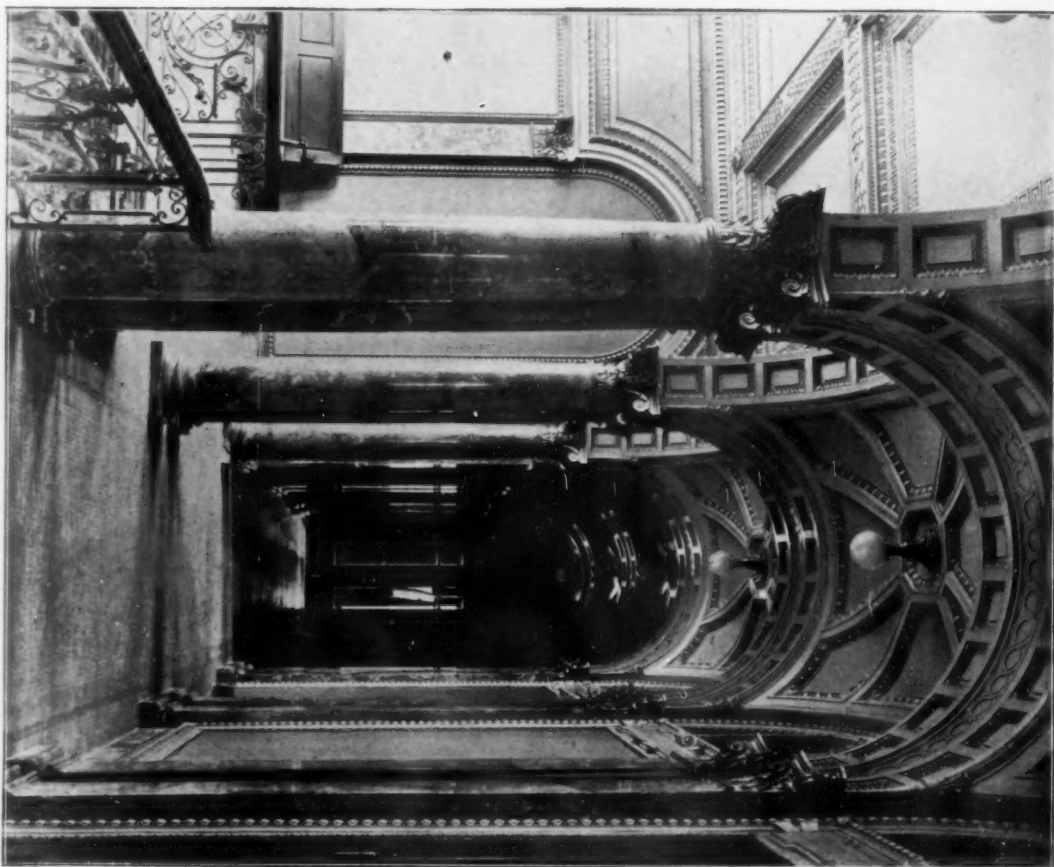
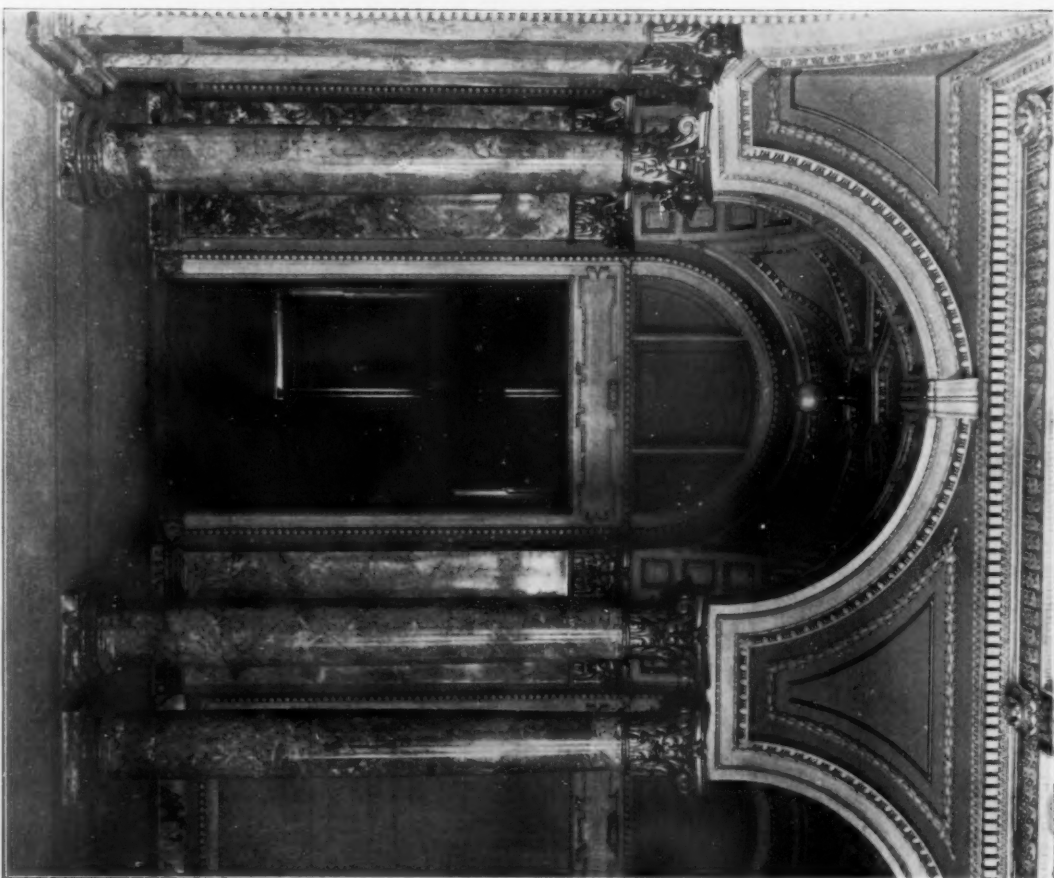


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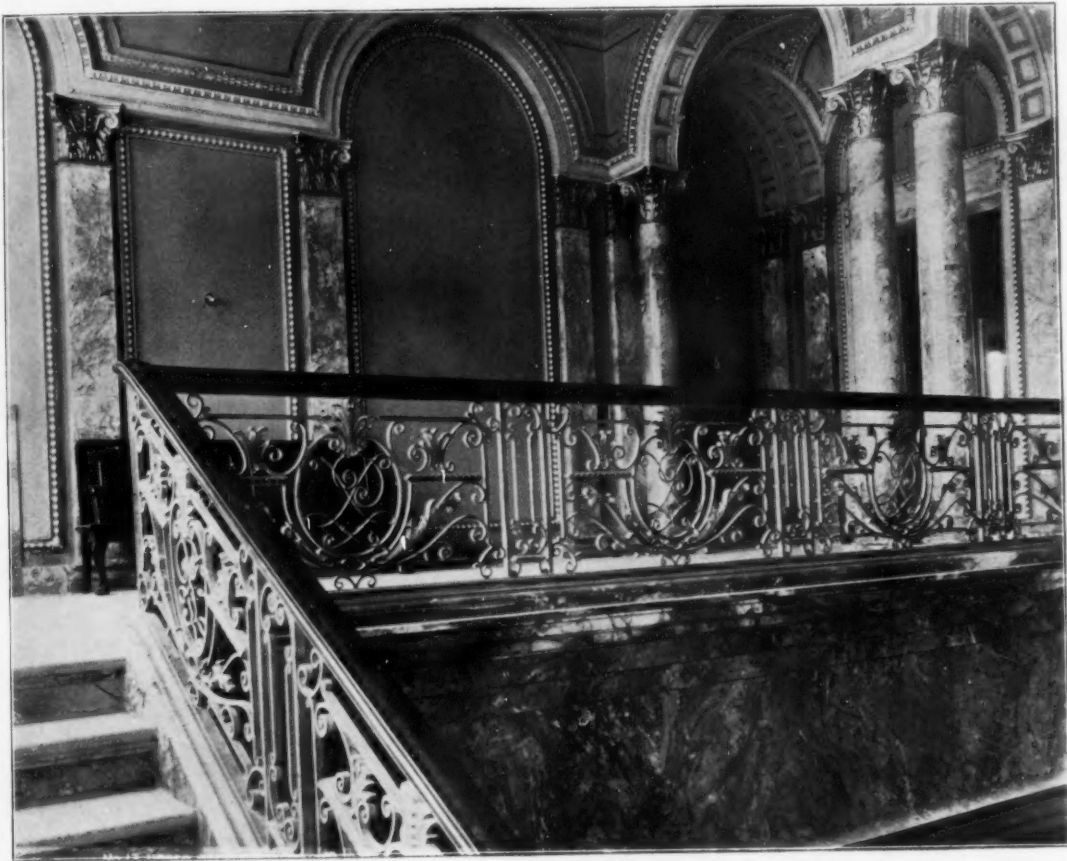


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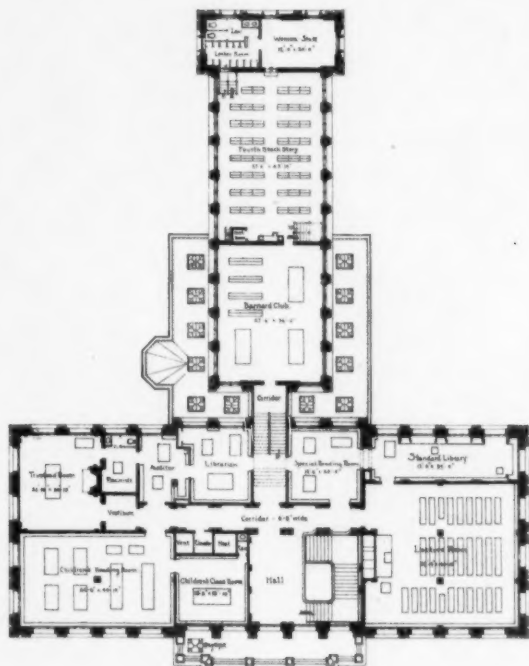


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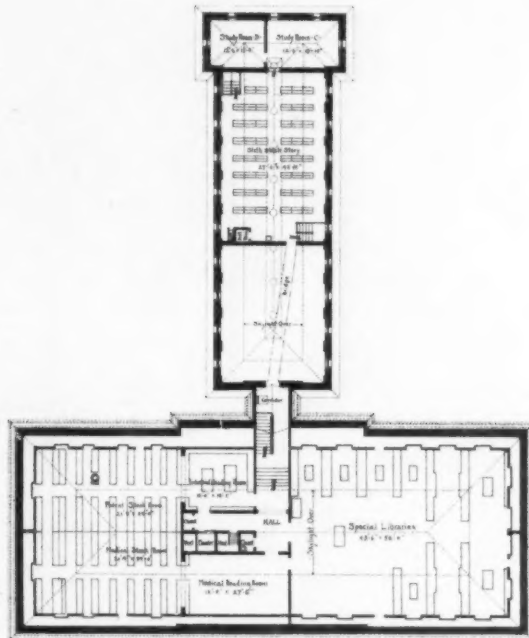


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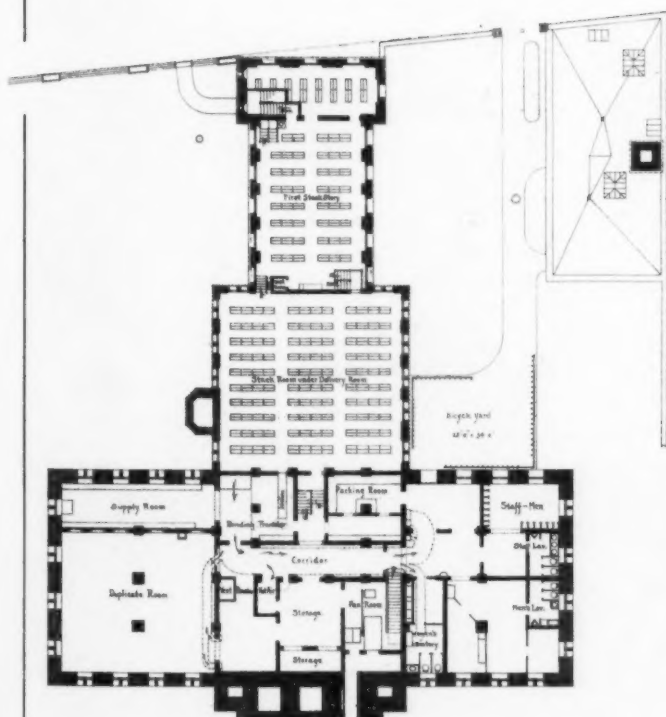
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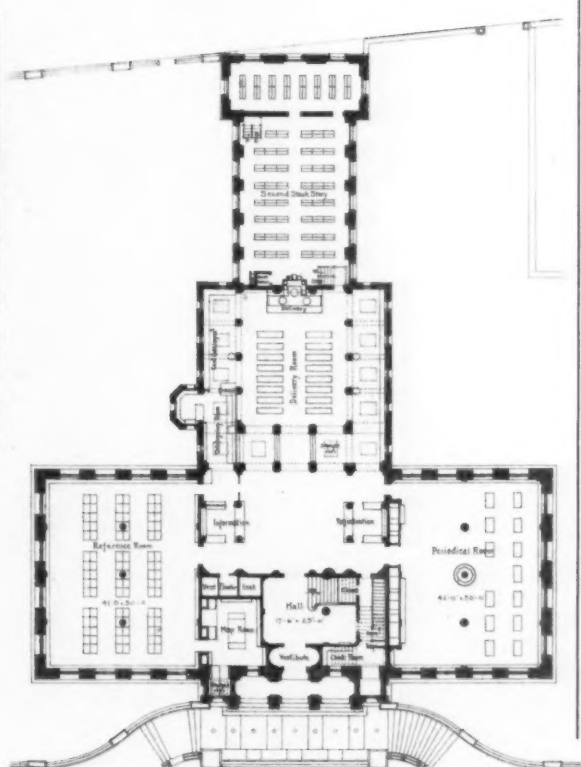
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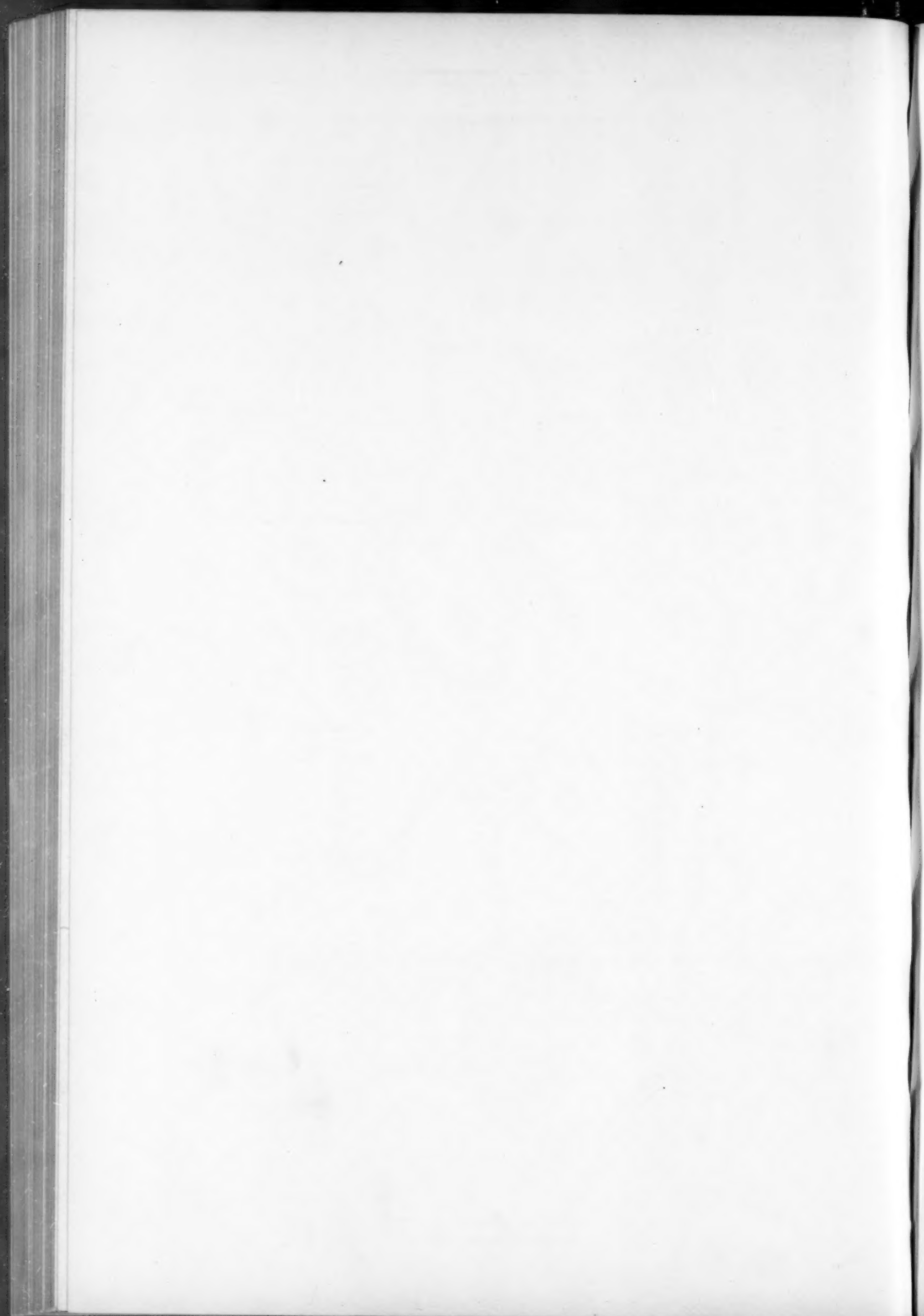
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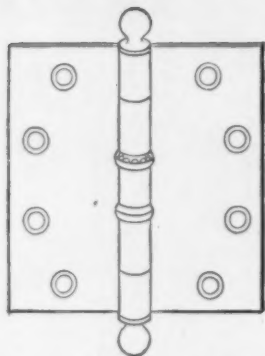
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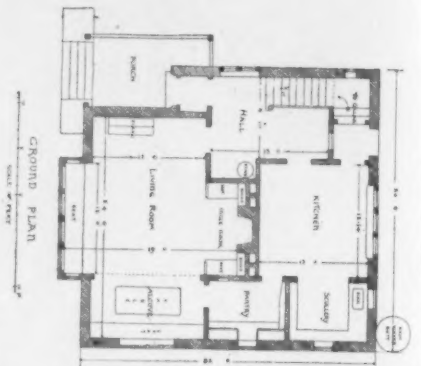
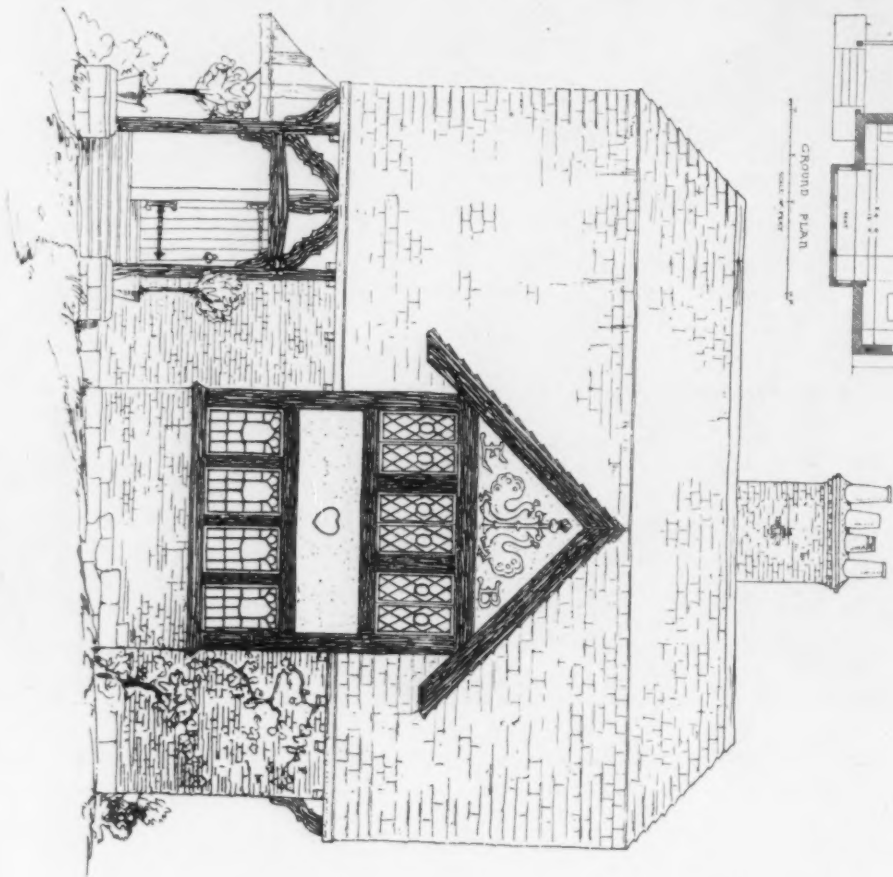
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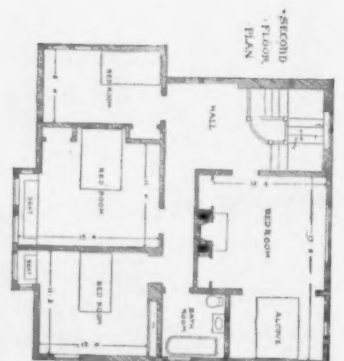
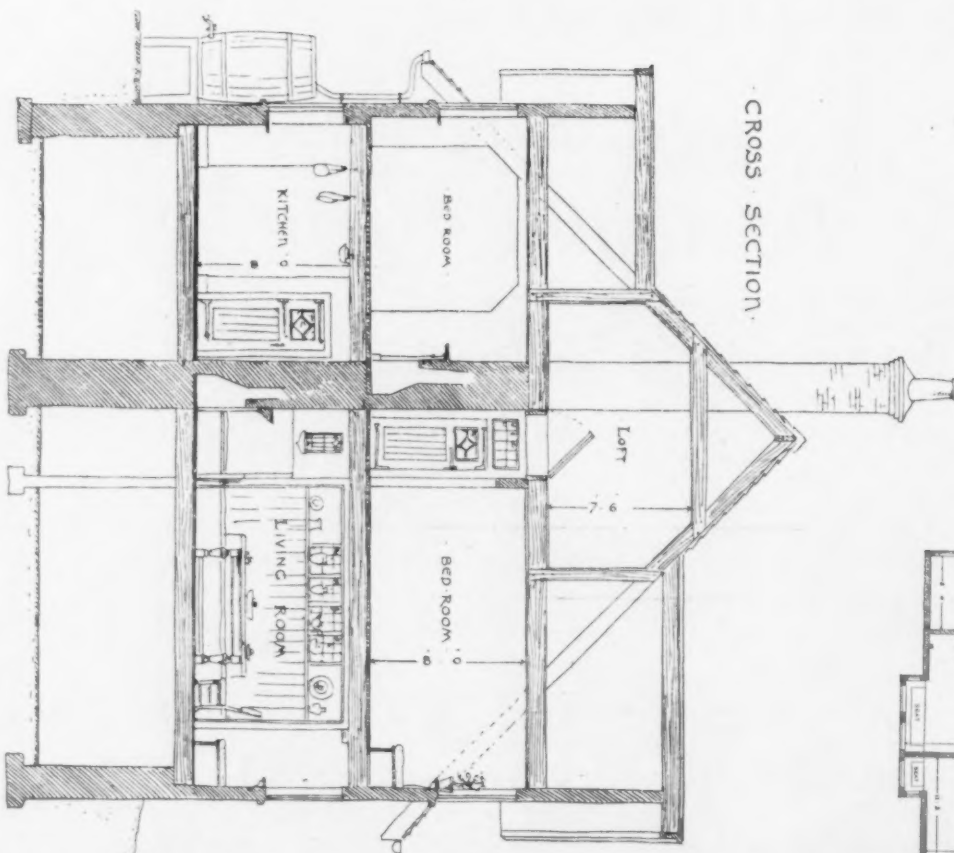
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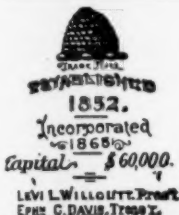
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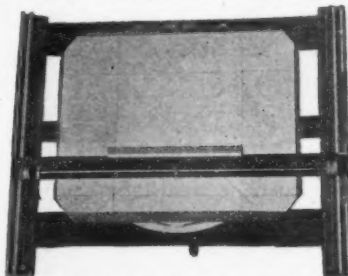


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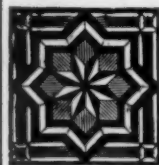
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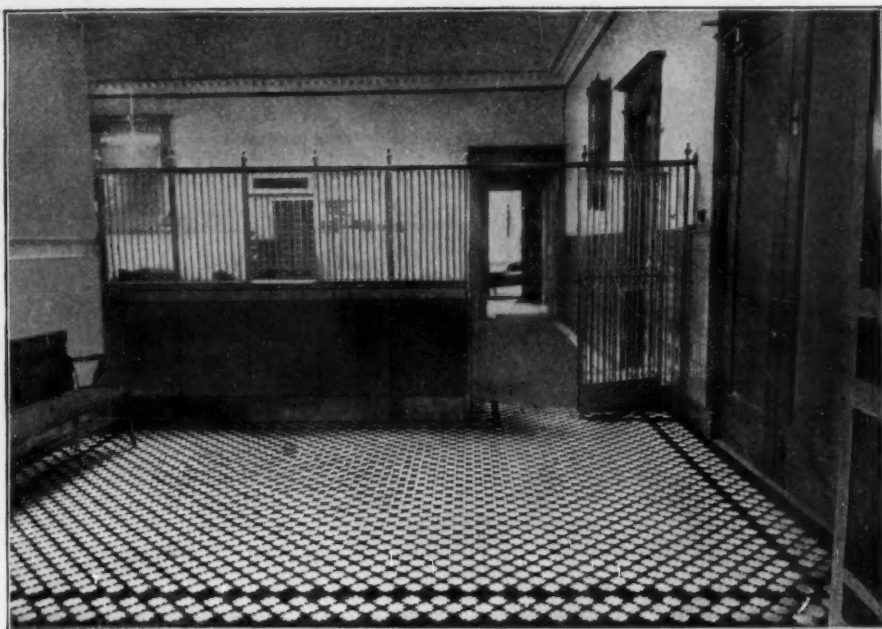
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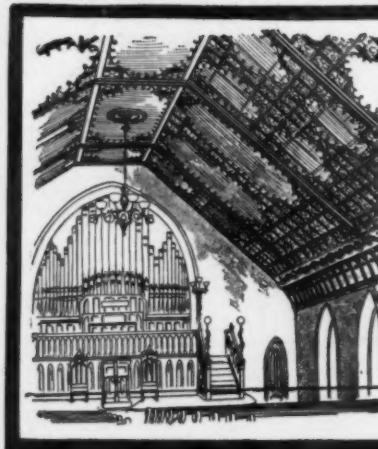
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BUILDING INTELLIGENCE.

(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.]

ADVANCE RUMORS.

Alexandria, La.—Architect L. E. Burkett, Greenville, O., has prepared plans for the proposed high-school building. It will be constructed of brick and stone, and cost \$50,000.

Alton, Ill.—The Congregational Society has had plans prepared for a \$12,000 church to replace the present structure at 6th and Henry Sts.

Ames, Ia.—The plans of Proudfoot & Bird, Des Moines, were selected for the engineering building for the State Agricultural College. It will be a four-story fireproof brick structure with stone trimmings, 100' x 210'; cost, \$150,000.

Atlanta, Ga.—A Methodist Church, to cost \$25,000, will be erected on Peachtree and 5th Sts.

Baltimore, Md.—St. Joseph's Catholic Society will erect a new church after plans by Architect Henry Simpson, Washington, D. C. It will be a granite and brick structure having two steeples, 51' x 134', and will cost \$40,000.

Wyatt & Nolting have furnished plans for a private school for the Calvert School Construction Co. It will be constructed of brick and stone, three stories high, and will cost \$60,000.

Block Island, R. I.—A Catholic church, with a seating capacity of 700, is to be erected this summer on land of Hon. Joshua T. Dodge. It is built and maintained under the direction of Bishop Harkins, of Providence.

Buffalo, N. Y.—Chas. G. Horning & Co. will build

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

a three-story frame factory at 165 Adams St., to cost about \$5,000.

The Fathers' Minors Conventuals will build a three-story brick convent at the corner of Clark and Kent Sts., after plans by Architect Carl Schiell; cost, about \$18,000.

Reports state that the Board of Public Works will advertise soon for competitive plans for the proposed West Side High School. First prize will be the contract for work of design, second prize, \$500, third prize, \$300, fourth prize, \$200. Estimated cost of the building is \$250,000.

Cadillac, Mich.—The Anheuser-Bush Brewing Co. will erect a saloon and flat building on Harris St. It will be 50' x 75', two stories high, and cost \$10,000.

Charlotte, N. C.—The Glenmowery Manufacturing Co. was incorporated recently with a capital of \$300,000 to build a cotton-factory here.

Cleveland, O.—The Cleveland Electric Illuminating Co. will erect a brick power-house addition on Canal St., to cost \$70,000.

Columbus, O.—H. A. Linthwaite has prepared plans for remodeling the property at 60 E. Main St., for the Columbus Lodge of Elks. A three-story addition of brick and stone will be built; cost, \$23,000.

Cynwyd, Pa.—Work will begin at once on the proposed St. John's Episcopal Church. It will be built after the old English type of architecture of Chestnut Hill granite, with Indiana limestone trimmings; will be one-story high, tower-shaped, 40 feet square, 66 feet in height, and on the southeastern corner there will be a belfry 73 feet above the ground; cost, \$20,000.

Denver, Col.—The Denver Building Co. will erect a flat-building after plans by A. L. Dorr, of Minneapolis, Minn. It will have three stories and basement, 100' x 125', and will be constructed of brick and cut-stone; cost, \$40,000.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Duluth, Minn.—Architect J. J. Wangenstein is preparing plans for a residence to be erected on Superior St., near 11th Ave., for L. S. Loeb; cost, \$12,000.

East St. Louis, Ill.—The Colored Odd Fellows are having plans prepared by B. A. Mueller for a new building to be erected at Tudor and Champa Sts.; cost, \$10,000.

Fargo, N. D.—Hancock Bros. are drawing plans for an iron, brick and stone high-school building to be erected here; cost, \$40,000.

Gardner, Mass.—Barker & Nourse, Worcester, have prepared plans for a four-story brick block for A. Rosenberg. There will be two stores on the ground floor and six tenements above; cost, about \$20,000.

Glenwood, Ia.—Liebbe, Nourse & Rasmussen, Milwaukee, are preparing plans for a hospital building to be erected at the School for the Feeble Minded. It will be a fireproof structure, 80' x 80', costing \$35,000.

Grand Rapids, Mich.—Dr. C. H. Johnston will erect a two-story and attic frame residence after plans by Architect Wm. Williamson; cost, \$6,000.

Hallowell, Me.—Erskine Hall at the Maine Industrial School for Girls, which was burned recently at a loss of \$14,000, will be rebuilt at once.

Leominster, Mass.—F. P. Porter is having plans prepared by Barker & Nourse, Worcester, for a 38' x 45', ten-room dwelling.

Architects Frost, Briggs & Chamberlain are drawing plans for a large double house to be erected for F. S. Pearson. It will be of frame construction, two stories high, and of Colonial type of architecture.

Louisville, Ky.—Architect W. H. McDouglass is preparing plans for a brick flat-building to be 60' x 100' and five stories high; cost, \$37,000.

Luverne, Minn.—C. D. McFadden, the proprietor of Hotel Luverne, contemplates enlarging the building and making improvements, to cost \$10,000.

Macon, Ga.—The Trustees of the Wesleyan Female College contemplates erecting a \$20,000 annex.

Madison, Wis.—A. D. Conover has prepared plans for the W. M. C. A. Building to be erected here by the University of Wisconsin, at a cost of \$75,000.

Marquette, Wis.—The French Catholic congregation will erect a brick convent building, to cost \$12,000.

Milwaukee, Wis.—Architect K. S. Evans has prepared plans for an apartment building to be erected on Holton St. It will be a frame structure, 24' x 63', two stories high, and will cost \$9,000.

C. F. Ringer has prepared plans for a residence to be erected at Cedar St., near 30th St. It will be built of brick, 35' x 48', two stories high, and will cost \$8,000.

Minneapolis, Minn.—D. H. Woodworth will erect a dwelling on 1st Ave., near 24th St., after plans furnished by W. M. Kenyon. It will be a frame structure, 34' x 36', and two stories high; cost, \$9,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Monticello, Ia.—The Congregational Society, Rev. C. C. Warner, pastor, will build a \$10,000 brick church, plans for which have not yet been drawn.

Oak Harbor, O.—Philip Kramb will erect a store building after plans by Architect S. H. Shively, Fremont. It will be a two-story, 45' x 115', brick and stone structure, costing \$9,000.

Oelwein, Ia.—Hanson Bros. and others will build a row of brick stores after plans prepared by Nettcott & Donnan, of Independence. It will be 50' x 140', two stories in height, constructed of brick and stone, and will cost \$17,000.

Oskaloosa, Ia.—J. P. Hiatt will erect a two and one-half story dwelling, to cost \$8,000.

Oxford, Mass.—At a special town meeting held recently the proposition of Chas. Larned, of Boston, to erect a free public library building here as a memorial to his mother was accepted. The cost will be about \$18,000, two-thirds of which will be donated by Mr. Larned.

Philadelphia, Pa.—John G. Carruth, of this city, has presented the University of Pennsylvania with \$20,000 to build a house in the university dormitory system in West Philadelphia.

Pittsburgh, Pa.—L. C. Phipps, of the Carnegie Steel Co., will, it is reported, build a residence to cost \$100,000, on 5th near Anderson Ave.

Providence, R. I.—Architect Fred Pope, Tremont Building, Boston, will draw plans for the reconstruction of the old Providence Athletic Association Building into a hotel. Two stories will be added to the structure and material changes will be made in the interior.

Architects Martin & Hall, Industrial Trust Building, are drawing plans for the buildings to be erected at the Insane Hospital at Howard; cost, \$300,000.

Rochester, Minn.—Architect E. S. Stebbins, Minneapolis, is preparing plans for the Masonic Temple to be erected here. It will be three stories in height, 50' x 100', with construction material of iron, brick, stone and terra-cotta; cost, \$25,000.

Rockford, Ill.—The factory of the Rockford Paper Co., which was destroyed by fire last month at a loss of \$30,000, will be rebuilt at once.

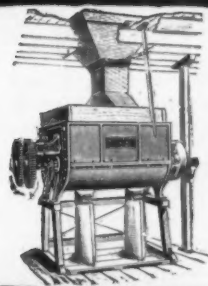
San Diego, Cal.—Dr. D. Goehenauser and Dr. L. Y. Ketcham, of Escondido, will erect a \$12,000 sanitarium on Beech St., near 5th St.

Schenectady, N. Y.—M. Lesner has had plans prepared by G. H. Abrams for a brick and terra-cotta hotel; cost, about \$20,000.

St. Joseph, Mo.—The United Presbyterian Society contemplates building a church at the corner of 12th and Felix Sts.; to cost \$20,000.

St. Louis Park, Minn.—The Minnesota Beet-sugar Co. will enlarge its plant at a cost of \$85,000. The improvements include a new brick building.

St. Louis, Mo.—Architect Isaac S. Taylor is drawing plans for the Bank of Commerce Building to be erected at the corner of Broadway and Olive St. The proposed structure will be eleven stories in height, 87½' x 127½', and will be built of granite and



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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

light brick with trimmings of terra-cotta. It will be of the French Renaissance type of architecture and will be one of the finest structures of the kind in the West; cost, about \$500,000.

Louis Meinecke will erect a stone residence on Wabash Ave., near King's Highway, to cost \$10,000.

Toledo, O.—Edward Ford will erect a \$30,000 residence after plans by Architect George S. Mills.

Tomahawk, Wis.—Architect J. H. Jeffers, Stevens Point, is drawing plans for the new city-hall. It will be built of brick with stone trimmings; cost, \$8,000.

Wallace, Idaho.—Architects Preusse & Zittle have prepared plans for a row of stores and offices to be erected by Holahan & McKinley; cost, \$20,000.

Waterloo, Ia.—Shaw & Shaw have prepared plans for a wholesale building for the Waterloo Warehouse and Storage Co. It will be built of brick and limestone and Bedford stone, 48' x 140', five stories high, and will cost \$20,000.

Wilkes Barre, Pa.—The Orthodox Russian Society have had plans prepared for a church by Architects Neuner & Walker. It will be a brick and stone structure, costing \$10,000.

Williamsport, Pa.—Architect E. V. Seeler, Philadelphia, has prepared plans for the Brown Free Public Library; cost, \$100,000.

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BUILDING INTELLIGENCE.

(Educational Continued.)

st'y school, 50' x 58', steam; \$15,000; o., Rev. Henry Audiffred; a., Cormier & Burgess.
Detroit, Mich. — Russell St., two-st'y & base, bk. school, 72' x 90', slate roof, hot blast; \$40,000; o., City; a., Malcomson & Higginbotham.
Greenwich, Conn. — Two-st'y bk. parochial school, 60' x 70'; \$15,000; o., St. Mary's Congregation; a., H. C. Pelton, 1133 Broadway.
Minneapolis, Minn. — Two-st'y bk. mechanics art building, 47' x 194', slate roof, steam; \$20,000; o., University of Minnesota; a., Chas. E. Aldrich.
West Liberty, O. — Two-st'y & base, st. school, 79' x 79', slate roof, hot air; \$17,000; o., City; a., Yost & Packard, Columbus.
Winchester, Ill. — Two-st'y & base, bk. school, 92' x 108', slate roof, steam; \$18,000; o., City; a., N. A. Buckingham & Son, Jacksonville.

HOUSES.

Boston, Mass. — Waldeck St., No. 51, 2½-st'y fr. dwell., 28' x 48', pitch roof, furnace; \$5,000; o. & b., S. Chadbourn; a., C. A. Russell.
Francis St., nr. Binney St., 2½-st'y fr. dwell., 26' x 61', pitch roof, furnace; \$6,000; o., a. & b., J. C. Spillane.
Vernon St., Nos. 107-109, 2 three-st'y dwells., 18' x 22' x 53', flat roof; \$11,000; o., Sarah Pitnoff.
York St., nr. Glenway St., fr. dwell., 30' x 50', pitch roof, furnace; \$5,500; o., a. & b., Victor Wolmer.
Adelaide St., No. 20, 2½-st'y fr. dwell., 36' x 50', pitch roof, hot water; o., Philip A. Mack; a. & b., J. P. Campbell.
Faneuil St., nr. New Castle Road, 2½-st'y fr. dwell., 29' x 45', pitch roof, furnace; \$6,000; o., Frances Park; b., C. R. Park; a., Geo. E. Parsons.
Francis St., 2½-st'y fr. dwell., 26' x 62', pitch roof, furnace; \$6,000; o., a. & b., J. C. Spillane.
Waubesa St., nr. Humboldt Ave., fr. dwell., 30' x 48', hip roof, furnace; \$6,000; o., Sarah Eaves; b., Henry A. Black; a., Wm. Smith.
Willis St., cor. Chase St., 2½-st'y fr. dwell., 32' x 46', pitch roof, furnace; \$6,000; o., Charlotta A. Powell; a., F. G. Powell.
Speedwell St., nr. Hamilton St., 2½-st'y fr. dwell., 28' x 44', pitch roof, furnace; \$5,000; o., Edward Walsh.
Esmond St., No. 26, 2½-st'y fr. dwell., 33' x 43', pitch roof, furnace; \$5,500; o. & b., J. V. Whidden; a., C. A. Russell.
Amory St., Nos. 170-172, 2½-st'y fr. dwell., 37' x 38', pitch roof, furnace; \$5,500; o., J. N. Landers; b., J. A. Crawford; a., Wm. H. Brainerd.
Alston Heights, nr. Cambridge St., 2½-st'y fr. dwell., 43' x 48', pitch roof, furnace; \$7,500; o. & b., Mitchell & Sutherland; a., A. M. Marble.
Gayland St., nr. W. Cottage St., fr. dwell., 24' x 43', pitch roof, furnace; \$5,000; o., F. E. Blanchard; a., F. A. Norcross.
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Willimantic, Conn. — The American Thread Co. contemplates building a two-story addition to Mill No. 4, of a sufficient capacity to operate 40,000 spindles.

ALTERATIONS AND ADDITIONS.

Brooklyn, N. Y. — Paigide Ave., s w cor. Provost St., repair damage by fire; \$20,000; o., W. H. McCord, Greenwich, Conn.; a., W. E. Squire, 642 Lorimer St.

Hyde Park, N. Y. — Alteration & addition to 2½-st'y fr. dwell.; \$15,000; o., John S. Huyler, 64 Irving Pl., New York City; a., Cadz, Berg & See, 31 E. 17th St., New York City.

New York, N. Y. — W. Eighty-ninth St., No. 112, three-st'y extension, 22' 6" x 28' 8"; \$15,000; o., N. Y. Telephone Co., 15 Dey St.; a., C. L. W. Eldlitz, 1123 Broadway.

Philadelphia, Pa. — Forty-first and Brown Sts., three-st'y bk. addition to school, 45' x 68', steam; \$30,000; o., City; b., Wm. J. Smith.

Spruce St., nr. 6th St., three-st'y bk. addition to school, 66' x 80'; \$15,000; o., City; b., J. H. Jordan.

Somerville, Mass. — School St., additions & alterations to church; \$12,000; o., School St. Baptist Society; b., Wm. H. Iliffe; a., Prescott & Sidebottom.

Worcester, Mass. — Bloomingdale Road, addition to round-house; \$3,000; o., B. & A. R. Co.; b., D. W. Ellinwood.

One-st'y bk. factory addition, 50' x 60'; \$6,600; o., Harrington & Richardson Arms Co.; b., Henry Mellen & Son; a., C. F. Wesson.

APARTMENT-HOUSES.

New York, N. Y. — Tenth Ave., No. 528, five-st'y bk.

BUILDING INTELLIGENCE.

(Apartment-Houses Continued.)

flat, 24' 8" x 77' 5" x 77' 9"; \$26,000; o., Leopold Kaufmann, 35 Nassau St.; a., Schneider & Herter, 46 Bible House.

Boston Ave., nr. 168th St., seven-st'y bk. flat, 54' x 90'; \$80,000; o., Elizabeth Blundell, 1045 Fox St.; a., John De Hart, 1039 Fox St.

One Hundred and Twenty-ninth St., nr. 8th Ave., seven-st'y bk. & st. flat, 98' 10" x 100'; \$140,000; o., Simon Habermann, 250 W. 121st St.; a., G. A. Schellenger, 130 Fulton St.

St. Nicholas Ave., cor. 114th St., seven-st'y bk. flat, 59' 9" x 119' 3"; \$169,000; o., S. C. Judson, 530 W. 187th St.; a., Rose & McNeil, 39 E. 42d St.

One Hundred and Nineteenth St., nr. Park Ave., 3 five-st'y bk. flats & stores, 20' 27' 27' 6" x 85' & 87'; \$75,000; o., Schmidt Bros., 112 E. 129th St.; a., Edw. Wenz, 1491 Third Ave.

W. Fifty-first St., No. 322, five-st'y bk. & st. flat, 20' x 88'; \$22,000; o., John Rankin, 322 W. 51st St.; a., M. V. B. Fardon, 243 W. 57th St.

One Hundred and Fifty-first St., nr. St. Nicholas Pl., seven-st'y bk. & st. flat, 53' 4" x 65' 9" x 92' 7"; \$225,000; o., Maurice Polk, 103 W. 114th St.; a., James & Leo, 2585 Broadway.

CHURCHES.

New York, N. Y. — Alexander Ave., cor. 141st St., two & three-st'y bk. & st. church & parsonage, 75' x 87' 8", slate & tin roof; \$55,000; o., Alexander Ave. Baptist Church; a., Ward Davis, 203 Broadway.

St. Louis, Mo. — Twentieth and St. Louis Ave., bk. church, 60' x 90', slate roof, steam; o., St. Paul's M. E. Society; a., Matthews & Clark.

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No. 585,275, May 25, 1897	No. 601,426, Mar. 29, 1898
No. 583,276, May 25, 1897	No. 608,540, Aug. 2, 1898
No. 591,688, Oct. 12, 1897	No. 608,972, Aug. 9, 1898

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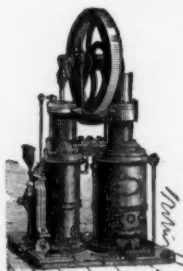
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(Houses Continued.)

x 40', pitch roofs, furnaces; \$25,000; o., J. W. Patson; a. & b., H. J. Ecklund.

Brooklyn, N. Y. — St. Mark's Ave., nr. New York Ave., three-st'y bk. dwell., 57' x 103' 6", steam heat; \$125,000; o., Clarence W. Seaman, 1267 Pacific St.; a., M. W. Morris, 45 Exchange Pl.

Cambridge, Mass. — Buckingham St., two-st'y fr. dwell., 30' x 38', furnace; \$6,000; o., E. S. Hill; b., F. A. Perkins; a. Charles A. Ely.

MERCANTILE BUILDINGS.

Cambridge, Mass. — Banks St., four-st'y bk. building, 35' x 96', flat roof, steam; \$20,000; o., Reversible Collar Co.; b., W. L. Clark & Co.; a., Arthur F. Gray.

New York, N. Y. — William St., No. 120, eight-st'y bk. mercantile building, 24' 5" x 25' 1" x 111' 7" & 101' 9", bk. roof; \$150,000; o., A. & J. Plaut, 73 E. 92d St.; a., Robert Maynicke, 725 Broadway.

COMPETITIONS.

TOWN-HALL.

[At Glens Falls, N. Y.] Plans and specifications will be received by the Board of Trustees until June 18th, for a town-hall. T. I. DILLON, clerk. 1277

SCHOOL-HOUSE.

[At Natchez, Miss.] Sealed plans and specifications will be received at the City Clerk's office until June 14th, for the erection of a modern school-building. W. G. BENBROOK, Mayor. 1276

PROPOSALS.

FACTORY.

[At Shreveport, La.] Sealed bids will be received until June 11th, for building the Hargrove Cotton Mill. J. W. TABER, sec. 1276

JAIL.

[At Erie, Pa.] Sealed proposals will be received until June 14th, for the erection of a county jail. J. A. ROBINSON, Co. Clk. 1276

Treasury Department, Office Supervising Architect, Washington, D. C., June 1st, 1900. Sealed proposals will be received at this office until 2 o'clock P. M. on the 6th day of July, 1900, and then opened, for the alterations and additions (except electric wiring and conduits) to the U. S. Post-office Building, Springfield, Massachusetts, in accordance with the drawings and specification, which will be furnished at the discretion of the Supervising Architect on application at this office or at the office of the Postmaster, Springfield, Mass. JAMES KNOX TAYLOR, Supervising Architect. 1277

SCHOOL-HOUSE.

[At Easton, Minn.] Sealed proposals will be received until June 18th, for the erection of a school-house. REV. MR. LESCHES. 1277

HOSPITAL BUILDINGS.

[At Athens, O.] Sealed proposals will be received by the Trustees of the Athens State Hospital until June 23d, for an infirmary and an amusement building. E. H. RORICK, sec. 1277

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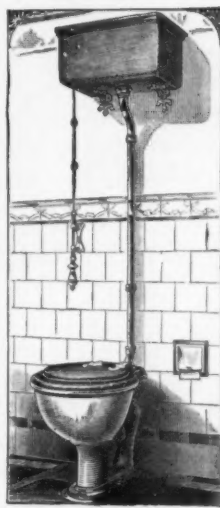
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PROPOSALS.

CHURCH.

[At Anoka, Minn.] Sealed proposals will be received until June 30th, for the erection of a church for the First Baptist Society. JOHN GOSS. 1278

SCHOOL-HOUSE.

[At Aneta, N. D.] Sealed proposals will be received until June 26th, for the erection of a school-house. J. G. GUNDERSON, pres. 1278

CHURCH.

[At Brookings, S. D.] Sealed proposals will be received by the Building Committee of the Presbyterian Society for the erection of a church. F. J. CARLISLE, Chairman. 1276

HIGH SCHOOL.

[At Chagrin Falls, O.] Sealed proposals will be received by the Board of Education until June 11th, for the erection of a high school. J. W. SCOTT, clerk. 1276

HOSPITAL.

[At Columbia Falls, Mont.] Sealed proposals will be received by the Board of Managers of the Soldiers' Home until June 10th, for erecting a hospital building. CAPT. H. S. HOWELL, sec. 1276

JAIL WING.

[At Mansfield, O.] Bids will be received until June 20, for an east wing to the Ohio State Reformatory. CHAS. H. WORKMAN, Sec. Bd. Mgrs. 1277

Treasury Department, Office of the Supervising Architect, Washington, D. C., May 29th, 1900. Sealed proposals will be received at this office until 2 o'clock P. M. on the 5th day of July, 1900, and then opened, for furnishing the heating and ventilating apparatus, complete in place, for the extension U. S. Post-office Building at Columbus, Georgia, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Columbus, Ga., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1276



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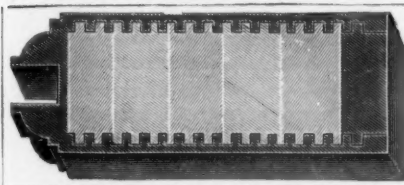
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. . . CODE OF ETHICS . . .

Prepared in Conformity with the Best Standards of Practice, and Recommended to its Members by the Boston Society of Architects, was

ADOPTED BY THE SOCIETY, FEBRUARY 1, . . 1895. . .

SECTION 1. No Member should enter into partnership, in any form or degree, with any builder, contractor, or manufacturer.

SECTION 2. A Member having any ownership in any building material, device or invention, proposed to be used on work for which he is architect, should inform his employer of the fact of such ownership.

SECTION 3. No Member should be a party to a building contract except as "owner."

SECTION 4. No Member should guarantee an estimate or contract by personal bond.

SECTION 5. It is unprofessional to offer drawings or other services "on approval" and without adequate pecuniary compensation.

SECTION 6. It is unprofessional to advertise in any other way than by a notice giving name, address, profession, and office hours, and special branch (if such) of practice.

SECTION 7. It is unprofessional to make alterations of a building designed by another architect, within ten years of its completion, without ascertaining that the owner refuses to employ the original designer, or, in event of the property having changed hands, without due notice to the said designer.

SECTION 8. It is unprofessional to attempt to supplant an architect after definite steps have been taken toward his employment.

SECTION 9. It is unprofessional for a Member to criticise in the public prints the professional conduct or work of another architect except over his own name or under the authority of a professional journal.

SECTION 10. It is unprofessional to furnish designs in competition for private work or for public work, unless for proper compensation, and unless a competent professional adviser is employed to draw up the "conditions" and assist in the award.

SECTION 11. No Member should submit drawings except as an original contributor in any duly instituted competition, or attempt to secure any work for which such a competition remains undecided.

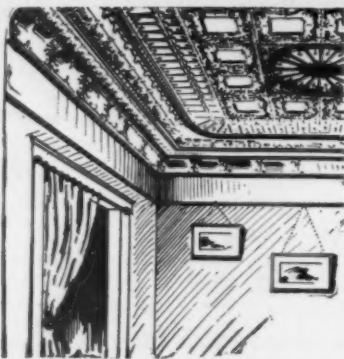
SECTION 12. The American Institute of Architects' "schedule of charges" represents minimum rates for full, faithful and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase, rather than to accept work to which he cannot give proper personal attention.

SECTION 13. No Member shall compete in amount of commission, or offer to work for less than another, in order to secure the work.

SECTION 14. It is unprofessional to enter into competition with or to consult with an architect who has been dishonorably expelled from the "Institute" or "Society."

SECTION 15. The assumption of the title of "Architect" should be held to mean that the bearer has the professional knowledge and natural ability needed for the proper invention, illustration and supervision of all building operations which he may undertake.

SECTION 16. A Member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen and students.



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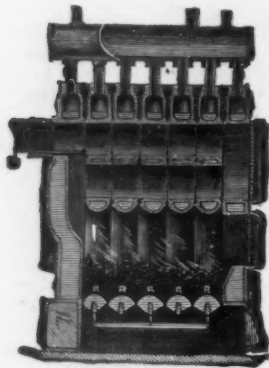
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