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Complaint of Contractors against the United States Attorney-General. — Death of Dankmar Adler, Architect. — Death of Frederic E. Church, Landscape-Painter. — The new New York Tenement-house Commission. — The New York Soldiers' Monument Site once more. — The Shorthand Method of auditing Accounts employed by French Architects. — The American and Turkish Pavilions at the Paris Fair. — The Wooden Interior Finish of Faneuil Hall for Sale. . . . 17

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ONE would naturally suppose that however much an executive might be disposed to evade the enforcement of the law's mandate, however prone legislators to enact laws for the unfair advantage of the few, however ready lawyers were to quibble and distort meanings, however prone judges might be to soil their ermine, one would suppose, we say, that a department of justice itself might safely be trusted, in its own acts, to regard the strict interpretation of the law with the most scrupulous exactness. This, however, does not seem to be the opinion held by sundry contractors, who are displeased with the action of the Attorney-General of the United States in not throwing open to public competition—as it is certainly generally supposed that all Government contracts of large amount must be thrown—the contracts for a national prison at Atlanta, Ga., which is to cost about one million dollars, and the new building for the Department of Justice in Washington itself, which is to cost at least as much. In the first case, six firms were specially requested to furnish estimates, and in the second ten, bids for uninvited contractors not being received, and it is no wonder that this unusual course has excited the ire of men who are always after all the good things they can pick up. It goes without saying that the Attorney-General unquestionably finds in the terms of the acts which govern him, a full authority for this unusual step, and sits in no fear of the "scandalous revelations" with which he is threatened, and it is only fair to say that we believe that, in consequence of this careful selection of permitted bidders, these buildings will be erected with less delay and friction, and with more satisfactory and enduring results, than is usually the case with our public buildings. Because of the discussion about, and the criticism of, the manner in which the Supervising Architect's office has in the past designed and erected public buildings, Congress has of late shown a disposition to avoid similar disasters, and has on several occasions empowered the Department of the Interior, the Department of Justice, and the War Department, to procure designs for, and carry out the erection of, certain buildings which the several departments needed. Amongst these special buildings are the ones at Atlanta and Washington, the contracts for which are now the object of the attack of disgruntled contractors.

THROUGH the death of Dankmar Adler at Chicago, this week, the profession loses one of the few members whose efforts have been of real value to the profession in its corporate capacity. One of the most active organizers of the Western Association of Architects, he was, for several years,

its president, and after the coalition of that body with the American Institute of Architects became secretary of the united societies. In both these offices his justness of view, his balance of mind and the capacity to think quickly when on his feet, and speak cogently in consequence, were often of the utmost value to the advancement of the true interests of the professional body. Born the son of a Jewish rabbi, at Langsfeld, in Saxe-Weimer, July 3, 1844, he came to this country just ten years later, and in the next eight years acquired enough of the spirit of an American to take part, during three years, in the Civil War, as a member of Battery M, of the First Illinois Artillery. Returning to civil life he pursued his studies in Detroit, in the offices of Julius Melchers, John Schaefer and E. Willard Smith. In 1869, he began independent practice in Chicago with A. J. Kinney, the partnership lasting two years. A second partnership with Edward Burling lasted seven years, while a third with Louis H. Sullivan endured for the fourteen years between 1881 and 1895. Then, for a year or so, finding that in the hard times the needed income was hardly to be drawn from the architectural field, he served as engineer to one of the large elevator manufacturing concerns in Chicago, and in the last few years has been occupied mainly as consulting architect—a position which his thorough knowledge of engineering and the judicial balance of his mind admirably fitted him to fill. He was able, too, to do a last service to the profession as a member of the Board of Examiners for Illinois Architects.

BECAUSE of his Hebraic descent, Mr. Adler naturally did considerable work for the people of his faith and amongst other buildings designed the synagogues for the congregations of Sinai, Zion, Anshe Maariv and Isaiah in Chicago. Naturally, the greater part of his work was done during the great building period that coincided with his partnership with Mr. Sullivan and practically terminated with their building of the Transportation Building of the World's Fair, the panic and hard times following immediately thereafter. During this period of activity, which for the firm began with the building of the Auditorium in Chicago, a large number of important buildings were erected under his care: the Central Music-hall, the Schiller Opera-house, and the Stock Exchange Building in Chicago, the Union Trust and the Wainwright Buildings and the St. Nicolas Hotel in St. Louis, the Opera-house at Pueblo, Col., the Illinois Central Railroad Station at New Orleans and the Guaranty Building at Buffalo, besides a large number of small and private buildings. While the external design of most of these buildings was unquestionably due to Mr. Sullivan, the fact that they were well built and have proved to be income-returning investments of capital is as unquestionably due to Mr. Adler's ability as a constructor and man of business. During the period of his activity, Mr. Adler was always an interested adviser of the younger men, not only through personal intercourse with those who sought him out for the purpose, but also through frequent contributions to the various professional journals. His career is but another example of the vast amount of good that has accrued to this country through the advent of a certain class of immigrants.

NATURE endowed the late Frederic E. Church, who died last week at the age of seventy-four, with something more than a keen appreciation of her beauties, and the ability to picture them faithfully upon canvas. Unendowed with a robust physique in his youth, and a passion for adventure, he would have been content to satisfy himself with expressing the quiet rural scenes to be found amid cultivated neighborhoods, and doubtless would have acquired a reasonable fame and a decent livelihood. But thanks to his physical make-up, he was able to study nature in her wildest recesses and most widely separated nooks. The wilds of the South and North American mountains, the volcanic regions of Mexico, were hardly more familiar to him than the bergs and ice-floes of the Labrador coast or the barrens of Palestine. But, deserving artist as he was, he owed his prosperity, in so far as that was involved in the making of a name, largely to a purely accidental circumstance. It was his fortune that his great painting, great in size as in real merit, the "Heart of the Andes," was just ready for exhibition at that time during the Civil War when

the Sanitary Commission was holding its great fairs in Boston and New York, fairs to which every one thronged, under the sense of duty, and carried with them hearts and feelings keyed to a delicacy of sensibility that this generation knows nothing of. When such a picture as the "Heart of the Andes" is seen by multitudes quickened to the perception that life and the world hold in them other things than gross materialities, there can be no further question of making a name, so far as the artist is concerned. In Mr. Church's case, the vogue thus secured, and the large prices, unparalleled in those days, that in consequence were paid for his paintings, brought him competence comparatively early in life.

THE Tenement-house Commission just appointed by Governor Roosevelt is one markedly high in the character and reputation of the individual members who compose it, and if it selects its own working sub-committees with discrimination the results of its labors should be as deserving of respect as any other respectable document that is "received and placed upon the table." Governor Roosevelt is a young man given to assuming that because an idea is fresh to him it is also a novelty to all men; he is also "in politics" up to his lips, and it is not unlikely that he is counting on his new pose as the benevolent friend of the tenement-house tenant to add largely to his vote when he stands for reelection. What tenements are and what tenements might be if the tenants chose to have them so is understood by every one who is at all likely to read the report of this new commission, and there really seems not much need of adding to the statistical tabulations that abound on every side. So long as the law allows grog-shops on every corner in the tenement-house districts and thus deliberately invites the heads of families, female as well as male, to spend their wages to the end that city and State may get their millions through liquor-licenses, just so long will children sleep in rags on cold floors in countless dirty homes and governors and tenement-house commissions cannot save them from suffering, disease and vice.

WHAT will happen if ever money enough is secured to build a permanent "Dewey arch" in New York and the inhabitants of that clique-divided city, whose inhabitants know not what good citizenship really is, actually settle down to decide where the arch shall finally be placed, can be inferred from the history of the Soldiers' and Sailors' Monument, to which we have often referred. A few days ago the committee in charge of the latter finally fixed on a site on the Riverside Drive between Seventy-ninth and Eightieth Streets, but before anything can be done toward actual building, the dissolution of a certain temporary injunction must be procured. On Monday last, Judge Fitzgerald listened to the argument of the petitioner, a lady living on the Riverside Drive, to be sure, but at Eighty-ninth Street, — nearly ten blocks above the selected site! — and reserved his decision. Apart from the plea that certain technicalities have not been duly observed by the Board of Commissioners of the Soldiers' and Sailors' Monument, the lady rests her case on the allegations that the monument will obstruct her view, that it will attract crowds of sightseers, to her annoyance and the invasion of her aristocratic seclusion, and that the Riverside Drive was "dedicated to the public use as an open park, for the benefit of the public and of the adjoining property-owners." The italics are ours. Perhaps the assertion that a public park is created for the benefit of present or future abutters is not as funny as we think it is, but the allegation strikes us, at least, as humorous.

IF they do not do things better in France than elsewhere, they, at least, do them differently, as a young American architect discovered during a temporary residence in Paris, when he was called on to act in his professional capacity by a fellow-countryman who had just bought a house and wished to have some rather important changes in it carried out. The alterations were effected without trouble and with dispatch; but the job appears to have been one not done under contract and the American owner was naturally staggered at receiving a bill several yards in length containing an infinitude of items and totalling up a good round number of thousands of francs. Just as naturally he sent the account to his architect for audit. The latter, as he knew little of French practice and nothing at all of the *série de prix* and its uses, was puzzled how to deal with an account detailed with such minuteness that one item was a charge

of one centime each for oiling so many hinges! Conscious of his inability to handle the matter properly, the American architect sought the advice of a French practitioner of his acquaintance, who assured him that the common method of auditing a builder's claim was to "blue pencil" every fifth or sixth item, but if the cancelled item happened to be a large one about fifty per cent of it might be allowed. The method seemed too simple not to be followed, but as the American entertained a proper misgiving that he was being made the victim of a hoax, he hedged as much as possible by procuring from the owner a check for the account in full after it had been reduced about twenty per cent through this rough-and-ready auditing. Then the builder was summoned and his mutilated account was handed him in lordly fashion, together with the owner's check, and he was asked to receipt the bill and close the matter at once. With a glance, merely to satisfy himself that the check agreed with the revised footing, the receipt was given at once, with profuse thanks and the statement that it was not often that a poor builder was treated with "so much consideration." But the incident did not close here, for the builder, placing the check in one pocket, drew from another a substantial sum in gold, saying that here was Monsieur's customary commission. As this, too, appeared to be one of the customs of the country, the American accepted it and later turned it over to his client as an added rebate on his bill. Later, in reporting to his French *confrère* that no trouble had ensued on following his advice he mentioned what he had done with the builder's bribe, and was at once overwhelmed with reproaches and demands to know by what right he undertook to teach French architects how they ought to conduct their business. Why, this refunding to the owner of the commission that the builder *always* paid to the architect was an insult to the whole body of French architects! *Autre pays, autres mœurs.*

A PHRASE — "international discourtesy" — which has been much used by the newspapers of late apropos of divers political happenings seems to exactly fit a piece of caddishness of which, if reports are correct, the American Commissioner for the Paris Exposition has been guilty. The American pavilion on the bank of the Seine and the Turkish are next-door neighbors, and the American Commissioner, finding that the dome with which the Mussulmans naturally proposed to roof their building would injure the effect of the dome covering the American pavilion, effected through the compulsion of the Exposition authorities the extirpation of the Turkish hemisphere. Finding their original scheme inadmissible, the Turks apparently sought a substitute in a tower, only to meet the further opposition of the American official, who seems to know nothing of the laws of good breeding or international usage, for he is said to have addressed another protest to the Director-General in which he declares that he is "satisfied you have been led by pressure of matters upon you to hastily sign an agreement which permits so comparatively an unimportant nation to seriously injure the building of such a great nation as the United States." This characterization of the great Ottoman Empire strikes us as a novelty in diplomatic language although it comes from one [so unfortunately] representing "such a great nation as the United States."

WHEN last year the Boston City Government decided to make Faneuil Hall fireproof, so far as the nature of things allowed, it was necessary, of course, to take out and replace a considerable amount of the interior woodwork. Instead of tearing it out roughly and allowing the street arabs to carry it away for firewood, the director of the Architect Division of the Engineering Department [save the name!], with a nice perception of propriety and fitness, had it carefully removed, and now draws attention to the fact that this material can be obtained and utilized for some more worthy purpose. As the interior of Faneuil Hall was not particularly rich in design, the orders used being the Doric and the Ionic and suitable only for a somewhat large room, it is not easy to make use of this material piecemeal, but there are now building in various places sundry memorial halls and historical-society buildings, in one or more of which some of this material could be used, not only to architectural advantage, but still more to the salvation of that patriotic essence that may be supposed to radiate from wood that has absorbed into its pores the speeches of so long a line of patriots, the applause of so many enthused thousands.

ARCHITECTURAL ACOUSTICS.<sup>1</sup> — II.

REVERBERATION: ABSORBING POWER OF WALL-SURFACES.

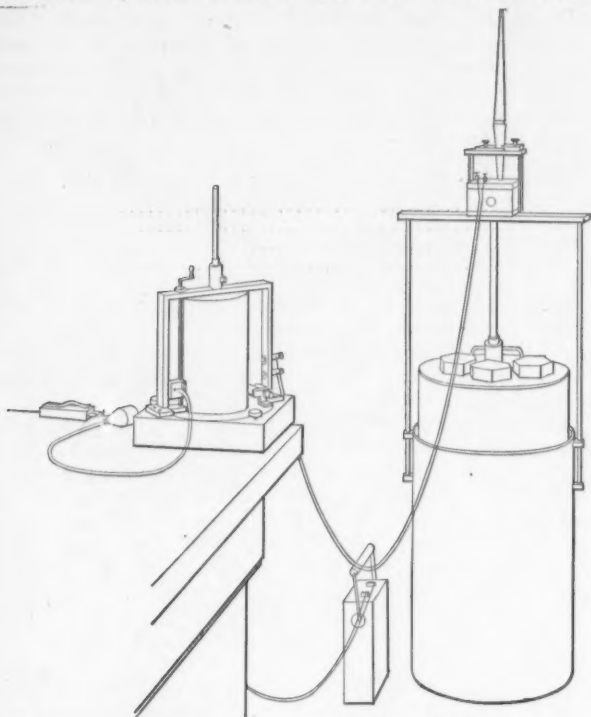


Fig. 1. Chronograph, Battery, and Air-reservoir, the latter surmounted by the Electro-pneumatic Valve and Organ-pipe.

IN the introductory article the problem was divided into considerations of loudness, of distortion, and of confusion of sounds. Confusion may arise from extraneous disturbing sounds, street noises and the noise of ventilating-fans, or from the prolongation of the otherwise discrete sounds of music or the voice into the succeeding sounds. The latter phenomenon, known as reverberation, results in what may be called with accuracy and suggestiveness, residual sound. The duration of this residual sound was shown to depend on the amount of absorbing material inside the room, and also, of course, on the absorbing and transmitting power of the walls; and a method was outlined for determining the absorbing power of the former in terms of the absorbing power of some material chosen as a standard and used in a preliminary calibration. A moment's consideration demonstrates that this method, which is of the general type known as a "substitution method," while effective in the determination of the absorbing power of furniture and corrective material, and, in general, of anything that can be brought into or removed from a room, is insufficient for determining the absorbing power of wall-surfaces. This, the absorbing power of wall-surfaces, is the subject of the present paper; and as the method of determination is an extension of the above work, and finds its justification in the striking consistency of the results of the observations, a more elaborate description of the experimental method is desirable. A proof of the accuracy of every step taken is especially necessary in a subject concerning which theory has been so largely uncontrolled speculation.

Early in the investigation it was found that measurements of the length of time during which a sound was audible after the source had ceased gave promising results whose larger inconsistencies could be traced directly to the distraction of outside noises. On repeating the work during the most quiet part of the night, between half-past twelve and five, and using refined recording apparatus, the minor irregularities, due to relaxed attention or other personal variations, were surprisingly small. To secure accuracy, however, it was necessary to suspend work on the approach of a street-car within two blocks, or on the passing of a train a mile distant. In Cambridge these interruptions were not serious; in Boston and in New York it was necessary to snatch observations in very brief intervals of quiet. In every case a single determination of the duration of the residual sound was based on the average of a large number of observations.

An organ-pipe, of the gemshorn stop, an octave above middle *c* (512 vibration frequency) was used as the source of sound in some preliminary experiments, and has been retained in subsequent work in the absence of any good reason for changing. The wind-supply from a double tank, water-sealed and noiseless, was turned on and off the organ-pipe by an electro-pneumatic valve, designed by Mr. Geo. S. Hutchings, and similar to that used in his large church organs. The electric current controlling the valve also controlled the chronograph, and was made and broken by a key in the hands of the observer from any part of the room. The chronograph employed in the later experiments, after the more usual patterns had been tried and discarded, was of special design, and answered well the requirements of the work — perfect noiselessness, capacity to measure intervals of time from a half second to ten seconds with considerable accuracy, and portability. It is shown in the adjacent diagram. The current whose cessation stopped the sounding of the organ-pipe also gave the initial record on the chronograph, and the only duty of the observer was to give the signal when the sound ceased to be audible.

While the supreme test of the investigation lies in the consistency and simplicity of the whole solution as outlined later, three preliminary criteria are found in (1) the agreement of the observations obtained at one sitting, (2) the agreement of the results obtained on different nights and after the lapse of months, or even years, by the same observer under similar conditions, and (3) the agreement of independent determinations by different observers. The first can best be discussed, of course, by the recognized physical methods for examining the accuracy of an extended series of observations; and the result of such examination is as follows: Each determination being the mean of about twenty observations under conditions such that the audible duration of the residual sound was 4 seconds, the average deviation of the single observations from the mean was .11 seconds, and the maximum deviation was .31. The computed "probable error" of a single determination was about .02 seconds; as a matter of fact, the average deviation of ten determinations from the mean of the ten was .03 seconds, and the maximum deviation was .05. The reason for this accuracy will be discussed in a subsequent paper. The probable error of the mean, thus calculated from the deviations of the single observations, covers only those variable errors as likely to increase as to decrease the final result. Fixed instrumental errors, and the constant errors commonly referred to by the term "personal factors" are not in this way exposed. They were, however, repeatedly tested for by comparison with a clock beating seconds, and were very satisfactorily shown not to amount to more than .02 seconds in their

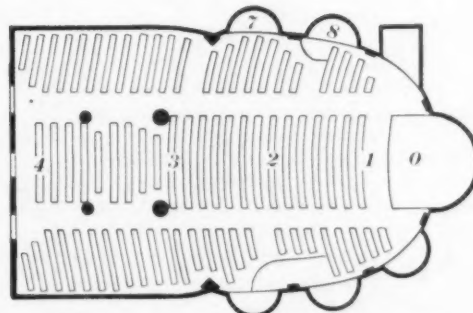
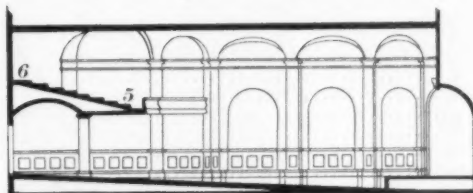


Fig. 2. Steinert Hall, Boston: Position of Air-reservoir and Organ-pipe at O; Positions of Observer 1 — 8.

cumulative effect. Three types of chronographs, and three kinds of valves between the organ-pipe and the wind-chest were used in the gradual development of the experiment, and all gave for the same room very nearly the same final results. The later instruments were, of course, better and more accurate.

<sup>1</sup>A series of papers by Wallace C. Sabine, Assistant-Professor of Physics at Harvard University. Continued from No. 1267, page 5.

The second criterion mentioned above is abundantly satisfied by the experiments. Observations taken every second or third night for two months in the lecture-room of the Fogg Art Museum gave practically the same results, varying from 5.45 to 5.62 with a mean value of 5.57 seconds, a result, moreover, that was again obtained after the lapse of one and then of three years.

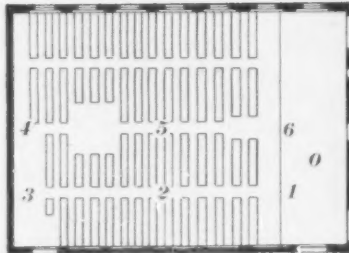
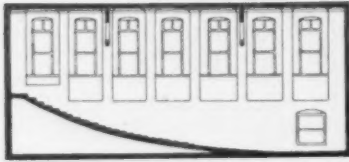


Fig. 3. Lecture-room, Jefferson Physical Laboratory: Position of Observer at O; Positions of Air-reservoir and Organ-pipe 1-6.

Equally satisfactory agreement was obtained at the beginning and at the end of three years in Sanders Theatre, and in the Constant-temperature Room of the Physical Laboratory.

Two gentlemen who were already somewhat skilled in physical observation, Mr. Gifford Le-Clear and Mr. E. D. Densmore, gave the necessary time to test the third point. After several nights' practice their results differed but slightly, being .08 seconds and .10 seconds longer than those obtained by the writer, the total duration of the sound being 4 seconds. This agreement, showing that the results are probably very nearly those

that would be obtained by any auditor of normal hearing, gives to them additional interest. It should be stated, however, that the final development of the subject will adapt it with perfect generality to either normal or abnormal acuteness of hearing, and, therefore, the above agreement by different observers, though interesting, is not in the least essential.

Almost the first step in the investigation was to establish the following three fundamentally important facts. Later work has proved these fundamental facts far more accurately, but the original experiments are here given as being those upon which the conclusions were based.

*The duration of audibility of the residual sound is nearly the same in all parts of an auditorium.*—Early in the investigation an experiment to test this point was made in Steinert Hall, in Boston. The source of sound remaining on the platform at the point marked *o* in the diagram, observations were made in succession at the points marked 1 to 8, with the results shown in the table:—

Stations.	Duration.
1.....	2.12
2.....	2.17
3.....	2.23
4.....	2.20
5.....	2.23
6.....	2.27
7.....	2.20
8.....	2.26

On first inspection these results seem to indicate that the duration of audibility is very slightly greater at a distance from the source, and it would be easy to explain this on the theory that at a distance the ear is less exhausted by the rather loud noise while the pipe is sounding; but as a matter-of-fact, this is not the case, and the variations there shown are within the limits of accuracy of the apparatus employed and the skill attained thus early in the investigation. Numerous later experiments, more accurate, but not especially directed to this point, have verified the above general statement quite conclusively.

*The duration of audibility is nearly independent of the position of the source.*—The observer remaining at the point marked *o* in the diagram of the large lecture-room of the Jefferson Physical Laboratory, the organ-pipe and wind-chest were moved from station to station, as indicated by the numbers 1 to 6, with the results shown in the table:—

Station.	Duration.
1.....	3.90
2.....	4.00
3.....	3.90
4.....	3.98
5.....	3.95
6.....	3.96

*The efficiency of an absorbent in reducing the duration of the residual sound is, under ordinary circumstances, nearly independent of its position.*—Fifty metres of cretonne cloth draped on a scaffolding under the rather low ceiling at the back of the lecture-room of the Fogg Museum, as shown in the adjacent diagram, reduced the audible duration of the residual sound by very nearly the same amount regardless of the section in which it hung, as shown in the following table, the initial duration being 5.57 seconds:—

Section.	Duration.
1.....	4.88
2.....	4.83
3.....	4.92
4.....	4.85

In some later experiments five-and-a-half times as much cretonne draped on the scaffolding reduced the audible duration of the residual sound to 3.25 seconds; and when hung fully exposed in the high dome-like ceiling, gave 3.29 seconds, confirming the above statement.

These facts, simple when proved, were by no means self-evident so long as the problem was one of reverberation, that is, of successive reflection of sound from wall to wall. They indicated that, at least with reference to auditoriums of not too great dimensions, another point-of-view would be more suggestive, that of regarding the whole as an energy problem in which the source is at the organ-pipe and the decay at the walls and at the contained absorbing material. The above results, then, all point to the evident, but perhaps not appreciated, fact that the dispersion of sound between all parts of a hall is very rapid in comparison with the total time required for its complete absorption, and that in a very short time after

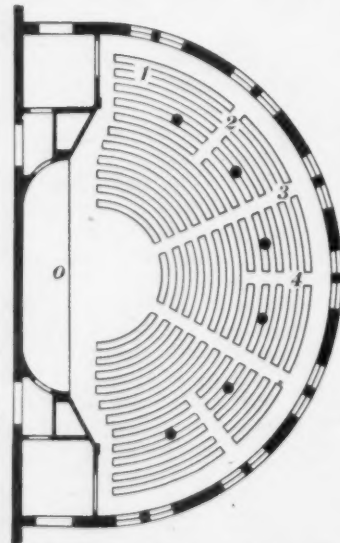
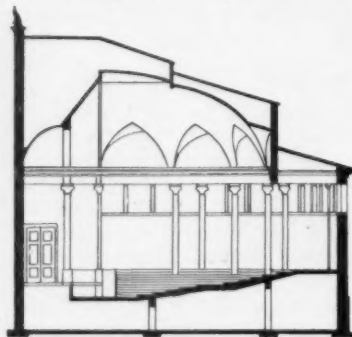


Fig. 4. Lecture-room, Fogg Art Museum: Position of Observer at O; Positions of Absorbent at 1-4, and in the Dome.

the source has ceased the intensity of the residual sound, except for the phenomenon of interference to be considered later, is very nearly the same everywhere in the room.

This much being determined, the investigation was continued in the following manner: Cushions from Sanders Theatre were transferred to the lobby of the lecture-room of the Fogg Museum; a very few were brought into the room and spread along the front row of seats; the duration of audibility of the residual sound, diminished by the introduction of this additional absorbent, was determined, and the total length of cushion was measured. The next row of seats was then covered in the same manner and the two observations made—length of cushion and duration of residual sound. This was repeated till cushions covered all the seats. This work was at first undertaken solely with the intention of determining the relative merits of different absorbing materials that might be placed in the room as a corrective for

excessive residual sound, and the account of this application is given in the introductory paper. A subsequent study of these and similar results obtained in many other rooms has shown their applicability to the accurate determination of the absorbing power of wall-surfaces. This application may be shown in a purely analytical manner, but the exposition is greatly helped by a graphical representation. The manner in which the duration of the residual sound in the Fogg

Lecture-room is dependent on the amount of absorbing material present is shown in the following table:—

Length of Cushion in Metres.	Duration of Residual Sound in Seconds.
0.....	5.61
8.....	5.33
17.....	4.49
28.....	4.56
44.....	4.21
63.....	3.94
83.....	3.49
104.....	3.33
128.....	3.00
146.....	2.85
162.....	2.64
180.....	2.36
213.....	2.33
242.....	2.22

This table, representing graphically in the conventional manner—length of cushion plotted horizontally and duration of sound vertically—gives points through which the curve may be drawn in the accompanying diagram. To discover the law from this curve we represent the lengths of cushion by  $x$ , and the corresponding durations of sound, the vertical distances to the curve, by  $t$ . If we now seek the formula connecting  $x$  and  $t$ , that most nearly expresses the relationship represented by the above curve, we find it to be  $(a+x)t=k$ , which is the familiar formula of an equilateral hyperbola with its origin displaced along the axis of  $x$ , one of its asymptotes, by an amount  $a$ . To make this formula most closely fit our curve we must, in this case, give to the constant  $a$  the numerical value 146, and to  $k$  the value 813. The accuracy with which the formula

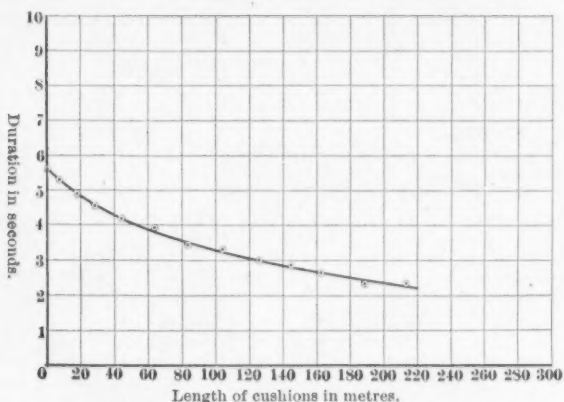


Fig. 5. Curve showing the relation of the Duration of the Residual Sound to the added absorbing material.

represents the curve may be seen by comparing the durations calculated by the formula with those determined from the curve; they nowhere differ by more than .04 of a second, and have, on an average, a difference of only .02 of a second. This is entirely satisfactory, for the calculated points fall off from the curve by scarcely the breadth of the pen-point with which it was drawn.

The determination of the absorbing power of the wall-surface depends on the interpretation of the constant  $a$ . In the formula, the position of  $a$ , indicating that  $x$  is to be added to it, suggests that  $x$  and  $a$  are of a like nature, and that  $a$  is a measure of the absorbing power of the bare room, which, in order to determine the curve, was increased by the introduction of the cushions. This is even better shown by the diagram in which the portion of the curve experimentally determined is fitted into the curve as a whole, and  $a$  and  $x$  are indicated. Thus, the absorbing power of the room—the walls, partly plaster on stone, partly plaster on wire-lath, the windows, the skylight, the floor—was equivalent to 146 running metres of Sanders Theatre cushions.

The last statement shows the necessity for two subsidiary investigations. The first, to express the results in some more permanent, more universally available, and, if possible, more absolute unit than the cushions; the other, to apportion the total absorbing power among the various components of the structure.

The transformation of results from one system of units to another necessitates a careful study of both systems. Recently some experiments in which the cushions were placed with one edge pushed against the backs of the settees gave results whose anomalous character suggested that, perhaps, their ab-

sorbing power depended not merely on the amount present but on the area of the surface exposed. It was then recalled that about two years before, at the beginning of an evening's work, the first lot of cushions brought into the room were placed on the floor, side by side, with edges touching, but that after a

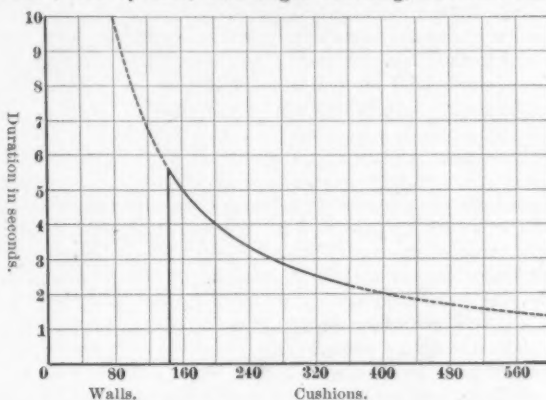


Fig. 6. Curve 5 plotted as part of its corresponding equilateral hyperbola. The solid part was determined experimentally; the displacement of this to the right measures the absorbing power of the walls of the room.

few observations had been taken the cushions were scattered about the room, and the work was repeated. This was done not at all to uncover the edges, but in the primitive uncertainty as to whether near cushions would draw from each other's supply of sound, as it were, and thus diminish each other's efficiency. No further thought was then given to these discarded observations until recalled by the above-mentioned discrepancy. They were sought out from the notes of that period, and it was found that, as suspected, the absorbing power of the cushions when touching edges was less than when separated. Eight cushion had been used, and, therefore, fourteen edges had been touching. A record was found of the length and the breadth of the cushions, and, assuming that the absorbing power was proportional to the area exposed, it was possible to calculate their thickness by comparing the audible duration of the residual sound in the two sets of observations; it was thus calculated to be 7.4 centimetres. On stacking up the same cushions and measuring their total thickness, the average thickness was found to be 7.2 centimetres, in very close agreement with the thickness estimated from their absorption of sound. Therefore, the measurements of the cushions should be, not in running metres of cushion, but in square metres of exposed surface.

For the purposes of the present investigation, it is wholly unnecessary to distinguish between the transformation of the energy of the sound into heat and its transmission into outside space. Both shall be called absorption. The former is the special accomplishment of cushions, the latter of open windows. It is obvious, however, that if both cushions and windows are to be classed as absorbents, the open window, because the more universally accessible and the more permanent, is the better

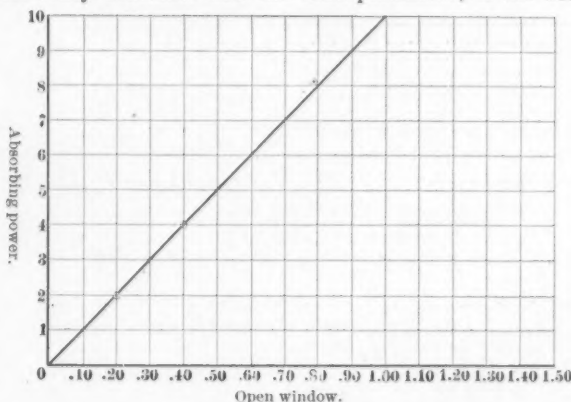


Fig. 7. The absorbing power of open windows plotted against the areas of the openings, showing them to be proportional.

unit. The cushions, on the other hand, are by far the more convenient in practice, for it is possible only on very rare occasions to work accurately with the windows open, not at all in summer on account of night noises—the noise of crickets and other insects—and in the winter only when there is but the

slightest wind; and further, but few rooms have sufficient window-surface to produce the desired absorption. It is necessary therefore, to work with cushions, but to express the results in open-window units.

Turning now to the unit into which the results are to be transformed, an especially quiet winter night was taken to determine whether the absorbing power of open windows is proportional to the area. A test of the absorbing power of seven windows, each 1.10 metres wide, when opened .20, .40, and .80 metres, gave results that are plotted in the diagram. The points, by falling in a straight line, show that, at least for moderate breadths, the absorbing power of open windows, as of cushions, is accurately proportional to the area. Experiments in several rooms especially convenient for the purpose determined the absorbing power of the cushions to be .80 of that of an equal area of open windows. These cushions were of hair, covered with canvas and light damask. "Elastic Felt" cushions having been used during an investigation in a New York church, it was necessary on returning to Cambridge to determine their absorbing power. This was accomplished through the courtesy of the manufacturers, Messrs. Sperry & Beale, of New York, and the absorbing power was found to be .73 of open-window units — an interesting figure, since these cushions are of frequent use and of standard character.

Hereafter all results, though ordinarily obtained by means of cushions, will be expressed in terms of the absorbing power of open windows — a unit as permanent, universally accessible, and as nearly absolute as possible. In these units the total absorbing power of the walls, ceiling, floor, windows and chairs in the lecture-room of the Fogg Museum is 75.5.

Next in order is the apportionment of the total absorbing power among the various components of the structure. Let  $s_1$  be the area of the plaster on tile, and  $a_1$  its absorbing power per square metre;  $s_2$  and  $a_2$  the corresponding values for the plaster on wire lath;  $s_3$  and  $a_3$  for window-surface, etc. Then

$$a_1 s_1 + a_2 s_2 + a_3 s_3 + a_4 s_4, \text{ etc.} = 75.5$$

$s_1, s_2, s_3, \text{ etc.}$ , are known, and  $a_1, a_2, a_3, \text{ etc.}$  — the coefficients of absorption — are unknown, and are being sought. Similar equations may be obtained for other rooms in which the proportion of wall-surface of the various kinds is greatly different, until there are as many equations as there are unknown quantities. It is then possible by elimination to determine the absorbing power of the various materials used in construction.

Through the kindness of Professor Goodale, an excellent opportunity for securing some fundamentally interesting data was afforded by the new Botanical Laboratory and Greenhouse recently given to the University. These rooms — the office, the laboratory and the greenhouse — were exclusively finished in hard-pine sheathing, glass, and cement; the three rooms, fortunately, combined the three materials in very different proportions. They and the Constant-temperature Room in the Harvard Physical Laboratory — the latter being almost wholly of brick and cement — gave the following data:

	Area of Hard-pine Sheathing.	Area of Glass.	Area of Brick and Cement.	Combined Absorbing Power.
Office.....	127.	7	0	8.37
Laboratory.....	84.8	6	30	5.14
Greenhouse.....	12.7	80	85	4.64
Constant-temperature room..	2.1	0	124	3.08

This table gives for the three components the following coefficients of absorption: hard-pine sheathing .058, glass .024, brick set in cement .023.

WALLACE C. SABINE.

[To be continued.]

## A DAY AT WINCHESTER.



Incandescent Lights.

ONE'S ninth voyage across the Atlantic does not present quite the same interest as the first, but no two voyages are exactly alike, and it is generally possible to improve the mind in some way in the intervals of one's corporal convulsions. On this occasion, there was a certain pleasure in observing the Germans, who formed almost the entire society on the ship. Even a seasick passenger could appreciate the cheerful "goot moarn" with which those of his companions whose English vocabulary extended no farther endeavored to raise his spirits, and to me, at least, the friendly solicitude with which our steward, who had probably remarked my frequent absence from the

dinner-table, observed, "This is *schwer* for the *magen*, Mr. C —" as he offered me the plum-pudding, was much more grateful than the everlasting, "Yes, sir; thank you, sir!" of the English servants.

Landing at Southampton early in the morning, there was plenty of time before the midnight boat to Havre for a trip into the country; and having been several times at Salisbury, which is the place that Americans usually choose on such occasions, I concluded to try Winchester, which is at about the same distance, and possesses, beside the cathedral, of which I had only seen the outside, the great school, in regard to which every one brought up on English story-books must have some curiosity. The Winchester Station, as is, for some mysterious reason, generally the case in England, is at the extreme edge of the town, or, rather, the two stations, one on the South-western, and the other on the Great-western, are on opposite edges, all the interesting objects being between them. However, as the town is not large, and I had plenty of time, this was not a great disadvantage. On the whole, Winchester seemed to me a more interesting place than Salisbury. Of course, Salisbury offers, with its unrivalled cathedral, the beautiful houses around the Close, and the walks and drives in the vicinity, a greater variety of attractions than Winchester; but Salisbury town is too prosperous and bustling, and even the cathedral enclosure is kept too neatly polished-up for visitors, to have very much picturesque charm; while Winchester does not seem to be expecting any visitors, but to be content with looking after its own affairs in its own way. Its own way, too, is a very pretty one. Whatever we may think about the British Empire and Colonial Secretaries, and suzerainties and such things, and however our ribs may ache at the recollection of the impact of British elbows, it will be long before the American heart fails to respond in some degree to the impression of modest refinement which so many things in southwestern England — the sweet, clear voices of the people, the neatness and pretty surroundings of the houses, and, perhaps, a certain pervading air of simplicity, help to produce. Walking down the High Street, I saw a card in a shop-window, on which was inscribed:

"£1 REWARD!  
ANY ONE GIVING INFORMATION WHICH SHALL LEAD TO THE  
CONVICTION OF THE  
PERSON OR PERSONS  
WHO  
THREW A SHEEP  
INTO  
THE COLLEGE BATHS  
ON FRIDAY NIGHT LAST  
SHALL RECEIVE THE ABOVE REWARD!"

Nothing could have been more innocent, or, in fact, more creditable, than this public announcement of the griefs of the college authorities, and their desire for justice, but there was a gentle *naïveté* about it which was not only English but delightful.

The interior of the cathedral is so exactly like the photographs that it does not take long to get a satisfactory superficial view, at least; but the outside, and, indeed, the Close generally, offers many interesting bits of detail. Not to mention the Norman arcade, which has, somehow, an uncomfortable air of having been rebuilt, there are various neglected old cusped arches, with good mouldings, apparently belonging to the cloister, but now half buried in the earth, and utilized as a shelter for the gardener's tools; and here and there in other directions, bits of wall, covered with ivy, tempt the amateur archaeologist to investigation. I remember my satisfaction, on my first visit to Salisbury, at finding, built into the wall of the Close, many stones with Norman ornaments cut on them, which undoubtedly came from the earlier building at Sarum; and, since then, the sight of a thirteenth-century building always leads me to look for fragments of still earlier date.

The college buildings at Winchester are hardly worthy of the cathedral, although some portions of them must, I suppose, date from William of Wykeham's time. The work is generally cheap, of flint rubble, with quoins and arches of cut-stone, but even with these it would have been possible to get some good effects. The quadrangles are arranged in nearly the same way as at Oxford, but they are smaller, and quite numerous; and, as at Oxford, portions of the college group are of more recent date, generally in the heavy George-the-Fourth style. The recent buildings in Winchester did not attract me greatly. I must confess that the modern imitation of English-Gothic leaves me rather cold, and, as is natural in a cathedral town, there is a good deal of it; but the un-English modern Gothic is, at least, a great deal worse. The most conspicuous example of this is the town-hall. If I am not mistaken, this was rather a famous building in the day of the Gothic Revival, and the tympanum of the arches in the principal story filled, as to the upper portion, with masses of ape-like figures à la Moissac, somehow brought up in my recollection a burst of enthusiasm in the English professional journals of the polychromatic period. However that may be, the building looks ugly enough now. The more or less central tower, forming a long rectangle in plan, bursting through the roof, and expanding above into a group of angle-turrets; the mansards at the ends of the wings, which the last generation supposed to be Gothic; the iron fences, to soothe the transition between the sky and this pearl of human art, — all these brought up memories of the strange architectural epidemic which flourished so violently, and vanished so quickly and so completely. The most

astonishing thing about the building now is really its ugliness. I climbed the steep hill to the north of the town to get a photograph of the cathedral from a distance; but found that I could not get the cathedral without the town-hall, and preferred to give up the cathedral, rather than include the other. C.

ENGLISH FURNITURE.<sup>1</sup>— II.Detail from the Statue of Danton, Paris. From *La Semaine des Constructeurs*.

AS I purpose returning to this part of the subject, I will pass on very rapidly to consider the reason why from the time of Sheraton there was such a universal degradation of all the applied arts in England during the first half of the nineteenth century. The great poverty and distress caused by the long Napoleonic war, as also the political unrest which almost resulted in a rebellion, may be mentioned as factors in this, but the principal reason was the enormous development of the machine industry, which brought in its train a rampant utilitarianism. The state of artistic industry in this country was at the lowest point of degradation during these years. As furniture and decoration were no longer objects of beauty, art-patrons (apart from collectors) could only gratify their taste by the purchase of pictures. Painting at this period was synonymous with art, and the age of Turner and Constable, of Wilkie and Etty produced furniture designs for which, as seen in old catalogues, are veritable nightmares. The dry bones, however, began to be stirred, and Pugin and his coadjutors, by bringing about the Gothic revival, began what we must hope to be a lasting improvement in the public taste. It is true that what Pugin accomplished was a mere galvanizing of the dead mediævalism which is impossible with modern conditions of life, but the revolt he led against the abominations of the time was invaluable. He cannot be justly called a great architect, but he accomplished what a great architect might have failed to do. The Gothic domestic furniture produced during the period from the rebuilding of the Palace at Westminster to that of the New Law Courts, which I take to be time covered by the Gothic revival, though cumbersome, generally over-elaborate and expensive, at any rate brought us back to the first principles of construction and directness of design.

The Great Exhibition of 1851, though showing some improvement here and there on the furniture produced in the thirties, was held before the new movement had had time to be of much effect, and to judge by the illustrations of it which are now accessible, the furniture and fittings shown had the common fault of nearly all exhibition pieces, of needless elaboration combined with poverty of design. Since the Gothic revival died its death, the history of furniture in England was for many years nothing but a series of ill-considered revivals of a miscellaneous past. It is cheering, however, to see that, having run through a cycle of copying and combining, our designers are beginning to invent by evolution from Classic models. To be successful this must be warily done with a reverent eye on the past, and without attempting to avoid the commonplace by rushing into the vulgarity of the bizarre and eccentric.

I do not mean that designers should allow themselves to be too much hampered by prescription and tradition, but that the examples of the best periods should always be kept in view, and the principles which underlie those examples firmly held.

If I have understood aright the teachings of the great art critic and teacher who has just passed away, I should say that our text and motto in furniture manufacture, as in every other of the arts of life, should be utility before all, but æsthetic utility. Furniture is not made primarily to be looked at, but to be used. Better a Windsor chair with comfort than a *chaise à la Louis Quinze* which makes one's back ache. Let every part have its meaning and fulfil its purpose. Doors that will open and shut, drawers that will work smoothly, handles that can be held — truisms if you will, but truisms not always recognized in practice. Utility, which means fitness, is in itself beauty if rightly understood, but man, being born of woman, is under an inherent necessity to decorate. The plainest piece of furniture devoted to the humblest office can properly receive ornament of some kind. A heavy kitchen-table or dresser with a 2-inch top can be made to look lighter and more pleasing by a simple bead or chamfer, without weakening the construction in appearance or

reality, but decoration should never be purposely constructed. Form, by which I mean the general outline of a piece of furniture, should be always perfect in itself, and should primarily be independent of decoration, and if the cabinet, the table, or the chair does not look well before the ornament is added, no ornament subsequently applied will correct the first error. Good outline and good proportion are both necessary to produce excellence in form, and in good proportion there should always be a dominant mass to which the other parts are subsidiary, and to which the eye constantly returns. It is needless to say how all great painters, architects and designers have kept this principle in view. The subsidiary parts again should constantly vary (not too sharply, for the more subtle the proportions the more pleasing), for the whole art of composing or putting together the several parts consists in varying well and intelligently. It is quite true that composition cannot be taught. Ruskin has well observed that one may as well endeavor to teach how to be witty; but this can be learned: that there are certain rules which have never been violated by the great masters of design, and these afford tests by which good work can be known and appreciated. Closely connected with the theory of good proportion and form are those principles of sound construction which have obtained in every good period of art, and which are not difficult to learn from the examples of the past. The proper main lines for good woodwork are the perpendicular and the horizontal. The curved line is only admissible as an adjunct to these, and should always be subordinate. An unornamented piece of furniture composed wholly of straight lines may be yet quite satisfactory to the eye, but one entirely composed of curves can never be so, though decorated with the utmost skill and refinement of detail. It is an axiom of good construction that whatever the material used, it should be as far as possible homogeneous, and in the case of woodwork recourse should be had as little as possible to metal and glue. In a damp climate especially, screws and iron straps and angle-irons rust, and glue softens and decays. The tenon and mortise, the dovetail, and the other real joints should be relied on. Each surface should absolutely fit, so that the least possible film of glue be employed. Not only are the joints necessarily stronger, but the glue is more effectually protected from the air. Too great a use is made by cabinet-makers, especially in chair-frames, of the dowel, which is always a weak joint in comparison, though it is true that they are sometimes driven to its use by bad designs. I may also mention that dovetails are nearly always made with too great a slope, which weakens the cross strain without increasing the lateral strength of the joint. Pins through tenons should always be of wood.

The abuse of mouldings is a fruitful source of failure to produce good woodwork. A surface of plain wood of large size must necessarily not only have a bare and uninteresting appearance, but be liable to warp and split under differences of heat and moisture, and for this defect the invention of the panel was an obvious remedy.

The square edge of the framing "stile," it was found, made too abrupt a transition with the panel, and the chamfer was the result. This grew afterwards into the moulding, by breaking the material from one level to the other, by a series of rounds and hollows, etc. In strictness, therefore, the level of the moulding should not rise above the stile. To rigidly observe a hard-and-fast rule of this kind, however, would be pedantic, and, like many other general maxims, can sometimes be violated with advantage, a projecting moulding, when intelligently employed, often giving vigor and character, especially in work on a large scale. When not kept within due bounds, however, the effect is often deplorable. Some Italian and French and even German work exists, and has been copied of late years in this country, where every detail is overpowered by the moulding, which, being of excessive width and height, form panels bewildering in their number and the oddity of their shapes, until the absurdity reached a climax in certain joinery-work produced a few years ago, in which the mouldings were fixed, crossing the panels saltire-wise, from corner to corner. Mouldings employed on the shelf and cornice are in a different category, their use being, of course, to lighten the effect of a thick square edge. Even here, however, we often see the effect frittered away by excess of carving, and sometimes by a violation of the rule that every ogee curved member of the moulding, whether ogee or ovolo, should have its angle to balance it. In work of the best schools, mouldings are very slightly curved, if at all.

The art of the carver being nearly allied to that of the sculptor, and, therefore, standing on a higher plane than that of the other craftsman connected with working in wood, has always had a tendency to transgress its due bounds, and to assert itself in a manner incompatible with its proper sphere of mere decoration.

The desire of the artist to display his skill in fine modelling and cutting, and his knowledge of anatomy and of various styles of ornament, has constantly been productive of results which, though gratifying to himself and perhaps to his patrons at the time, have been fatal to the true artistic balance of effect in the piece of furniture so decorated. Some of the ornate cabinets, tables, and chairs, produced by the Italians during the past three centuries, have more the appearance of strange and wonderful specimens of carving than the individual and useful pieces of furniture whose names they bear. The ornament is everything, the usefulness of furniture nothing, and this I take to be about the worst that can be said of any thing of which the chief object is utility.

The French and Germans, and, indeed, every nation, have also been sinners in this respect, though much less so than the Italians.

[To be continued.]

<sup>1</sup>A paper by Lasenby Liberty, J. P., read before the Society of Arts, and printed in the *Journal* of the Society. Continued from No. 1268, page 16.

## ILLUSTRATIONS

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

A COMPETITIVE DESIGN FOR THE NEW YORK STOCK EXCHANGE: BROAD-STREET FRONT. MR. GEORGE KRAMER THOMPSON, ARCHITECT, NEW YORK, N. Y.

SECTION AND NEW-STREET ELEVATION OF THE SAME.

EMPIRE ROOM: HOUSE OF ISAAC ROSENWALD, ESQ., NEW YORK, N. Y. MESSRS. BRUN & HAUSER, ARCHITECTS, NEW YORK, N. Y.

PARLOR IN THE SAME HOUSE.

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

MONUMENT TO ALPHAND, AVENUE DU BOIS DE BOULOGNE, PARIS, FRANCE. M. FORMIGÉ, ARCHITECT; M. DALOU, SCULPTOR.

This plate is copied from *L'Architecture*.

[Additional illustrations in the International Edition.]

HOUSE OF ISAAC ROSENWALD, ESQ., NEW YORK, N. Y. MESSRS. BRUN & HAUSER, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

STATUE OF BARON DE KALB, ANNAPOLIS, MD. MR. EPHRAIM KEYSER, SCULPTOR.

[Gelatine Print.]

COURTYARD OF THE OLD ROYAL MINT, MUNICH, BAVARIA.

[Gelatine Print.]

"LEUTONHURST," NOTTINGHAM, ENG. MR. ARTHUR MARSHALL, ARCHITECT.

"FERNLEIGH," NOTTINGHAM, ENG. MR. ARTHUR MARSHALL, ARCHITECT.

HOUSE AT PUTNEY, ENG. MR. ERNEST E. FETCH, ARCHITECT.

DRAWING-ROOM AND STAIRCASE-HALL IN SAME HOUSE.

## NOTES AND CLIPPINGS

FRESH EXCAVATIONS IN THE FORUM.—The excavations in the Roman Forum have been progressing with remarkable activity, and while provisions have been made for setting up again the pedestals, columns, votive altars, and other fragments so far as it may be possible to preserve them, the earth is searched through with the greatest care and articles of great value have been found where least expected, writes Oscar Durante from Rome to the *Chicago Tribune*. In the *domus publica* (municipal hall) and the tombs of the Vestals, in the site of which an excavation has been recently made, there has been found a network of sewers. The excavations have also given confirmatory proof of the fact that after the famous fire ordered by Nero the House of the Vestal Virgins was to a great extent reconstructed, and that subsequent partial reconstructions and restorations were carried out after later fires and earthquakes. It seems that in the Middle Ages the House of the Vestal Virgins continued to be made use of for a purpose not clearly proved during the former excavations. During the diggings to the right of the Palatine a few days ago was turned up a magnificent marble-paved floor in varied colorings, certainly of the time of Nero, and the thin partition which served for walling up an old doorway being broken through there came to light a corridor the partitions of which still retain the white plastering painted in their oblique bands, attaching green leaflets and red flowers, with here and there variegated birds with long beaks, capped with small crests of feathers curled backward. Toward the middle of the corridor was a trap-door entrance to a cave, partly opened by fissures of a landslide. Nature had filled it with loose earth, whereon lay a heap of gold coins, evidently hidden by someone who, going down by the step-descent into the subterranean cave, had concealed them in a covering that was not lasting and of which no trace remained. A simple washing was sufficient to clear off the earth's corrosion, and then the coins, 397 in number, were found to weigh in all 1778 grammes. They may be classified as follows: One of the Emperor

Constantius II; seven of the Emperor Valentinian III; two of the Emperor Livius Severus; eight of the Emperor Martianus; three hundred and forty-five of the Emperor Artemius; ten of the Empress Euphemia; twenty-four of the Emperor Leo I. The coins are in a fairly good state of preservation, although somewhat worn through use. The gold of which they are formed is almost pure, containing, as has been proved by analysis, but .012 to .015 of copper or silver alloy. The Temple of Antoninus Pius has now been uncovered from its coating of earth and mold. This is a temple that in its stupendous and majestic ruins recalls the Athenian Parthenon. At the temple's base may now be traced for a considerable distance the ancient Sacred Way up to the foot of the famous sacellum, where were guarded the sacred arms of Mars.

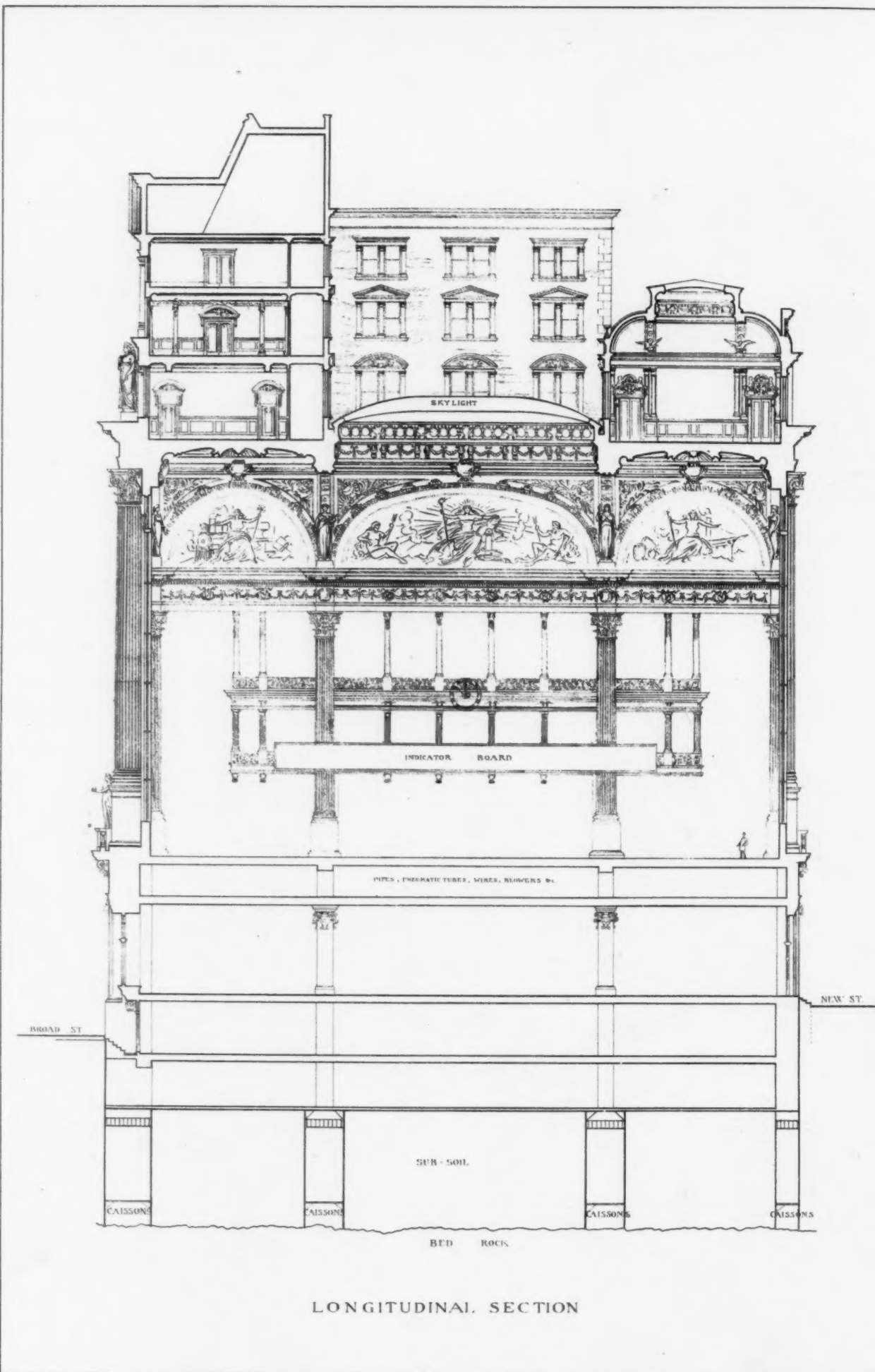
THE SO-CALLED PALACE OF CARDINAL WOLSEY.—The picturesque plaster-fronted house facing Chancery Lane, in Fleet Street, erroneously described by the occupier as "formerly the palace of Cardinal Wolsey and Henry the Eighth," is to be preserved and maintained by the joint action of the London County Council and the City Corporation. In the general widening of Fleet Street, on the south side, it has been arranged that the ground-floor only of this building shall be set back to the line of the street improvement, the upper floors remaining in their present positions, and being supported on cantilevers. The front of the house is to be restored to its original condition, the false front being removed, and the back portion of the premises, which has already been demolished, rebuilt. The price asked for the freehold is £20,000, and the cost of rebuilding and incidental expenses will be £7,300. Thus the total outlay will be £27,300. The scheme of preservation will cost the Council, on an average, £172 a year for 59 years, after which period the premises will be free of charge. This allows for the historic room on the first floor being reserved for the public benefit, and it is anticipated that a considerable portion of the annual charge of £172 may be recouped by letting the room to various archaeological and similar societies on terms which will preserve it for public inspection, and keep it free from damage. The house, although never seen by Wolsey or bluff King Hal, has a notable past, for it was built in the reign of James I., about the year 1610, for Henry, Prince of Wales, as an officer of the Duchy of Cornwall. It continued to be used as offices of the Duchy, at least, until the death of the Prince in 1612, but not long afterwards it was converted into a tavern, and has since been used for business purposes. The ceiling of the room on the first floor has been described as the finest remaining *in situ* in London, and the wood panelling contains some very good carving. It has been found that the present front of the house, as seen from the street, is merely a screen, and that some twenty inches behind it, on the first floor, the original front is imbedded. The old carved pilasters, which were on this front, are still in existence. — *Building News*.

THE HEIGHT-LIMIT LAWS OF ANCIENT ROME.—A writer in the *Central Law Journal*, having stated that Lanciani, the Roman archaeologist, has shown that a law was passed in Rome in the time of the Cæsars restricting the height of fronts of buildings to 60 feet, it may be noted for the benefit of those interested, that this is a "fact well known of old," as appears from Tac. Ann. XV., 43, Lipsius de Mag. Rom. 1-111, C. 4, and Prentice's "Police Powers," pp. 236, 237, n. 2. Augustus, Trajan, and Nero, it appears, all regulated the height of buildings, Augustus fixing the height at 70 feet, Trajan at 60 feet, and Nero, supposedly taking Trajan's height. Nero, however, it may not be amiss to recall, is more frequently thought of as levelling buildings, rather than restricting their height. In the above-mentioned note 2, p. 236 of "Police Powers," is also an interesting description of the character of and rules relating to the plebeian habitations in Rome, termed *insulae*, which were tenement-houses similar in description to the New York tenement-houses. This information on the subject of the Roman laws restricting the height of buildings is interesting, and the writer of this column is still curious to know what the local Building Commissioners of Rome and the various art-societies of those days did or tried to do to the builders who, it is said, managed to evade the law by making the fronts of the buildings only 60 feet as required, and then adding several stories to the rear portion. — *N. Y. Evening Post*.

BROOKLYN INSTITUTE BUYS THE TISSOT COLLECTION.—The Brooklyn Institute has secured possession of the Tissot collection of paintings, representing incidents in the life of Christ. The amount publicly subscribed for the purchase of the collection was only two-thirds of the sum necessary, but the immediate ownership of the collection has been made possible by several gentlemen who have agreed to advance the money to enable the Institute to secure the pictures, retaining a lien on them for the amount of money advanced. This lien, which amounts to about \$20,000, will be paid off with money to be subscribed. The price of the collection was \$60,000. It would be interesting to know whether this \$60,000 plus the entrance-fee which the artist has profited by from the many exhibitions of this collection in different cities, has finally brought him what he considers a fair return for the many years' labor he put into these fascinating little drawings. It would also be interesting to know whether, if the collection had been sold piecemeal, more than \$60,000 would not have been the result of such sale.

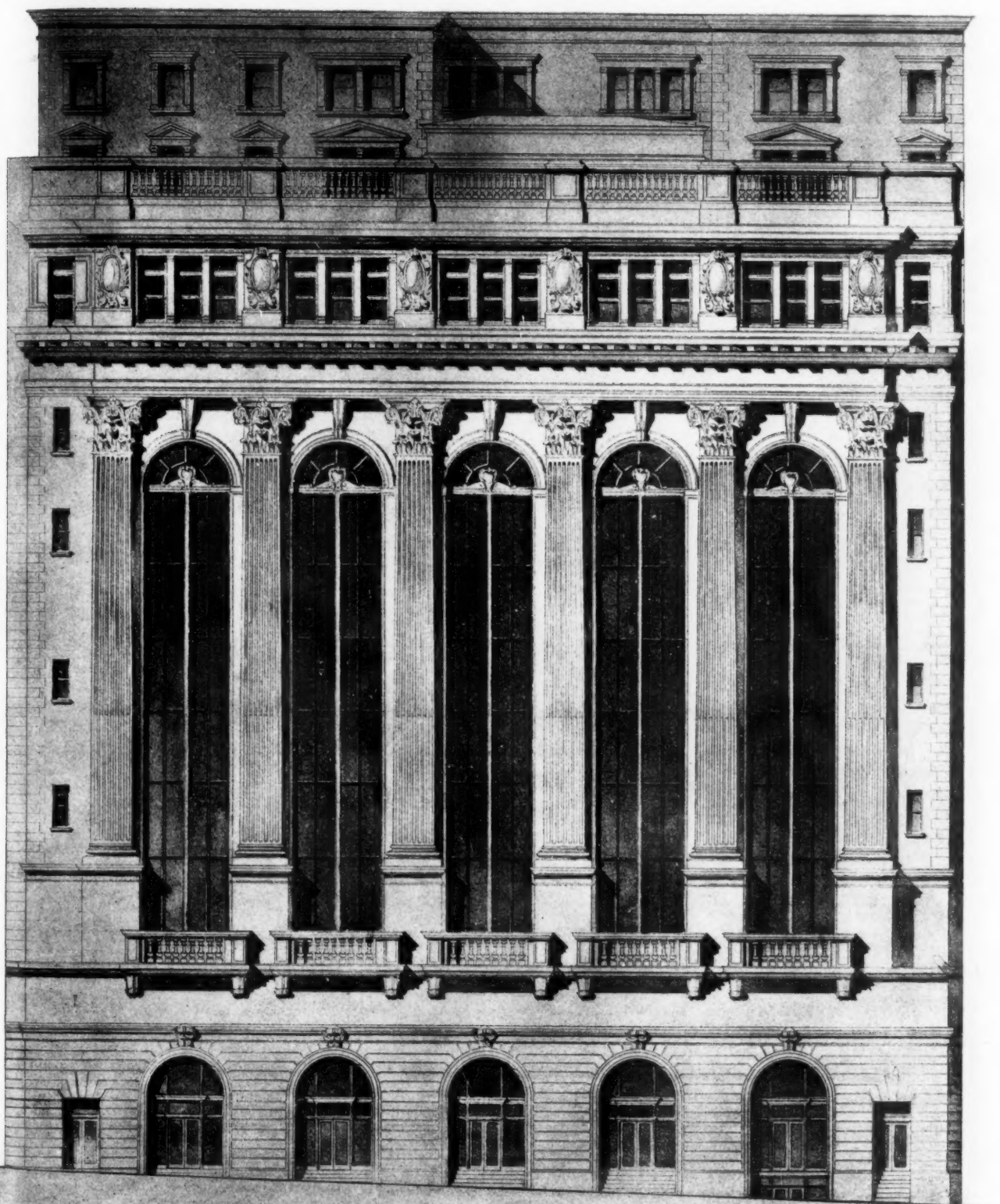
RUINS OF ANOTHER ANCIENT MEXICAN CITY FOUND.—A dispatch from Oaxaca, Mexico, says another ancient city, covering several hundred acres, has been discovered near the Indian village of Teocaltiche in that State. The ruins are almost completely covered with earth, but the excavations so far made show that the discovery is of great archaeological importance. The ruins are on two hills; one is called Cerro de Los Antiguos, the hill of the ancients; the other is El Cerro Encantado, the enchanted hill, and around them flows a rivulet called El Tesoro, the treasure. The hill of the ancients is a natural formation, the enchanted hill being artificial. — *N. Y. Times*.

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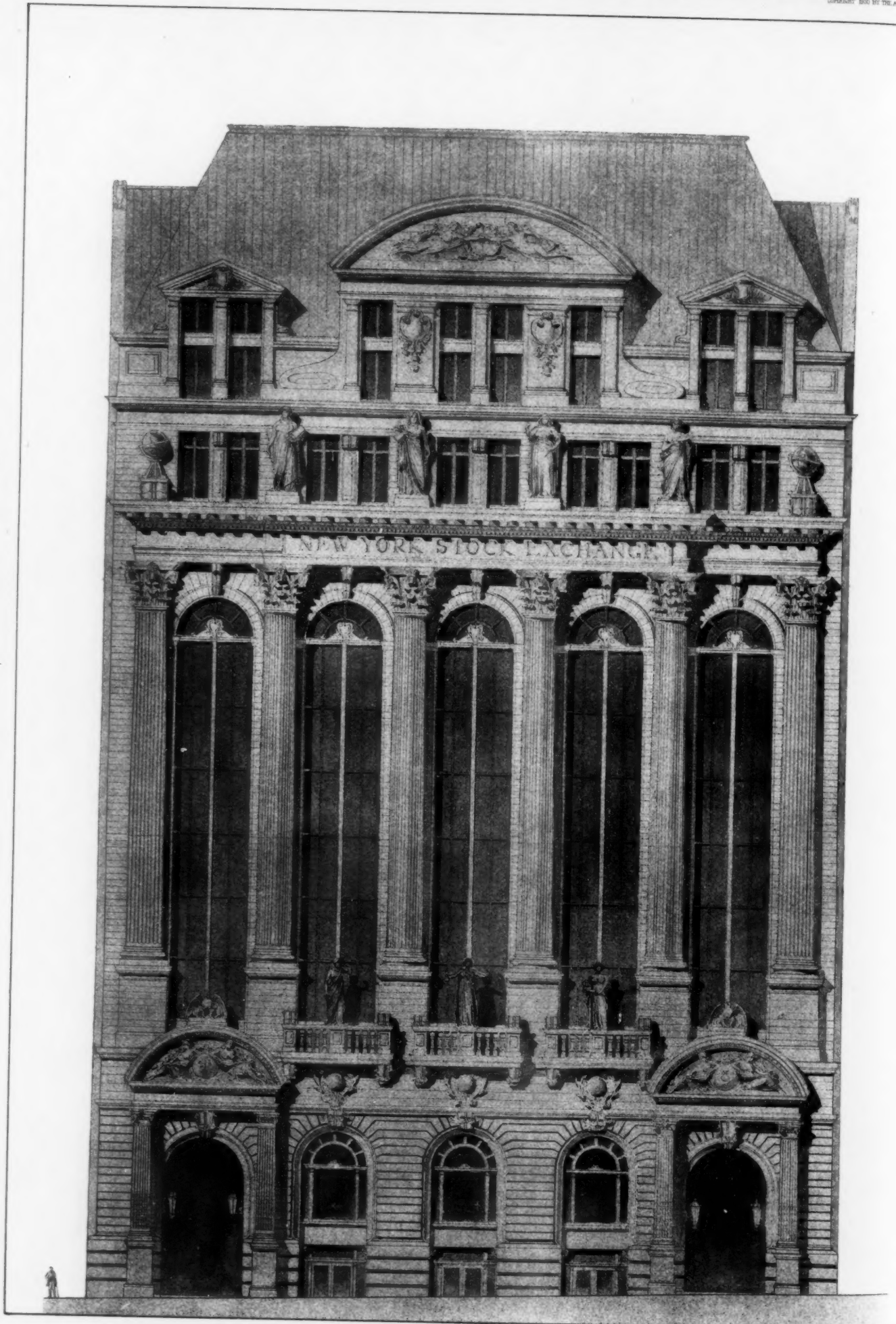


ELEVATION ON NEW STREET

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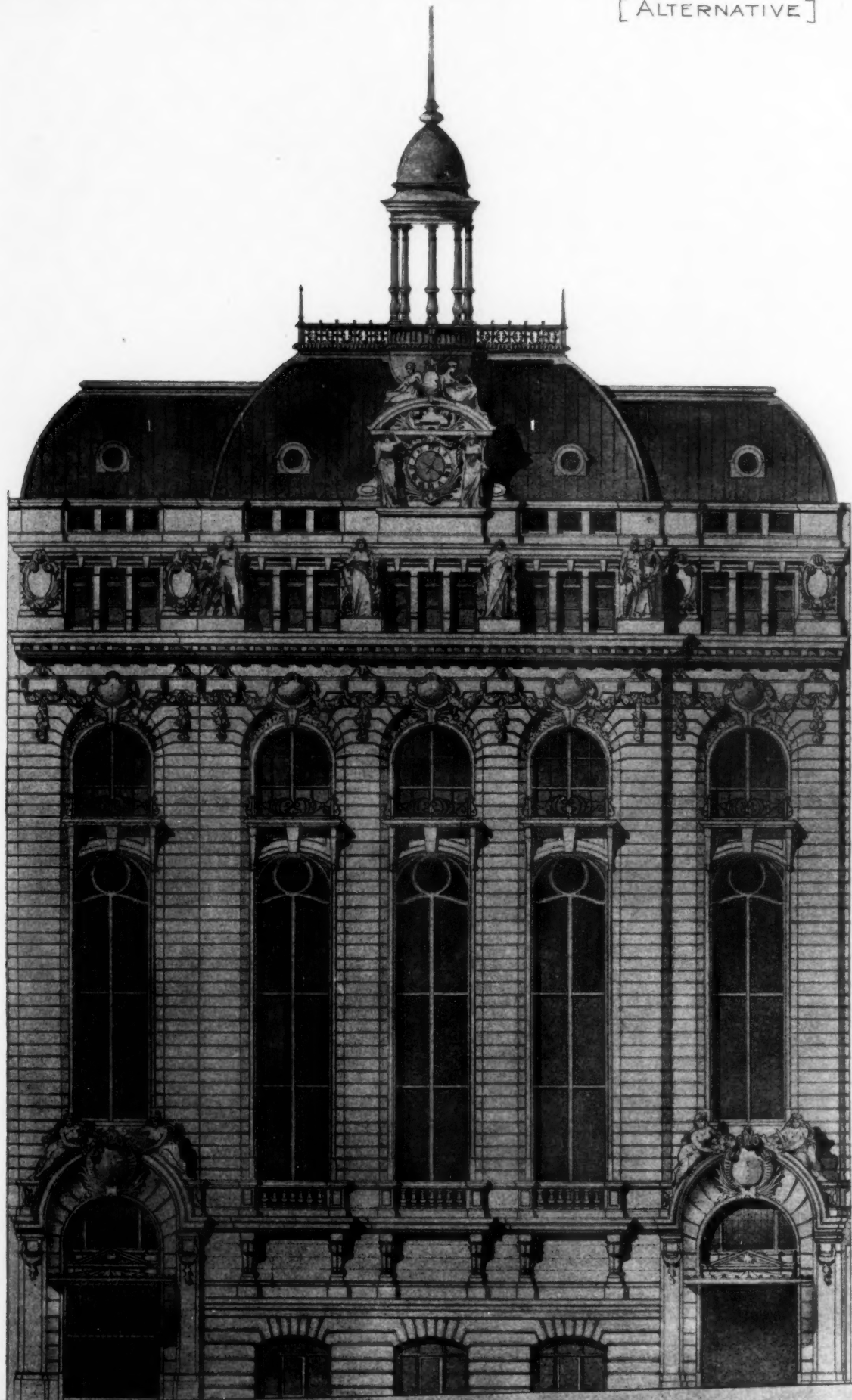
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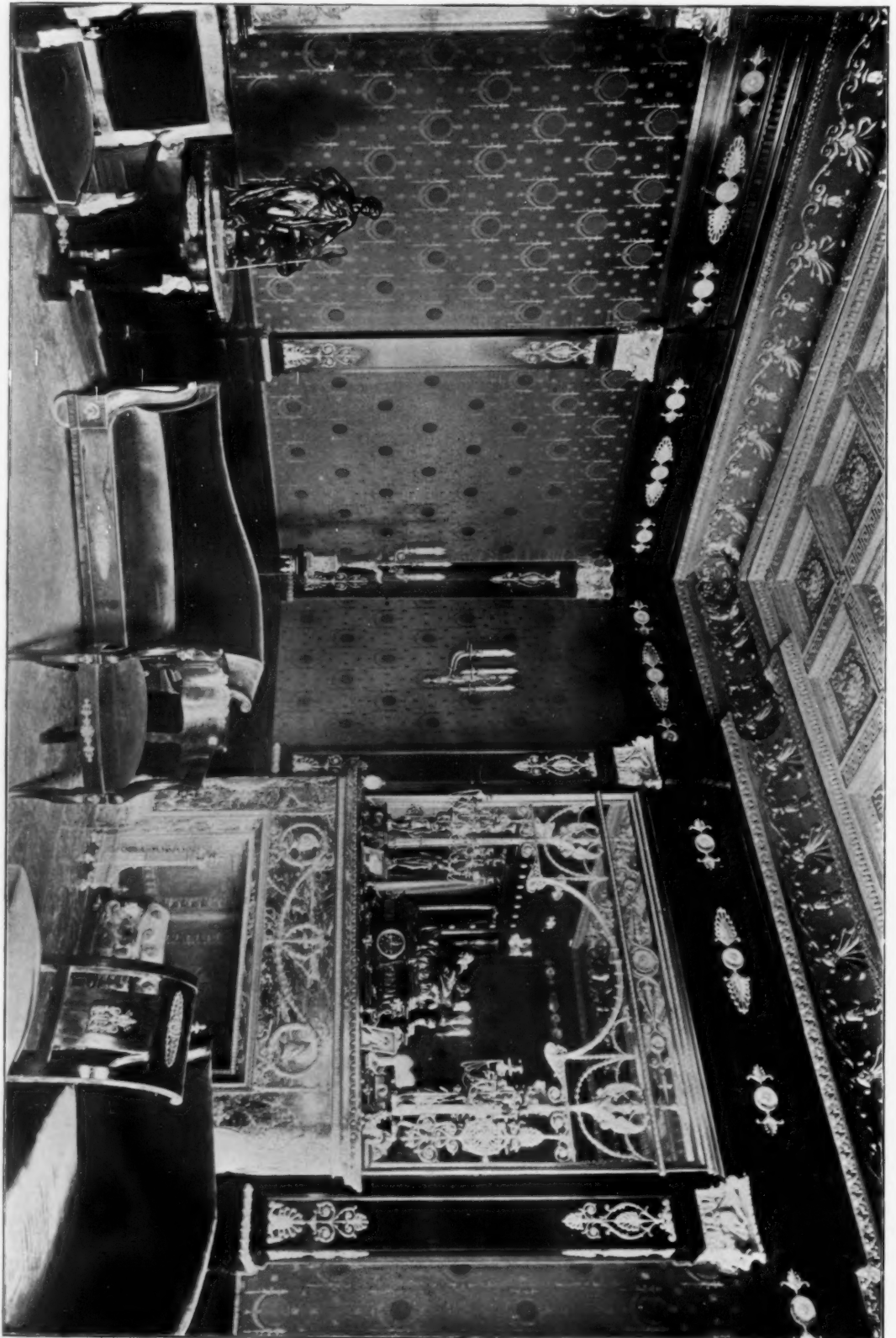


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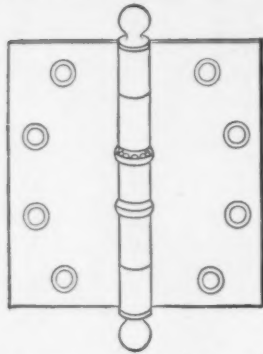
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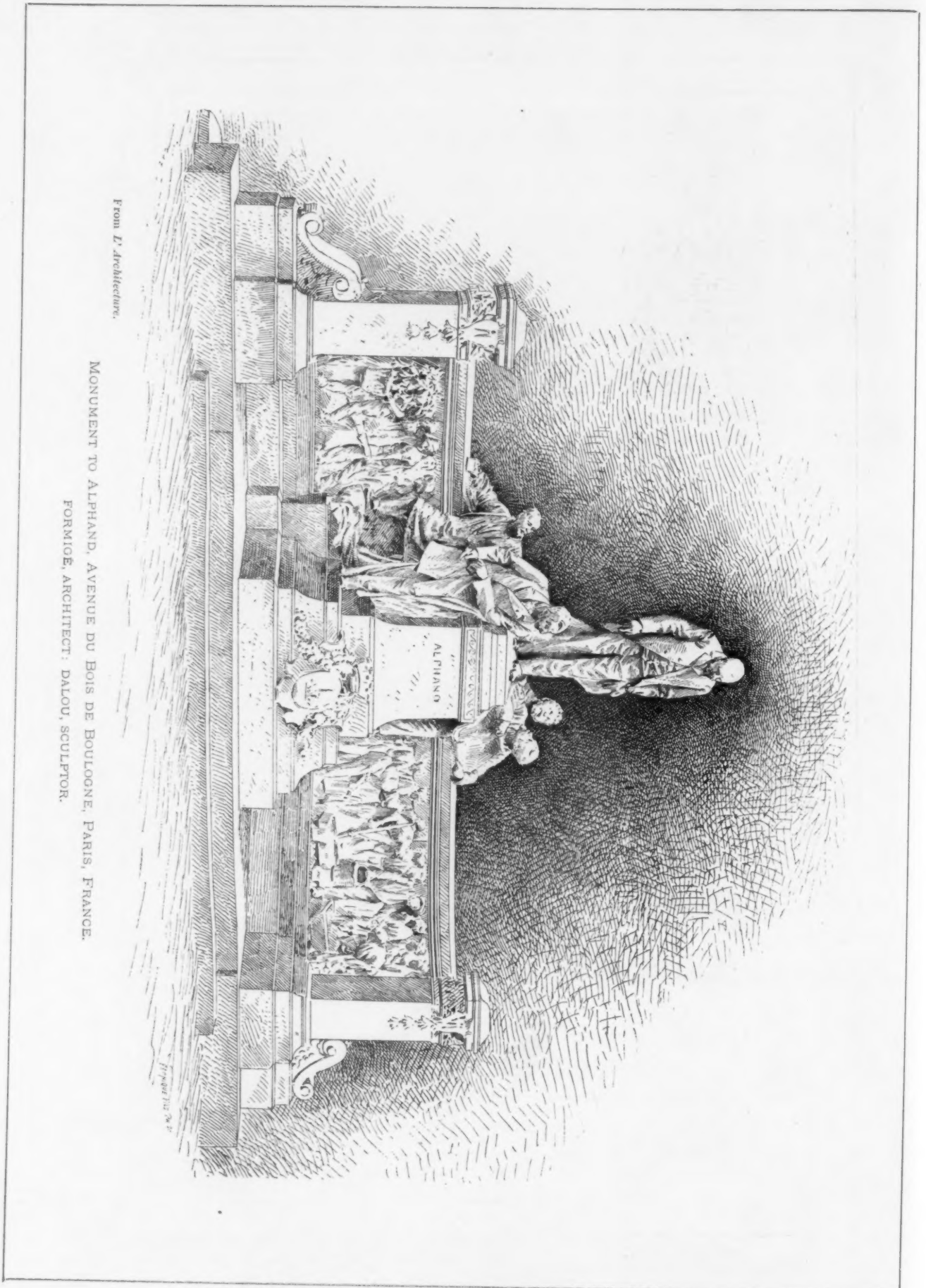
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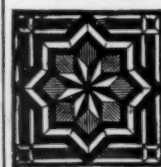
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**BUILDING INTELLIGENCE.**

(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.**

**Akron, O.**—The trustees of Buchtel College at a recent meeting rejected all the plans submitted by competing architects, and hired F. O. Weary, of this city, to prepare the plans and specifications for the new recitation hall to be erected this summer. The structure will probably be of brick with stone trimmings. It will occupy the site of the old recitation hall, which was destroyed by fire.

**Ashland, Wis.**—F. J. Pool is having plans prepared by Architect Chas. S. Sedgwick, Minneapolis, Minn., for a two-story and basement residence; cost, \$5,000.

**Austin, Tex.**—John W. Gates, the capitalist and railroad man of Chicago, Ill., will build a winter villa at Port Arthur. It is to be a model of architectural beauty and will cost over \$100,000.

**Baltimore, Md.**—The Madison Ave. M. E. Society, Madison and Lafayette Aves., will build a new mission church at Clifton. It will be constructed of brick and stone, and will cost \$25,000. Rev. Dr. E. B. Patterson, pastor.

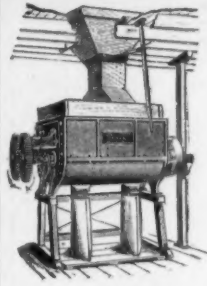
**Beloit, Wis.**—Architect F. H. Kemp has prepared plans for a frame residence for William D. Hall; cost, \$6,000.

**Bensonhurst, N. Y.**—A new Methodist Episcopal Society, to be known as St. John's M. E. Church, has been organized here with C. F. Roseman, president. A site is to be purchased in the vicinity of 84th St. and 20th Ave., whereon a church will be built soon.

**Benson, Minn.**—Architect Charles R. Aldrich, of Minneapolis, has prepared plans for the new Columbia Hotel to be erected here for John E. Lee. It will be three stories in height, 75' x 130', constructed of brick, and cost \$15,000.

**Brattleboro, Vt.**—Representative lumbermen and chair-stock manufacturers of the West River Valley contemplate building a large chair factory here with a view of saving a large part of the money paid in freight charges on chair-stock now shipped from Windham County to Gardner, Mass.

**Buffalo, N. Y.**—Representative Alexander introduced a bill recently in the House providing for the



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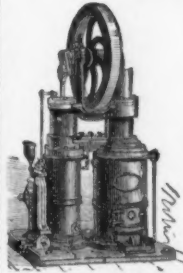
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**BUILDING INTELLIGENCE.**

(Advance Rumors Continued.)

purchase of a site and erection thereon of a public building in this city to be used as a marine hospital. The cost is fixed at \$125,000.

The McDonald Engineering Co., of Chicago, Ill., has prepared plans for a fireproof elevator and mill to be built at Elk and Prenatt Sts. for the Husted Elevator and Milling Co. The elevator will be 50' wide, 100' deep and 110' high, and will have a capacity of 200,000 bushels. The mill will be 20' x 100' in dimension, two stories high.

**California, Pa.**—Architect R. L. Barnhardt, Charleroi, has prepared plans for a three-story brick, stone and terra-cotta fireproof bank building for the People's Bank; cost, \$25,000.

**Calumet, Mich.**—H. L. Ottenheimer, Houghton, has designed a \$25,000 three-story store and office building, 50' x 100', to be erected for Miller Bros.

**Chattanooga, Tenn.**—A. S. Hamilton, president of the Trion Mfg. Co., Trion, Ga., is interested in the erection of a cotton factory here, to cost complete \$500,000.

**Chicago, Ill.**—The Anglo-American Provision Co. will erect a new box factory and car shop, adjacent to its packing plant at the stock yards, the plans for which are being prepared by Edgar S. Belden, 164 La Salle St.; cost, \$150,000.

S. M. Seaton has prepared plans for an apartment house to be erected at the corner of Vincennes Ave. and 46th Pl. It will be a three-story structure, 45' x 108', costing \$40,000.

**Columbus, O.**—C. B. Wolfe will erect a three-story brick shoe factory, 40' x 130', north side of Fulton St., between 3d and High Sts.; cost, \$6,500.

**Des Moines, Ia.**—D. S. Chamberlain will erect a \$30,000 residence on Denman Ave., after plans by Architects Liebke, Nourse & Rasmussen.

**Dubuque, Ia.**—Miss A. C. Ernst has had plans prepared by John Spencer, architect, for a two-story frame dwelling to cost \$5,000.

**Duluth, Minn.**—The Chevrei Kadisla Hebrew congregation will erect a synagogue on 3d Ave. E. and 3d St.; cost, about \$8,000. J. J. Wangenstein drew the plans.

Lynch & Fagan will erect a two-story brick building between 6th and 7th Aves. W. and Superior St.; cost, about \$10,000. J. J. Wangenstein, architect.

**Eldorado, Kan.**—At the election held on April 3 the proposition to build a \$25,000 school-building was carried.

**Elizabeth City, N. C.**—The M. E. Society will erect a new church edifice to cost about \$5,000.

**Fargo, N. D.**—M. E. Beebe, architect, has prepared plans for a two-story brick and stone building, 50' x 120', for G. H. Kirkpatrick, for a music store and hall. It will be of St. Louis pressed brick and Portage redstone; cost, \$13,000.

**Fernandina, Fla.**—Reports state that Andrew Carnegie will give a free public library to this city.

**Galesburg, Ill.**—Wm. Wolf, architect, has prepared plans for a sanitarium to be erected by E. V. D. Morris. It will be a two-story structure, 40' x 60', constructed of common brick; cost, \$10,000.

**Hackensack, N. J.**—Senator William M. Johnson has offered to give the town a library building to cost \$35,000. It will be a two-story brick and stone structure having a shelf capacity of 20,000 volumes.

**Hancock, Mich.**—Architects Charlton, Gilbert & Demar, Milwaukee, Wis., are preparing plans for a frame residence for J. R. Cooper; cost, \$7,500.

**Home City, O.**—B. C. De Camp, Cincinnati, has prepared plans for a brick school-building, 53' x 70', to cost about \$8,000.

**Indianapolis, Ind.**—Samuel H. Brubaker & Co., Stevenson Building, are preparing plans for a convention hall and permanent exhibition building to be 200' x 400', and five stories high, to be known as the Indiana Museum of Commerce and Manufactures.

**Jacksonville, Fla.**—Dr. William M. Bostwick will erect a large two-story business block at the corner of Main and Duval Sts., to cost \$15,000.

**Jenkintown, Pa.**—Plans have been prepared for a new church for the Baptist Society. It will be

**BUILDING INTELLIGENCE.**

(Advance Rumors Continued.)

built of stone and will be an imposing structure. Rev. B. G. Parker, pastor.

**Kenosha, Wis.**—Architects H. Messmer & Son, Milwaukee, are preparing plans for a factory for A. D. Meiselbach. It will be constructed of brick, with asbestos roof; cost, \$8,000.

**Lafayette, Ind.**—Plans are being prepared by Crapey & Lamm, Groton Building, Cincinnati, O., for a new church for St. Paul's M. E. Society. The new edifice will cost about \$20,000. Rev. A. C. Geyer, pastor.

**Lebanon, Pa.**—Harvey T. Hauer has prepared plans for a new brick and stone school-building; cost, \$25,000.

**Liberty, Mo.**—Architects Knell & Ittner, of St. Louis, have had accepted the plans which they drew in competition for the new Odd Fellows' Home. The design shows a building of the Early English Gothic type. It will cost from \$36,000 to \$52,000, according as the building is or is not made completely fireproof.

**Litchfield, Minn.**—W. T. Towner, architect, St. Paul, is preparing plans for an opera-house to be erected here. It will be 50' x 100'; cost, \$10,000. C. L. Angell, chairman committee.

**Lynn, Mass.**—Architect Henry W. Rogers, of Fabens' Block, Union St., has drawn plans for a new building to be erected at the corner of Mt. Vernon and Exchange Sts., for the Lynn Daily Item. The proposed structure will be five stories in height, 62 1/2' x 119', with the construction material of light gray brick and trimmings of limestone. It is to be of the French Renaissance type of architecture.

**Marinette, Wis.**—The Stephenson Baking Co. will erect a \$25,000 building, from plans by Ferry & Clas, architects, of Milwaukee.

**Menominee, Mich.**—The three-story block owned by C. A. Spies, which was burned with a loss of \$50,000, will be rebuilt immediately.

**Milwaukee, Wis.**—Architect A. C. Eschweiler is preparing plans for a flat building for Capt. Cochran, to be erected on Scott and Greenfield Aves. Will be brick, with furnace heat, open plumbing, gas light; cost, \$6,000.

**Minneapolis, Minn.**—Harry T. Downs, architect, has prepared plans for a residence to be erected on 26th St. and Fremont Ave. S., for A. H. Brochman. It will be 34' x 63', two stories, attic and basement frame, with hot water heat; cost, \$6,000.

**Moline, Ill.**—The First Congregational Society contemplates remodeling its church at a cost of \$25,000. H. W. Cooper, president.

**Nashville, Tenn.**—Architect J. E. R. Carpenter, of Norfolk, Va., is preparing plans for St. Vincent's Hospital to be erected on Church St.; cost, \$100,000.

**Omaha, Neb.**—Architect Charles Cleves, First National Bank Building, has prepared plans for a six-story pressed brick and stone warehouse, 66' x 132', to be erected on Leavenworth St., for the Avery Manufacturing Co. It will be of mill construction and cost \$50,000.

**Orono, Me.**—Plans have been prepared for a \$20,000 drill hall for the University of Maine. The new building will be 60' x 100'. President Lord, Hon. W. T. Haines and Dr. Harris are the building committee.

**Paducah, Ky.**—The Elks Lodge will form a stock company with a capital of \$20,000 to erect a lodge-room building.

**Philadelphia, Pa.**—Active efforts will soon be made toward bringing about conditions which will secure for Philadelphia the most magnificent art museum in the world. Designs for the proposed art-gallery were adopted on December 3, 1895, after a competition in which architects from all over the world participated, by a committee consisting of D. H. Burnham, William R. Ware, Joseph M. Wilson, Stanford White and John M. Johnson, but no active efforts to carry the plans into execution, until now, have ever been made. The cost of the proposed structure will be possibly \$6,000,000.

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## BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

\$2,000,000 for the purchase of sites, erection of building and equipment of eight high schools was recently introduced in the Board of Education.

Architect Edwin F. Durang has completed plans for the Normal School Building to be erected for the Sisters of Mt. St. Joseph's Academy at Chestnut Hill. The structure will be four stories and a basement, and will have a frontage of 200' and extend 260' in the rear. It will be constructed of Chestnut Hill granite.

**Pittsburgh, Pa.**—W. R. Beltz, 917 St. Clair St., has designed 2 pressed brick dwellings, to be erected on Rebecca St., for Contractor William O. Wright, 7098 Frankstown Ave.; cost, \$22,000.

Architects Peabody & Sterns, Boston, Mass., have prepared plans for a large residence to be erected on Forbes St., for Henry Graham Brown; cost, \$75,000.

**Red Oak, Ia.**—Architect W. T. Misner, Omaha, Neb., has prepared plans for a two-story and basement residence, 36' x 54', for H. C. Houghton; cost, \$12,000.

**Saginaw, Mich.**—Architect F. W. Hollister has prepared plans for a three-story brick and stone store building for Isaac Bearinger; cost, \$15,000.

**Scranton, Pa.**—Plans have been prepared by Percival Morris, Connell Building, for a \$60,000 church for the Catholic Society. Rev. Father Melley, pastor.

The Green Ridge Wheelmen will build a frame and brick \$12,000 club-house after plans by E. H. Davis.

**South Bethlehem, Pa.**—The physical and electrical laboratory of Lehigh University, which was burned April 6, with a loss about \$160,000, will be rebuilt at once.

**Steubenville, O.**—Architect L. R. Christie, Gill Building, has prepared plans for a pressed brick house for P. P. Lewis. It will have slate roof, bath-rooms, automatic water heater, furnaces, etc.; cost, \$8,000.

**Stoneham, Mass.**—At a town meeting held recently it was voted to build a brick high-school building, to cost about \$45,000.

**St. Paul, Minn.**—J. W. Stevens, architect, has prepared plans for a flat to be erected by E. M. Ware on Kent St. It will be 30' x 72', three stories, pressed brick cut stone, gravel roof and hot water

## BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

heat. Thos. Brady, 521 Selby Ave., has the contract for erecting the building. Excavating has been begun; cost, \$10,000.

J. W. Stevens, architect, is preparing plans for an addition and extensive improvements to be made to the building on 5th and Sibley Sts., by Wann. There will be a general renewing and an addition; cost, \$25,000.

Herman Kretz & Co., architects, have plans for the St. Thomas Seminary to be erected at Merriam Park. It will be 60' x 122', four stories and basement, of pressed brick and cut stone trimmings and white enameled brick for interior walls; cost, \$30,000.

**Wadena, Minn.**—Omeyer & Thori, architects, are preparing plans for a building to be erected for Whitney & Murray. It will be 50' x 90', two stories and basement, pressed brick with cut stone trimmings; cost, \$12,000.

**Wall Lake, Ia.**—Architect Harvey Greene has prepared plans for 4 brick and stone stores for Dr. Wheelwright. They will have gravel roof, plate-glass, iron and steel work, wire lathing, steam heat, etc.; cost, \$10,000.

**Waterloo, Ia.**—Shaw & Shaw, architects, have prepared plans for a four-story wholesale building for the Wangler Drug Co. It will be 48' x 140', of brick and stone; cost, \$20,000.

**Wilkinsburg, Pa.**—Architect L. A. Raisig has prepared plans for ten 8-room vitrified brick dwellings, to be erected on Trenton Ave., for T. R. Carboy; cost, \$30,000.

**ALTERATIONS AND ADDITIONS.**

**Philadelphia, Pa.**—Juniper and Chestnut Sts., new front & alterations to Hale Building; \$6,500; o., William Weightman; b., Benjamin Ketcham; a., Willis G. Hale.

Chestnut St., No. 1208, interior improvements; \$25,000; o., Herman Dilsinger; b., W. D. Lewis.

**Ypsilanti, Mich.**—Two two-story & base. wings to Normal School, each 35' x 60', slate roofs; \$15,000; o., Michigan State Normal School; a., Malcolmson & Higginbotham, Detroit.

**APARTMENT HOUSES.**

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## CHURCHES.

**Elizabethtown, Ky.**—Bk. church, 65' x 80', slate roof, hot air; \$10,000; o., Helen Memorial M. E. Society; a., J. B. Hutchings, Louisville.

**Germantown, Pa.**—Logan St., nr. Green St., one-story granite chapel, 97' x 167'; \$20,000; o., St. Francis Assist. parish; b., John McShain; a., Edwin F. Durang.

**Johnsburg, Ill.**—Bk. church, 50' x 72' x 150', slate roof, steam; \$38,000; o., St. John's Baptist Society; a., Anton Dohmen.

**Louisburg, N. C.**—One-story & base. bk. church, 46' x 58', slate roof; \$9,000; o., Baptist Society; a., Barrett & Thompson, Raleigh.

**Philadelphia, Pa.**—Broad St., nr. Spruce St., two-story granite church, 76' x 150' 4"; \$175,000; o., Chambers-Wylie Presbyterian Church; b., J. E. & A. L. Pennock; a., Rankin & Kellogg.

**Washington, Pa.**—W. Bean St., cor. Franklin St., one-story bk. church, 41' x 69', slate roof, steam; \$10,000; o., Cumberland Presbyterian Church; a., Sembower & Hagrett, Uniontown.

## EDUCATIONAL.

**Freelandville, Ind.**—Two-story bk. school, 65' x 83', slate roof, steam; \$8,000; o., School Board; a., Thomas Campbell.

**Niagara, N. D.**—One-story & base. st. school, 50' x 52', pitch roof, hot air; \$45,000; o., Grand Forks County, District No. 16; a., Russell & Crandall, Grand Forks.

## FACTORIES.

**Akron, O.**—High and South Sts., two-story bk. factory, 40' x 135', asphalt roof, steam; \$8,000; o., Akron Mfg. Co.; a., William Redding.

**Philadelphia, Pa.**—Woodlawn Ave., nr. 33d St., five-story bk. & fr. factory, 120' x 171½'; \$100,000; o., Croft & Allen Confectionery Co.; b., J. E. & A. L. Pennock; a., Charles Balderston.

Orchard St., nr. Tascony St., one-story bk. factory, 50' x 150', boiler & engine house, 34' x 36'; \$6,500; o., Elizabeth Coates; b., Joseph Cortnell.

## HOSPITALS.

**Chippewa Falls, Wis.**—Two-story bk. hospital building, 32' x 64', slate roof, steam; \$35,000; o., State of Wisconsin; a., John Charles, Menomonee.

## HOUSES.

**Boston, Mass.**—Harrishof St., nr. Harold St., eleven 2½-story fr. dwells., 28' x 53', pitch roofs, hot water; \$60,000; o., a. & b., A. C. Chisholm.

Park St., cor. Wellesley Pk., 2½-story fr. dwell., 15' x 32' x 61', pitch roof, furnace; \$5,000; o., Chas. A. Woodward; a. & b., S. B. Eter.

Blue Hill Ave., Nos. 140-142, 2 three-story bk. dwells., 21' x 55', flat roofs; \$12,000; o. & a., James W. Tobey.

Judson St., nr. Dean St., 2½-story fr. dwell., 29' x 42', pitch roof, furnace; \$6,000; o., A. E. Keeler; b., J. Crowe; a., J. A. Hasty.

Seaver St., nr. Walnut Ave., 2½-story fr. dwell., 40' x 56', pitch roof, furnace; o., W. J. Carlin; a., Fisher & Page.

**Germantown, Pa.**—Quincy St., No. 6805, three-story bk. & st. dwell., 31½' x 61'; \$8,000; o., George M. Megargee; b., G. D. Liddell; a., Lawrence V. Boyd.

**Houghton, Mich.**—Two-story fr. dwell., 42' x 45', slate roof, steam; \$5,000; o., Dr. Turner; a., Charlton, Gilbert & Demar.

**Milwaukee, Wis.**—Queen Ann Pl., two-story st. & fr. dwell., shingle roof, furnace; \$5,500; o., A. C. McDonald; a., Leenhouts & Guthrie.

**Wichita, Kan.**—Fourteenth St., cor. Lawrence Ave., two-story fr. dwell. shingle roof, hot water; \$7,000; o., C. W. Cooper; a., Elbert Lamont.

**MERCANTILE BUILDINGS.**

**Boston, Mass.**—W. Broadway, No. 419, four-story bk. mercantile building, 114' x 129', flat roof, steam; \$100,000; o., J. F. & W. H. Falvey; a., Charles Brigham.

**OFFICE BUILDINGS.**

**Nebo, Ill.**—Two-story bk. & st. bank building, 40' x 80', steam heat; \$10,000; o., Robert R. Pollock; a., C. E. Hain.

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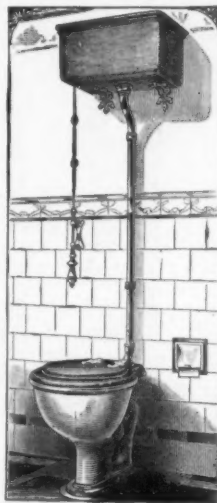
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Washington, D. C., April 14, 1900. Sealed proposals  
will be received at this office until 2 o'clock P. M. on  
the 12th day of May, 1900, and then opened, for the  
completion (except heating apparatus, plumbing, eleva-  
tors, electric wiring and conduits) of the U. S. Mint,  
Philadelphia, Pa., in accordance with the draw-  
ings and specification, copies of which may be had at  
the discretion of the Supervising Architect at this  
office or at the office of the Superintendent at Phila-  
delphia, Pa. JAMES KNOX TAYLOR, Supervising  
Architect. 1270

Treasury Department, Office Supervising Archi-  
tect, Washington, D. C., April 11, 1900. Sealed pro-  
posals will be received at this office until 2 o'clock  
P. M. on the 18th day of May, 1900, and then opened,  
for extension, etc., of steam heating and ventilating  
apparatus for the U. S. Custom-house and Post-office  
building at Dubuque, Iowa, 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 Super-  
intendent at Dubuque, Ia. JAMES KNOX TAYLOR,  
Supervising Architect. 1270

Treasury Department, Office Supervising Architect,  
Washington, D. C., April 11, 1900. Sealed proposals  
will be received at this office until 2 o'clock P. M. on  
the 17th day of May, 1900, and then opened, for the  
completion of the interior finish, plumbing, gas-  
piping, etc., for the U. S. Post-office, Court-house  
and Custom-house at St. Paul, Minn., in accordance

**PROPOSALS.**

with the drawings and specification, which will be  
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tect on application at this office or at the office of the  
Superintendent at St. Paul, Minn. JAMES KNOX  
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**SCHOOL-HOUSE.**

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**LIBRARY.**

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the erection of the Carnegie Library. T. H. MAR-  
TIN, chairman building committee. 1270

**COLLEGE BUILDING.**

Sealed proposals will be received until April 28,  
for the construction of new college building. F. P.  
HARRIS, President Board of Trustees, Ohio Valley  
College, Ravenswood. 1270

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the erection of a court-house. A. A. LINDAHL,  
county auditor. 1269

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**ASYLUM.**

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**HIGH SCHOOL.**

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mon, Kan. 1269

**COURT-HOUSE.**

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superstructure of a court-house. R. A. SALMONS,  
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**SCHOOL-HOUSE.**

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INGTON, sec. 1270

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1900, by the Board of County Commissioners for the  
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BRUCE, county auditor. 1270

Treasury Department, Office Supervising Architect,  
Washington, D. C., April 7, 1900. Sealed proposals  
will be received at this office until 2 o'clock P. M. on  
the 10th day of May, 1900, and then opened, for the  
erection and completion of the U. S. Government  
buildings, Pan American Exposition, on the Niagara  
Frontier, in accordance with the drawings and specifi-  
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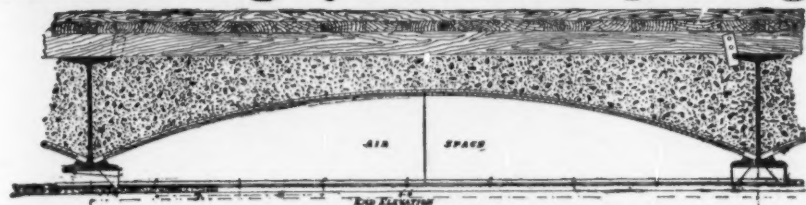
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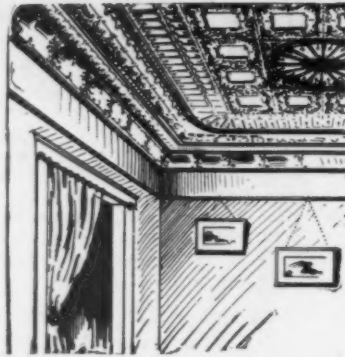
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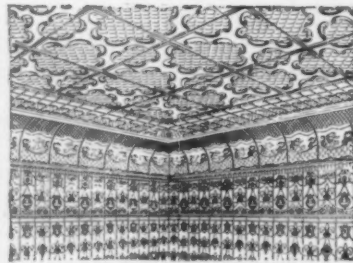
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