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THE announcement for the coming year of the courses in architecture at Harvard University contains a good deal of interesting matter. Very great importance is given to practice in freehand drawing and in architectural design. A student, to be admitted to the work in design, must show a satisfactory facility in drawing architectural forms, and in connection with his designing, he may continue his work in drawing, in pencil, pen and color, devoting himself at first to the study of architectural composition, purely as an artistic matter, using for the purpose the works of Turner, Cotman, Harding and Claude Lorraine, and afterwards to figure-drawing. We should be inclined to give the study of architectural composition among the painters a much wider range than that here indicated, but the idea is an admirable one. However "unpractical" it may seem to the ordinary mind to set the architects of the coming generation at studying their art among the pictures of Claude Lorraine and Turner, or Ghirlandajo and Paul Veronese, instead of in the clay-pits and planing-mills, it should never be forgotten that practical knowledge and artistic cultivation by no means exclude one another, and that, while both are necessary for an architect, it is so much easier for the student to get practical information, even of the higher kind, outside of a school than it is to get artistic training, that a professional school which has the proper facilities for the latter is justified in making liberal use of them.

IT is not to be supposed, however, that the practical side of architecture is neglected in Cambridge. The association of the architectural courses with those of the engineering school gives an excellent opportunity for the study of materials and structures, and of graphical and analytical statics, while care is taken to accustom students to look at problems in construction in an architectural way, as distinguished from the engineering way, by a special course in architectural construction, and by the instruction connected with the long course in architectural design. No doubt the parents of intending students will, like laymen generally, find it difficult to understand why an architect's way of thinking of construction should be different from that of an engineer, who uses the same materials, the same formulas, and the same methods of putting materials together, and it is only fair to explain, in defence of an apparent inconsistency which has brought public criticism upon many a school of architecture, and which, we are glad to see, the Harvard staff frankly accepts, that, while engineers are called upon to accomplish certain results, such as bridging streams, or roofing large spaces, or accommodating great systems of machinery, with the least expenditure of material that will suffice to accomplish the desired result, architects are expected to provide in their buildings, in addition to safe and comfortable shelter, graceful lines and proportions, and agreeable contrasts of light and shade. In most cases the latter cannot be secured without some sacrifice of the economy which is the chief object of the engineer, and the architect, knowing what his clients want, is, and ought to be, trained in the habit of looking at materials and methods of construction as a means of expressing artistic thought, as well as of enclosing given spaces. Of course, the engineer can give his bridge-arches, or his roof-trusses, graceful lines, just as the architect is often very successful in combining good effect with a minimum of expense; but the habit of mind of the two professions is different, and it would be as unreasonable to expect a tailor, who had been trained to the business of dressing paupers with the smallest quantity of cloth that could be stretched over their limbs, to produce becoming clothes for people able to pay for them, as it would be to imagine that a man who had all his life looked at building-materials as substances to be economized and dispensed with could enter fully into the artistic feeling which, in architecture as in all other arts, avoids everything like exiguity and straining, finding that beautiful effect is more dependent upon a certain comfortable massiveness than on all other conditions combined.

THE list of names of the architects chosen to compete for the New York Custom-house is of much interest, as showing the idea entertained at Washington of the professional rank of Eastern architects, or, at least, of the architects of New York and two other cities, which have, as yet, had no large Federal building erected under the new system. Of the New York architects, those invited are Messrs. McKim, Mead & White, George B. Post, Bruce Price, Carrère & Hastings, Francis H. Kimball, James B. Baker, Cady, Berg & See, Clinton & Russell, Robert W. Gibson, Israel & Harder, Babb, Cook & Willard, Henry J. Hardenbergh, Cass Gilbert, Trowbridge & Livingston, George Martin Huss, and Howard, Cauldwell & Morgan; from Boston, Messrs. Peabody & Stearns and Shepley, Rutan & Coolidge are invited; and Messrs. D. H. Burnham & Co., and Henry Ives Cobb, from Chicago. It is evident that this selection is the work of one very well acquainted with professional matters, and it was probably left mainly to Mr. James Knox Taylor, the Supervising Architect of the Treasury. However this may be, the contrast between such a list and that which would have been made up in Washington not many years ago is instructive. All experienced members of the profession remember the nondescript creatures who, in the good old times, used to make their appearance as architects whenever a public building was in question. As a rule, no one in the profession had ever heard of them before, and after their public employment terminated they were not heard of again until a new State-house, or court-house, or asylum, or jail had to be built at the taxpayers' expense; but, for some mysterious reason, they were always awarded the public work, and it was well understood that respectable architects would only waste time and money in complying with invitations to "compete" against men who adorned their elevations with Corinthian pilasters without any bases, and carried them into execution with massive details of galvanized-iron, painted and sanded to look like stone, and, even with the help of iron columns, inserted at irregular intervals in rooms where nothing of the kind was shown on the plans, rarely contrived to arrange a building so that it did not need extensive alterations within a few years, to render it tolerably fit for its intended purpose, if not to keep it from falling down. Now, however, as it appears, an officer of the Government is allowed, without protest, to think of artistic harmony in the erection of public buildings, instead of political harmony, and to make up his list of competitors in such a way as to endeavor to secure the former, rather than the latter. How great a progress this is, only the people who are familiar with public building-work know; and, while we should not, perhaps, have made exactly the same list as that published, it is certain that the competition will bring out the best that the profession can do, not in pulling political wires, or in bribing janitors to exert their powerful influence on the judges, but in designing a beautiful, strong and convenient building.

THE new monument to Lafayette, which is to be presented to the French Government by the school children of the United States, is to be executed by Mr. Paul W. Bartlett and Mr. George G. Barnard, Mr. Bartlett carrying out the bronze equestrian statue of Lafayette, and Mr. Barnard undertaking the two groups in granite which adorn the pedestal. The architectural part has been entrusted to Mr. Henry F.

Hornbostel, of New York. The French Government has set apart for the monument perhaps the most honorable place in all Paris, the court of the Louvre, in front of the Pavillon de Sully, close to the passage leading to the garden of the Tuileries. The presentation is to be made on the first day of July, 1900, but, as it will be impossible to complete the bronze statue by that time, a model of it only will be unveiled. Messrs. Bartlett, Barnard and Hornbostel were all students in Paris at the same time, and were regarded by the Art Committee of the Lafayette Memorial Commission as peculiarly qualified for their work.

THE H. W. Johns Manufacturing Company sends us, as a sort of reply to some observations of ours on the fallacy of expecting to make wood fireproof by covering it with plaster, some documents relating to a new product, known as "asbestic," consisting, as is explained, of pulverized soapstone or serpentine rock, containing, as serpentine often does, a large proportion of asbestos, mixed with lime. Probably most architects have wondered why some one did not adopt the idea of using asbestos fibres for mixing with plastering mortar, instead of the weak and perishable hair or wood fibre, and will be interested to find that it has at last been put in practical form. There is, apparently, more asbestos than serpentine in the mixture, for it is said to be much lighter than ordinary mortar. In regard to its fireproof qualities, as the serpentine, which is mainly silicate of magnesia, is an excellent non-conductor, and the asbestos fibre, which may be presumed to hold some air entangled, would be equally so, it is reasonable to suppose that the new material would heat through more slowly, and stay in place much better than ordinary mortar, so that it may be hoped that a material of great value has really been produced.

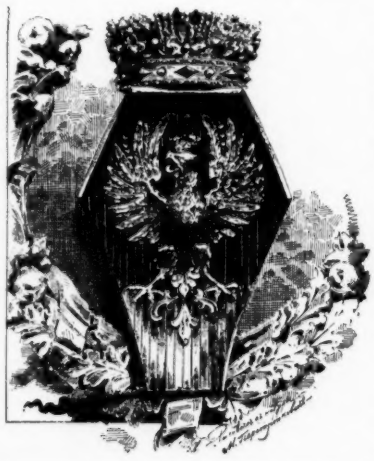
IT is unfortunate that the daily papers entrust, apparently, the writing of their disquisitions on archæological and scientific matters to their office-boys, or other persons so ignorant, both of science and the English language, as often to make the serious work about which they write unjustly ridiculous. Just now, Professor Holmes, of the National Museum, at Washington, is suffering from the attempts of these glib blunderers to describe what would probably appear to be valuable discoveries, if a correct idea of them could be extracted from the absurd rubbish which is written about them. It seems that Professor Holmes was sent, not long ago, to examine "an extensive crumbled city, — probably another Aztec centre," which, we are told, has not been "hitherto studied by men of his science." This "extensive crumbled city" turns out to have been Xochicalco, which is, to say the least, not unknown to men of science, whatever Professor Holmes may have found there. We say, may have found there, for it is a task beyond our capacity to comprehend what he actually found there from the description of it to which we are treated. "The technologist," we are told, meaning, probably, Professor Holmes, who could have been quite adequately described without making any ridiculous and ungrammatical addition to the English language for the purpose, "located" on "this ancient Gibraltar," Xochicalco being a mound two or three hundred feet high, in the middle of a plain, "rows of ruined houses with surrounding courts or plazas." If any one can imagine a house with its court outside of it, instead of inside, or a "row of houses" with a "plaza" around each, he can, perhaps, form an idea of the appearance of this settlement. The explorer "discovered" that the houses and other constructions that covered a large part of the hill were due to "some prehistoric race," and it was "suggested" to him, by the appearance of "numerous subterranean caverns" dug in the hill, and "doubtless leading to secret vaults beneath the temples," that "priestcraft exerted a strong influence upon the lost populace of the Hill of Flowers,"— that is, the "ancient Gibraltar." The inference, from finding a "subterranean cavern" in a hill, that "priestcraft" exerted a strong influence upon the "lost" people of the hill may have suited the mind of a "technologist," but it is rather too much of a jump for the plodding temper of the ordinary scientific man, and it is a pity that the explorer did not take time, while he was on the spot, to make inquiries of some "remnants of their dispersed race" who, as it seems, instead of being "lost," or "prehistoric," are still living comfortably in "a nearby village," and ought to know at least as much about their ancestors as could be inferred from looking at a "subterranean cavern." Moreover, we are told that these "remnants" present an appearance like "that of the present Aztec population of Mexico." We had not supposed that Mexico possessed anything that could be called an "Aztec population," and the information that Professor Holmes believes the Xochicalco buildings to have been carried out by the same people as those who constructed "the great Aztec temples of Yucatan," which have hitherto been regarded as the work of the Maya race, which still inhabits the surrounding country, does not do much to clear up the ethnological portion of the account; but we may at least observe that a race which still exists on the spot, even in the form of "remnants," and which resembles a portion of the present population of the country, can hardly be regarded as "lost," or "dispersed," or "prehistoric," in any sense known to the dictionary, whatever may be the meaning that "technologists" attach to those terms.

ONE discovery, however, which is casually mentioned in the middle of this mass of rubbish, seems to be of real interest. We are told that "the party approached the Hill of Flowers by a road leading across a bridge of three arches, firmly built of stone and mortar, and displaying engineering skill which would do credit to a white man. This bridge was found standing by the Spanish pioneers in the country. It was in all probability built by the same people who lived in the city above." It is hardly necessary to say that a three-arched bridge of stone and mortar, built in Mexico before the Spanish invasion, would be a most interesting object, architecturally as well as archæologically, whether built by Aztecs, or Mayas, or "lost" races, and we trust that we may have before long a sensible description of it, from Professor Holmes himself, who will understand the great importance of every detail, such as the form of the arches, the presence of an impost or otherwise, the jointing and shape of the voussoirs, and the distribution of the spandrel filling.

IT is not so very long since the tourist who could boast of having been in the "Dolomite Region," on the border-land between Italy and the Southern Tyrol, was looked upon as an adventurous person; and, even now, travellers going north from Verona, toward the Brenner Pass, say to each other, as a rugged group of distant snow-covered peaks comes in sight across the valley of the Adige, "Dolomite Mountains," with an air of mystery. Now, however, the electrical engineer has established himself in the heart of the Dolomite country, at Meran, the wild Adige is bridled with a dam, and is industriously turning out kilowatts of electricity, part of which is used for lighting the towns of Meran and Bozen, while the remainder is turned into a battery of ovens, for the manufacture of calcium carbide. The limestone for making the carbide is taken from a quarry on the side of the mountain close by, beyond which rises the Ortler Spitz, the highest of the Tyrolese summits. The Acetylengasaktiengesellschaft, which has, apparently, not consulted the tourists, is said to be pleased with the work that the glaciers and the river are doing for it, and is contemplating an immediate doubling of the Meran plant, and the erection of another in Hungary, for utilizing the beautiful cascade of Pétroszéni, which now wastes its six thousand horse-power in doing nothing.

IT is interesting to read that the most powerful steamship in the world is in process of construction, to ply on a fresh-water lake, in the interior of Asia. This fresh-water pond is Lake Baïkal, in Siberia, and the steamboat is intended to transport across it the trains of the Trans-Siberian Railway. As the lake is frozen to a great depth in winter, it is necessary, to prevent suspension of the traffic in the coldest weather, to provide the steamer with means of breaking the ice in its course, and it is, for this purpose, equipped with engines of forty thousand horse-power. A similar boat, but of much smaller size, is employed in the port of Cronstadt. This has engines of twelve thousand horse-power, and will make its way, at a speed of about two miles an hour, through ice five feet thick, so that the Baïkal steamer, with engines of more than three times the power, seems to be calculated for anything short of Arctic weather. The force possessed by this mighty craft may be judged by comparing it with the largest of the North German Lloyd steamers, the "*Kaiser Wilhelm der Grosse*," which is claimed to be the most powerful vessel on the ocean, but has engines of only twenty-seven thousand horse-power, while the great majority of ocean freight steamers are driven by less than one thousand.

THE USE AND VALUE OF COLOR IN ARCHITECTURE.



Escutcheon from the Monument to Alexander III, Moscow, Russia.

IN studying the use and value of color, it will, perhaps, be pertinent first to distinguish between paint and light.

We see objects by means of the light which is reflected from them to our eyes, and we distinguish between objects by means of the arrangement and the kind of light-rays. It is the latter phase, the kind of light, that is here considered, these variations in kind being called "colors."

When an object looks of a "green color" it is because that object reflects green light to the eyes. If white light strikes the green object all the light except green is absorbed.

Colors are divided into warm and cool shades. Light colors make an object seem much larger than it would appear if full tones were used. A familiar example of this may be seen when one compares one's feet when dressed first in white and then in black shoes. Colors spread or diffuse, so that when two are adjoining they affect one another in appearance.

Colors are divided into classes, which variations are called "shades," and there are modifications, also, of these shades. If a shade has an extra amount of white in it, making it a lighter shade, it is called a "tint," and if there is less white in a shade it is called a "tone." As there are, therefore, any number of variations of shades, tints and tones, there are innumerable color-combinations. For general work of decoration a full shade is seldom used, it being nearly always preferable for color-schemes to be composed of tints or tones. Because of surface-reflection, a very strong light throws back some of the white with the real color of the surface and in this way a full shade is made a tint, that is, the color seems lighter in appearance. For this reason the Egyptians and Greeks, in their bright sunshine, used the full red, blue and green shades.

In speaking of combinations, emphasis must be placed on the fact that pure mixings of light rays as compared with mixings of paint are quite different.

The Uses of Color. — We are frequently hearing the question, "What is the use of color?" And the answer almost quite as frequently echoes, "No use." This, however, is not exactly true, for even if color gave satisfaction and pleasure to the eyes only, it would be sufficient to prove its usefulness, in the present day quite as much as in the earlier ages of history.

Color assists in distinguishing forms in an artistic manner, which cannot be equalled by line-drawings, however carefully the latter may be executed. For example, take an engraving or etching of a landscape: the lines necessary for portraying the different planes in the picture are varied in their degree of depth to assist in producing distance. The distant effects so gained, however, are not always produced by the mere lines only, but are due to the relative grades or intensity of the color used in the lines, be it black, brown, or any other monochrome, or to their being drawn in closer or wider proximity to one another, so that alternating with the white or other local color of the ground-spaces of the picture they produce at distances the desired degrees of tone, the result being derived as much from the gradation and spacing of the lines as from the actual lines themselves. Such pictures, if executed in colored lines viewed from a distance, often give to an inexperienced eye the same effect as a monochrome picture.

Examples of the manner of denoting colors by lines (instead of brush-work), *i. e.*, scoring or crossing of lines, are to be found in heraldic designs; escutcheons are frequently scored, some with single parallel lines and others checkered with squares or crossed diagonally, either of which methods gives an appearance of color to the whole surface.

The colors in flowers serve, perhaps, no real purpose beyond pleasing the eye of persons generally, but the gardener finds the colors most useful when laying out his grounds and other floral effects he may wish to produce, by the introduction of the various colors found in his plants. If all flowers were of the same hue we should soon weary of the monotony; the various forms of foliage, while being beautiful in themselves, would lack in usefulness, which fact would prove again the use of color in flowers as decorative objects. The use of color, therefore, in natural plants being apparent, much more so is it when plants and flowers are made the "*motif*" for decorative designs in wall-paper hangings, whether in a conventional or realistic form, also in decorative china and porcelain, tapestries and many other art-objects into which flowers can be introduced as decorative features. It would be hard to imagine the earth deprived of its varied tints of verdure and the trees all of one shade of color.

Color, therefore, pervading the world in its variety of shades and forms, is a natural creation, and it is generally admitted that all natural creations are more or less useful. The history of the world (not only the written history, but what may be termed the material history, or, in other words, the ornaments of the early ages which from time to time are being discovered) goes to show that as soon as the absolute necessities of life and shelter had been supplied the next efforts were to beautify them by use of colors.

In the ruder conditions of man the desire for the primary or positive colors was most marked, and in relative proportion to the civilization of man the use of colors became more refined and brought into harmony with the cultivated tastes of the various tribes and nationalties. From the earliest up to the present day colors have been most useful in the army and navy as distinguishing marks of the different nations. Also in ecclesiastical and collegiate orders their use is asserted to a large extent. Imagine a college without its "colors" or the church ritual without its embellishments.

Coming down to the domestic sphere, every habitation, from the smallest hut to the most palatial residence, has in some form or another an application of color. Coloring gives repose to the eye when shadings and shadows are, as in nature, used in true contrast to the lights, and produces the rule for harmony. Examples of neglect of such harmony may frequently be seen in our modern domestic dwellings. For example, it will be found that rooms with north lights are often decorated with ornaments shaded in grays or cold colors, whereas warm shadings should be used, and, *vice versa*, rooms with sunny aspects as a rule should be treated with cool shadings. The choice depends, however, considerably upon the source of the light in the room, whether from direct or reflected rays. The artist will at once see and adapt his color-decoration to the peculiarity of the situation. The above remarks, however, are worthy of remembrance by those unfamiliar with the art of painting and decorating.

The elements, then, or natural forces by which colors are produced, are the positive and negative principles of light and darkness, these elements being represented by white and black from the elementary colors. Between these two colors exists an indefinite gradation of shades, which are termed "tints" and "tones." All the elementary and compound hues and colors may be generated by the scale termed "chromatics." For example, a spot of any shade or color on a ground lighter or darker than itself, being viewed through a prismatic lens will be reflected by the refraction of light and shade into an orb of three colors, these three colors being termed "blue," "red" and "yellow," which are incapable of being produced by composition, or of being resolved into other colors by analysis, and are simple, primary colors elicited by the electrical excitement or concurrence of the light and shade of the ground and spot of color. Accordingly, if the ground and spot of color be changed from light to dark, or from white to black, the same process with the prismatic lens will produce the same relative colors, differing only in the inversion of their arrangement, being the order of the colors in the rainbow.

This evolution of colors or polar principles of light and darkness is a simple act of nature, which gives us the first order of colors in the sequence of their relation to white and black, and it is the constant law of chromatics by which all the relations of color are determined.

The Order of Colors. — Colors are of three classes, primary, secondary and tertiary. Any two of the primaries mixed in proper proportions will produce a perfect secondary which will harmonize with the remaining primary, *e. g.*, yellow and blue mixed together form green and will harmonize with red. Red and yellow will produce orange and will harmonize with blue. Blue and red will form purple and will harmonize with yellow. Likewise the alternating of these secondary colors and mixing them in pairs will produce the third class of colors. Thus if orange color be mixed with green they will produce a citron color; if purple be mixed with orange they will form russet, and if green and purple be mixed they will give olive color.

Admixtures of these colors produce the varieties of shades and tints by which nature is decorated and which predominate in all works of an artistic nature. By an indefinite or disproportionate mixture of the three colors of either class or of the whole together, we derive the hues usually termed "brown." The browns are also a very valuable and useful class of color for producing warm tones in a picture, as also are the grays for affording cool effects, being the contrary of brown.

The primary colors may, however, be materially changed by admixtures; by mixing them in varied proportions many different hues or tints are produced. It is seldom, however, if at all, that the pigments used by the artist or decorator are the perfect representations of the primaries. For instance, there is practically no yellow pigment in use which can be said to be free from a small trace of red or blue, no red that is really free from a slight admixture of yellow or blue, and no blue without a small proportion of red; and in consequence it follows that no secondary color can therefore be perfect, but will approach perfection just in the same ratio as the adulteration exists in the primaries — the adulterations arising from chemical impurities and differences of transparency or opacity.

The Secondary Colors. — Orange is the first of the secondary colors in relation to light. It is an advancing color in painting and decoration, and in nature it is effective at a great distance, acting powerfully on the eye. A true or perfect orange is such a compound of red and yellow as will neutralize a perfect blue in equal quantity

either of surface or intensity. It forms a series of warm semi-neutral colors with black and harmonizes in contact with a variety of tints and with white. It is a warm color and also discordant when standing alone with yellow or with red unresolved by their proper contrasts, or with any pigment having an inflammable basis, for with all such it occasions changes in color by becoming dark or by fading the colors with which it is mixed.

The practical uses of the primary, secondary and tertiary colors are as follows: —

1. *Yellow* is the first primary; it has the power of reflecting light and is a most advancing color. As a pigment it is a tender, delicate color and easily spoiled by other colors. In painting it diminishes the power of the eye by its action in a strong light, but in a declining or weak light it aids vision and becomes more distinct as a color. Of all colors except white it contrasts black most powerfully.

2. *Red* is the second primary color; it is preëminent among colors and is the most positive of all. It affords warmth to all colors but mostly to those which partake of yellow, and is the second power in harmonizing and contrasting other colors and in compounding black and all neutrals. Mixed with yellow it becomes warm and advancing, but if combined with blue it is cool and retiring. These qualities of red give it great importance in decoration, and render it difficult of management. In nature, red is used very sparingly, and in practice likewise it should be used with discretion. Red diffuses with white, but it is discordant when used with orange alone. It is powerful and cheering and cannot be composed by mixtures of other colors. In China, red color is consecrated to religion, owing perhaps to its being one of the most beautiful colors in nature.

3. *Blue* is the third primary. It bears the same relation to shade that yellow does to light, hence it is a most diffusing and retiring color, and is the only color that alone possesses what is termed "colorness" in coloring. It is powerful in a strong light but is weakened very perceptibly by a declining light, and becomes neutral and pale, owing to its affinity to black or shade and its power of absorbing light. Blue is discordant when placed in conjunction with green and in a less degree with purple, both of which are cool colors. It should always be used in a proper proportion with its contrasting color, orange, which would have a tendency to correct its coldness. In botany we see fewer flowers of a blue color than any other of the primaries and their compounds. Blue flowers can be changed by cultivation into red and white, but never into yellow, as also, to the contrary, yellow flowers are readily converted into red and white but never into blue, and likewise red flowers are changeable into orange and purple but never into blue or yellow. Blue is universally agreeable to the eye when used in due relation and proportion to the composition and may be more frequently repeated in a color-scheme or picture than almost any of the other primaries, and it cannot be composed by mixtures of any other colors.

The use of color and the art of applying it to decorate or embellish documents appears to have had its origin in the East. The Egyptians were in the habit of rubricating their manuscripts, as also were the Greeks and Romans, although little evidence exists in either country previous to the Christian era.

Towards the end of the fourth century this mode of decoration was more frequent. Examples dating from the fifth century are to be seen in the British Museum, the colors predominating being bright purple or rose color. In the eighth and ninth centuries the art of staining vellum appeared to decline and the colors used were less pronounced. Manuscripts written in letters of gold on white vellum are chiefly works of the eighth, ninth and tenth centuries. Writing in gold was less employed in the eleventh, twelfth and thirteenth centuries than in earlier times, but it again came into use in the fourteenth century, particularly in devotional books and with persons of rank.

From the eighth to the eleventh century occur in the Greek and Latin manuscripts initial letters of large size at the beginning of books and chapters, principally composed of human figures, animals, birds, fish, flowers, etc., all in color, the chief features of the ornaments and letter being the extreme intricacy of pattern: interlacings of knots in a diagonal or square form, sometimes interwoven with animals and terminations in heads of serpents or birds, to which was added the use of red dotted lines round the edges of the larger letters. The lizard, from the facility with which its graceful form could be made to harmonize with every variety of curve, seems (under various conventional modes of treatment) to have been the favorite reptile introduced in all kinds of ornamental design during the whole period of the Middle Ages, but at no time so profusely as during the twelfth century, when the coloring of these initial letters was of a simple character. The outlines were usually red, the foliage and figures without color, but relieved by having the intervening spaces picked-out with various tints. In the more elaborate examples the letter in its ordinary form was represented in burnished gold and the foliage and other accessories by which it was surrounded and interlaced formed a mass of the most varied and gorgeous colors brought into harmony with one another by the admirable taste shown in their arrangement, the letters and all the details being outlined in a strong color.

In the thirteenth century a new character was given to illuminating. The larger letters, composed chiefly of scroll-work, became more intricate and lost, in minuteness of style and over-elaboration, the boldness of character and simplicity of treatment of the preceding age. In the smaller initials figures were more abundantly employed, and groups representing the leading facts in the volumes themselves were frequently given within the circumference of the letters.

During the fourteenth century the same character continued to pervade illuminated letters and pictures, but in the fifteenth century immense strides were made; the conventional treatment began sensibly to decline and an almost endless variety of examples, both in design and coloring, are to be seen in the manuscript records of that period. The ornaments and letters were in a totally different taste from those of the earlier dates. Nature was again studied, and in lieu of grotesque figures flowers of every hue were introduced, fruits, birds and insects most delicately and minutely colored upon gold grounds, with a perfection of execution and taste. It was, however, in the sixteenth century that the highest degree of excellence was accomplished. The examples of this period seem to combine all the refinement of Italian art in composition and coloring with a delicacy of execution to be found only in the Persian and other Eastern manuscripts.

The French, German and Flemish illuminations, though different in character, were but little behind those of their Italian rivals in point of merit; but in England the art declined from the latter part of the fifteenth century, owing to the general employment of foreigners.

For a century after the invention of printing the art of illuminating made steady progress, but from that time it began to gradually decline, and although it existed as late as the seventeenth century, it was rarely practised and was almost entirely confined to religious books.

The use of colors and methods of the application of them to the various forms of architecture was well understood by the Egyptians and by the Greeks. The Romans, on the other hand, diminished the use of color, and adapted marble and stone to the surfaces of the buildings, although they applied highly-effective decorative paintings to flat surfaces of plastered walls, etc. Turning to Christian art, we find an intimate union between color-decoration and architecture, and can trace it all through the important works of the Middle Ages. The object of using color-painting was to obtain richness and uniformity of effect in such parts of the Byzantine churches as were not constructed of marbles or mosaics.

The colors principally used by the Egyptians were red, blue, yellow, with black and white to give distinctiveness to the various tints, and green used generally as a local color, the formation of their designs being of a geometrical character and symmetrical of arrangement, the lotus and papyrus from the banks of the river supplying the idea for all their color-decoration.

The Greeks borrowed their color-ideas partly from the Egyptians and Assyrians, and rose rapidly to a state of perfection in color-decoration. The honeysuckle was a favorite ornament, and is found in a variety of very pleasing forms on old Greek vases; each leaf seems to have been executed with a single stroke of the brush.

In the Byzantine period colored ornaments are distinguished by broad-toothed and acute-pointed leaves, and almost always finished in gold. Very profuse geometrical designs are found in this style.

The Romanesque style of architecture was peculiarly adapted to color-decoration; the mouldings, pillars and capitals were painted with appropriate patterns. During the Middle Ages the interiors of the poorest as well as the richest buildings were treated in color.

Very little is known of color-decoration in England, so far as modes of application, prior to the Saxon period, but there is little doubt that some skilled work was executed at that time, some interesting examples of the Saxon and Norman periods remaining to be seen in various cathedrals. Peterborough affords some very fine examples of the latter period. There is a similarity between the decorative color-work of the twelfth century and the illuminated manuscripts of the same period, to which I referred in the earlier part of this essay.

In France, prior to the time of Charlemagne, decorative painting as applied to architecture was very simple in treatment.

All color-decoration, to be effective, must be flat; in other words, must not be worked in shades to produce relief or shade lined. It is permissible to use gradations of color, but even then only in a conventional form, without any definite lines of light and without any shadows. Flat painting requires a peculiar treatment, both in regard to coloring and drawing, especially if it be intended to follow the various periods of the Middle Ages. Then forms and figures must be rendered with sharply-defined outlines. When two light colors are used together they should always be separated by black or dark lines, and when dark or rich colors are used light separating lines are necessary. The colors must be selected in reference to the position they will occupy, and their depth of tone graduated accordingly; also, as to the distance from the eye and amount of light received, great care must be exercised in choice of tints. In the best examples the ornamentation is kept as much as possible subordinate to the architectural forms of the buildings.

A few words upon the use and application of color when executed by stencilling may, perhaps, be acceptable. For ordinary work of large details, tough brown paper, highly rolled and well painted and shellaced or varnished on both sides, is used for the stencil-plate, the design being cut accurately with a sharp instrument. In case of very delicate designs, tint-plates may be used with advantage. The colors are then applied to the walls over the stencil-plate in the necessary colors called for in the design; the brush should be used as much as

possible in the direction of the design in applying colors by free-hand work: in flowers, from their centres towards their edges; in leaves, from stems to their points, or from their main rib to edges. In scrolls the brush should follow the curves. Broken color is valuable in hand-painted work, as well as in stencilling. It will always be found advantageous in color-decoration to avoid the use of bright, crude coloring. Chrome-yellow, vermilion and ultramarine, orange-chrome and emerald-green should be used very sparingly. The safer yellows are the various ochres, especially Oxford ochre, which produces a beautiful quiet tint in combination with white and other pigments. In the class of reds, Indian and Venetian reds with ochre produce quiet colors of great value. Ochre, also, with Prussian and other shades of blue supply us with some excellent greens. All greens used for decorative work should be, as a rule, composed of blues and yellows and not be the ordinary green colors of commerce.

To fully describe the value of color would occupy too many pages. It will, however, suffice to mention a few of the numerous ways in which it may be realized. In almost everything that we see around us in nature or architecture, painting, sculpture, and, in fact, in all the arts, we find color predominating in a greater or less degree and without which many of the greatest masterpieces would fall into insignificance. Looking to Nature we find it in multitudinous forms. In architecture it is ever present. In the early ages color was introduced into terra-cotta in a variety of shades, the value of the tints being readily recognized and appreciated by the Egyptians, as illustrated by the examples of pottery which have been discovered from time to time. Bricks and terra-cotta are perhaps the two most useful materials for supplying color as a permanent decoration for buildings at a reasonable cost. Of course marbles and granites and the great variety of stones all more or less derive their value from their natural coloring, but, being more expensive, are not used in so many ways as terra-cotta. Each stone-quarry furnishes us with a color peculiar to itself; one formation furnishes red, another yellow or buff, another green or blue, and so on, each in itself being selected for its particular tint. They are often used together in various constructions and some very fine decorative effects are thus obtained. Mr. Ruskin in his "*Stones of Venice*" furnishes us with some remarkably fine examples of color-decoration in the form of stone and brick work.

Previous to the use of stained-glass the windows of churches had stone shutters or were filled with talc or alabaster. The windows in the apse of the Church of St. Miniato, at Florence, erected in 1008, are each filled with a slab of alabaster, which, when illuminated by the sun, admits a cloudy roseate light. Immediately that glass was used for windows the opportunity it afforded for decoration suggested itself and was freely taken advantage of. Specimens of work as far back as the twelfth century are still preserved, each example possessing a peculiarity of its own, and they are interesting as being early efforts in an art which in course of time attained such distinguished eminence, and was at length so completely identified with Christian architecture that no ecclesiastical structure was considered complete without having a free use of this transparent style of color-decoration. The Abbey Church, of St. Denis, in France, exhibits a perfect example of this decoration, dating from the beginning of the twelfth century.

The various resources of glass-staining are equally suitable for the decoration of public buildings and private dwellings, affording a rich adornment for the windows of halls and stairways and in many cases effectually screening objectionable sights. For these purposes simple and beautiful patterns of rich colors may be produced; figures, family events and ancestral achivements afford subjects for this kind of color-decoration. All stained-glass should be so used that it harmonizes thoroughly with the building in which it is placed. It should be correct in style, so colored that the eye can rest upon it without offence or weariness; its figures should have a good flowing outline, well drawn, pure in form and well defined, not gaudy in color but quiet in general tone, relieved here and there by brighter colors in smaller pieces, so that a quiet and rich appearance may be realized in the deeper-colored windows and in lighter ones purity and brilliancy, and in all cases conveying to the mind a sense of satisfaction and pleasure. Nearly one hundred and forty different tints of glass have been used in the production of a stained window. The fine old glass in Bruges and Chartres cathedrals were, however, composed of nine tints only.

Before closing this paper I will briefly touch the subject of domestic color-decoration, and in doing so would quote Mr. Ruskin, in which he says, "Whenever we leave Nature we fall immeasurably beneath her," and "that the beautiful is true." The decoration of a home should be in harmony with the size and situation of the house and its surroundings. A good photograph is better than an inferior painting; a growing plant is better than a bunch of artificial flowers, and by striving to copy from nature we draw nearer to the infinite and to that which is "a joy forever."

A home is a many-sided institution, and the influences which go out from it are subtile. Adornment need not necessarily mean an extravagant show; a beautiful house is not always made so by the largest outlay, for many an abode is made vulgar by the effort to show how much money could be put into the square foot of space. Tawdry colorings do not make a home which delights the eye or inspires the heart with the true sense of the beautiful. First to be considered is the comfort of the individuals of the household, and, secondly, to educate and please the eye with suitable color-decoration, harmony being the first requisite in our aim to copy nature's laws in the use of color.

A. ARTHUR COX.

ART IN AMERICA.

FOLLOWING are some portions of an interesting and striking address made by Brooks Adams at the joint annual dinner of the National Sculpture Society and of the National Society of Mural Painters in New York: —

"*Mr. President, Ladies and Gentlemen:* — My pleasure at meeting you here to-night is damped by my diffidence in attempting to address so distinguished an audience on any subject akin to art; and yet I find a consolation in the thought that perhaps even my words may be of some avail, since I hope I represent the body of our people, and it has ever been the function of the artist and the poet to give expression to the popular aspiration of their age.

"Fortune has led me toward a wandering life, and, like other wanderers, I am prone to compare the countries which I see. I am sure I do not err in saying that as year by year I return to Western Europe I mark a subtile change; the energy with which those nations palpitated when I was a boy is ebbing, and with the national vitality ebbs the national art. The form may survive, but the fire which quickened the form is flickering low. Each year on returning home I note the exact converse. Our society is gathering momentum, and as it surges onward our art gains dignity and scope. Well do I remember when our fathers thought this land a barren soil which could never nurture the architect and the sculptor, and yet, as I glance about me now, I see we lead the van. Since the mediæval Frenchmen tinted the rose of Rheims no such color has glowed in glass as in the windows of John La Farge; no nobler statues are carved than those conceived by St. Gaudens, while in power and technique no painting or etching excels that of Whistler and of Sargent. Lastly, in architecture we stand, in some respects, alone. In ingenuity and daring we have few rivals, but architecture is a great subject, and it is of that I chiefly wish to speak.

"Passing over such effects as those made at Chicago, which were ephemeral, and confining myself to durable monuments, I will take the new Library of Congress to illustrate my meaning. Now, I am a literary man; books are my trade, and in talking of a library I speak of what I understand. I affirm that as a workshop this building approaches perfection. It is ample, it is light, it is convenient, while in rapidity of service it can hardly be excelled. In the National Library of Paris it costs an hour to get a book; in the British Museum half an hour, in Washington five minutes. In Paris and London one works in dark and gloomy rooms, often crowded to excess; in Washington the reading-rooms are numerous, cheerful and comfortable. All this and more may be said of the practical side of this building; but is utility all that a nation may demand from artists? This year forms a grave epoch in our National life, and to-night I would speak gravely. I apprehend that we stand upon the brink of a new era, when a rising tide of National feeling will demand a more serious form of artistic expression, especially in our public monuments. I return to the Library to explain myself. The plan of the structure is good, but the plan of our building is apt to be but a skeleton — to find the lip we often have to seek the decoration. The habit of our artists is to speak through ornament, and, to me at least, ornament has been the reproach of American art. It has been the reproach because it has been redolent of money.

"How fashionable has it been to copy foreign masterpieces, without regard to their meaning, simply as a toy. Sometimes we have found a model in a Hindoo temple, sometimes in a Gothic shrine, and what has taken our fancy we have adapted to strange uses, as a savage adapts a white man's clothes. Our chief pre-occupation seems to have been to produce the effect of wealth, to exult in gold, and marble, and elaborate carving, only for display. Doubtless in the Library of Congress there are individual works of merit, but the whole lacks gravity and unity, and smacks of ostentation. If we have nothing more than this to say, no tale to tell save that we once were rich, then shall we leave nothing behind us which will endure. Those who follow us will forget us.

"Artistically our civilization will have failed. For my part, however, I believe that we have much else to say, and that the hour when you shall say it is at hand.

"We have only to look back into the mirror. Turn for an instant to Rome. The Romans, too, were rich and ostentatious; but what man of feeling has ever cared for the vulgar veneering of the baths of Caracalla or the tiers of bastard Greek pilasters, one above another, against art, the brick core of an amphitheatre? Posterity has recognized the coarse and sordid side of the Roman plutocrat, but happily in Rome there was something beside plutocracy. What extorted the admiration of our ancestors, and what extorts our own, is the sweep of the aqueduct striding across the Campagna, or the highway on which the legions marched, pointing straight to its goal, as inexorably as destiny. Whose heart has not kindled with enthusiasm before the arch which tells us of the nation's triumph or the column to commemorate the glory of the victor? These great works are as eloquent to us to-day as to the men who reared them, for they tell of passions which cannot be vulgarized, and they speak a language which shall never die.

"I ask you, American artists, have we no National life which fires your imagination and stirs your blood? I tell you this continent is quivering with an energy beside which the energy of Rome is as the

shock of the galley to that of the battleship. I feel it about me on every hand; our people are possessed with a premonition of their destiny.

"I was in Puerto Rico last February, and one sultry morning, strolling upon the ramparts of San Juan, I fell upon a regiment of regular infantry at drill. I suppose three-quarters of that regiment were volunteers of a few months' service; they did not look like any troops I ever saw; they were rough fellows in blue shirts and slouch hats, and they did not line up as regularly as I have seen men do in Germany and England. But I watched them finish their parade, and as they marched off the ground I knew that in all my life I had never felt such power.

"Only the other day I travelled from Pittsburgh to New York, and from New York to Albany, and in this whole round globe there is no sight which can compare. That great artery through which throbs the life-blood of this Nation is to what has existed elsewhere as the Hudson is to the Thames. We must accept the world as we find it. Probably mankind has lost the passionate devotion which created Chartres and Bourges; that magic instinct for form which was the heritage of the Greek has died, but one great emotion still remains to us; we have a country, and we have the sense of power which made the dignity and majesty of Rome. That is the emotion which is destined, if we survive and flourish, to be the dominant instinct of our land. That emotion shall, I trust, become incarnate through you.

"Gentlemen, it lies with you to give this passion, which I believe to be one of the noblest which can inflame the human mind, befitting expression; it lies with you to clothe the aspirations of your generation in color, in marble and in bronze; it is for you to conceive and execute memorials which shall commemorate our empire. And I, for one, believe in you, as I believe in our race, our soldiers, and our destiny, and I believe that when the hour of our decay shall come you will have raised to the honor and glory of your country monuments as eloquent and as strong as those which still make live before us the triumphs on the Tiber."

SOME NOTES ON THE PRESERVING AND FIREPROOFING OF TIMBER AND TIMBER SUBSTITUTES.

THE rendering of wood non-inflammable has received the attention of engineers and inventors at various times since the year 1625, but it is only of late years that a practical method has been devised. To make wood absolutely fireproof, it is essential that the fire-resisting treatment should permeate the heart of the wood, so as to render it internally as well as externally fireproof. In getting rid of the combustible elements from the wood cells, and substituting the fireproofing material, great care should be exercised not to rupture their delicate structure and so deteriorate the value of the timber.

A company is now at work, both in America and England, fireproofing wood for use in the construction of warships, and for many other purposes.

A series of experiments has recently been conducted on fireproofing wood in the United States, by the Assistant-Secretary of the Navy, which seems to indicate that wood preserved by the present-known methods must be limited to internal fittings. It is found that fireproof wood has a tendency to slightly corrode metal fittings, is somewhat heavier and harder to work than untreated wood, does not wear well, and absorbs water. Its retention of water and the effect of alternate wetting and drying are said to be very marked, and have been made the subject of a series of special tests. Fireproofing chemicals are found to wash out, or, in some way, to be destroyed, so that the wood becomes as combustible as ordinary timber, and, in certain ways, even more.

Works have recently been erected at Wandsworth Bridge, Fulham, and are equipped for rendering indestructible by fire large quantities of material. The wood to be treated is placed in cylinders, where, after its volatile and fermentible constituents have been given off, a fireproofing solution is applied under a pressure of 200 pounds per square inch. This operation takes about four hours. The timber is next dried in drying-rooms supplied with hot air, where it remains for a fortnight or more, after which it is ready for use.

The cylinders in which the wood is placed are 7 feet in diameter, and 25 feet to 75 feet long, the longest being 105 feet. The timber for treatment is stacked on small steel trucks, which are run into the cylinders.

Paynes introduced a process over fifty years ago, which consisted of enclosing the wood to be treated in a closed iron vessel, exhausting the air and allowing a solution of sulphate of iron to flow in. This at once thoroughly permeated the pores of the wood, after which a solution of muriate of lime was added; the double transference of these chemical compounds then took place, making sulphate of lime, or gypsum, and muriate of iron, the result being that the pores of the wood were filled with gypsum.

Another process has been worked out by Burnett, in which he used chloride of zinc.

Tungstate of soda has also been tried, but was found to unduly increase the weight of the wood, and to be too expensive.

Professor Pepper, after a series of careful experiments, determined that phosphate of ammonia gave excellent results.

Herr Hasselmann, of Munich, has devised a method of preserving wood sleepers, which is stated to have been used with success on the Bavarian State railways. The object is to produce a chemical union of the substances of the wood and preservative. The process consists in the double baking of the wood, and the treatment with oil of vitrol and sulphate of iron. It is afterwards placed in a bath of chloride of lime, to which milk of lime has been added at a temperature of from 100° to 125° Centigrade, with a pressure of 40 pounds per square inch. The first baking destroys the germs of fermentation, and induces the chemical union of the preservative with the fibres of the wood. The second hardens the wood, and so changes its character. It remains hard even when left in damp places. The whole process takes about six hours, and the cost is stated to be exceedingly small.

Haskin has patented a process which comprises a chamber into which the timber to be treated is run on rails, and in which are pipes with numerous perforations for the withdrawal of air. The ar is supplied from a compressor, and is heated by passing through a chamber filled with a coil conveying superheated steam. Storage-reservoirs are provided to regulate the supply of air to the vulcanizing-chambers. The whole system is worked by a circulating-pump. The object of this arrangement is to allow the gradual action of hot air on the timber, and its even distribution in the vulcanizing-chamber, as well as the gradual cooling of the chamber by the regulated admission of cold air into one or other of the storage-reservoirs, and the subsequent circulation of the cold air thus introduced throughout the system, in company with the remaining hot air. The chief feature of this process is to prevent the evaporation of the sap of the wood by introducing hot air into the vulcanizing-chamber under pressure.

Hely has proposed impregnating wood with a strong solution of calcium bisulphite, and then with a solution of caustic lime, so as to form a monosulphite, which is subsequently oxidized by the action of air to calcium sulphate, which is said to become practically part of the ligneous structure.

Another process has been patented for forcing a solution of dibasic or tetrabasic phosphate of lime and sulphurous acid into wood (from which the air has been exhausted) at a pressure of 6 to 8 atmospheres for about two hours. The wood is dried in a heated enclosed space to admit the recovery of the escaping sulphurous acid.

Messrs. Boudin and Donny conducted a number of experiments at Ghent University, but arrived at no very definite conclusions. The possible diminution of strength due to all injection processes must be taken into account, and all such substances as chloride of calcium, and other deliquescent substances, must be rigorously avoided. They also found phosphate of ammonia, on the whole, to give the best results. Where injection processes cannot be employed, Messrs. Boudin and Donny recommend the application of cyanide of potassium and asbestos paint.[1]

The following treatment of wood is alleged to render it incombustible without altering its appearance: Sulphate of zinc 55 pounds, potash 22 pounds, alum 44 pounds, oxide of manganese 22 pounds, sulphuric acid of 60°, Twaddel 22 pounds, water 54 pounds, are employed. All the solids are poured into an iron boiler containing the water at a temperature of 113° Fahrenheit. As soon as the substances are dissolved sulphuric acid is poured in little by little until all the substances are completely saturated. The wood is boiled for three hours in this mixture and then dried in the open air. The author has experimented with zinc sulphate, but the results are not satisfactory. If the fireproofing liquid is applied at too great a pressure the cells collapse and destroy the appearance of the wood.

Issel, of Genoa, has patented a composition for rendering wood incombustible. The composition consists of a solution of stated proportions of boric acid and potash alum, and, in the case of resinous woods, boric acid, oxalic acid, and potassium carbonate.

Lebioda has taken out a patent for an apparatus which embodies an injector, by means of which wood can be impregnated with solutions without the necessity of boiling, which is said to ruin the texture of wood. The apparatus consists of a compressing-chamber and a suction-chamber, which are superposed but separated by a perforated partition.

Gunn, of Bristol, has taken out a patent for the use of cresylate of either mercury, lead, copper, iron, or zinc; 100 parts of cresol are heated at a temperature between 80° and 100° Centigrade, with 120 parts of the oxide of any of the above metals, until a drop of the substance solidifies on cooling.

Incombustible paper has been made by mixing with the pulp a fluid obtained by adding to an aqueous solution 1¾ ounces of yellow tallow soap and just enough alum to completely decompose the soap.

Artificial wood has been devised by Geig. Six to eight parts, by volume, of peat are washed until the fibres are saturated, and mixed with two parts of plaster-of-paris and ten to twelve parts of water. The mass is moulded and subjected to hydraulic pressure and dried by means of a current of cold air. The product, when dried, may be oiled or coated with a solution of resin in alcohol. In order to prevent the rapid setting of the plaster glue may be added, together with chromate of potash, or other agglutinants may be substituted for the plaster. The composition is said to be readily worked in the same manner as wood.

Drying of Wood. — It has been estimated that green wood when cut down contains about 45 per cent of its weight in moisture, and

[1] "*Workshop Receipts*," Fifth Series.

in the forests of Central Europe wood cut down in the winter is said to hold 40 per cent of water until the end of the following summer. If kept in a dry place for several years wood contains 15 per cent to 20 per cent of water. That which has been thoroughly desiccated, when exposed under ordinary circumstances, absorbs about 5 per cent in the first three days, and will continue to absorb it until it reaches 14 to 16 per cent. It has been found that by exposing green wood to a temperature of 212° Fahrenheit the loss of weight would equal 45 per cent, and, further, on exposing small prisms of wood ½ inch square and 8 inches long, cut out of billets that had been stored for two years, to the action of superheated steam for two hours, the loss of wood was found to be from 15 to 45 per cent, according to the temperature of the steam.[1]

The composition of wood as determined by Gay-Lussac and Trenard is: —

	Oak, Per Cent.	Beech, Per Cent.
Carbon	52.53	51.45
Hydrogen	5.69	5.82
Oxygen	42.78	42.73

According to Dr. Prout, the oxygen and hydrogen are in exact proportions to form water. — *Sherard Cowper-Coles, in Engineering.*

SOCIETIES

SKETCH-CLUB OF NEW YORK.

THE last regular monthly meeting was held on Saturday, May 20th, in the Fine-Arts Building, at 215 West 57th Street. Through the courtesy of the Architectural League, these rooms have been procured for future meetings, as the old rooms of the Club have been permanently abandoned, being inadequate in size.

ADOLPH MERTIN, *Recording Secretary.*

ILLUSTRATIONS

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

DOORWAY: HOUSE OF MRS. RICHARD A. GAMBRILL, 30 PARK AVE., NEW YORK, N. Y. MESSRS. TROWBRIDGE & LIVINGSTON, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

HOUSE OF WILLIAM R. GARRISON, ESQ., TUXEDO PARK, N. Y. MR. WM. A. BATES, ARCHITECT, NEW YORK, N. Y.

DINING-ROOM IN THE SAME HOUSE.

BILLIARD-ROOM IN THE SAME HOUSE.

HOUSE OF HERBERT C. PELL, ESQ., TUXEDO PARK, N. Y. MR. WM. A. BATES, ARCHITECT, NEW YORK, N. Y.

FOUNTAIN OF S. COSIMATO, ROME, ITALY.

FOUNTAIN OF SAN MARCO, TOSCANELLA, ITALY.

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

UNION CHURCH, QUEEN SQUARE, BRIGHTON, ENG. MR. JOHN W. SIMPSON, ARCHITECT.

THIS plate is copied from the *Building News.*

[Additional Illustrations in the International Edition.]

NORTHWEST FRONT OF THE TOWN-HALL, BREMEN, GER.

[Gelatine Print.]

THE fine bronze equestrian statue, on a pedestal of reddish syenite, shown in front of the northwest façade of the town-hall, is that of the old Emperor William I, erected in 1893, after models by Robert Baerwald, a young and highly gifted sculptor of Berlin, who died prematurely in 1896. Born in 1858, near Bromberg, Province of Posen, Prussia, he received his art-education at the Berlin Academy of Fine-Arts and afterwards became a pupil of Prof. Reinhold Begas, whose influence is very noticeable in Baerwald's work. The seated female figure, with emblems of shipping and commerce, at the side of the pedestal, represents "Brema." There is also a splendid figure of Neptune on the opposite side of the base. The front of the pedestal is adorned by an eagle holding with tenacity the insignia of the newly-won German Imperial dignity.

[1] Dr. Ure's "*Dictionary of Arts, Manufactures,*" etc.

WEST FRONT OF THE CATHEDRAL, MÜNSTER, PRUSSIA.

[Gelatine Print.]

VIEW FROM THE SOUTH AISLE TOWARDS THE CHOIR OF THE CATHEDRAL, MÜNSTER, PRUSSIA.

[Gelatine Print.]

A MANSION IN QUEEN'S GATE, WEST, LONDON, ENG., MR. R. NORMAN SHAW, ARCHITECT.

ST. AUGUSTINE, PENDLEBURY, ENG. MESSRS. BODLEY & GARNER, ARCHITECTS.

NOTES AND CLIPPINGS

AUDITORIUMS AND ORATORY. — Mr. W. W. Tufts, of Cambridge, addresses the New York *Evening Post* in the following terms: In your editorial "Changes in Oratory" I do not find enumerated among the causes of decline the struggle with the hall, as depicted in an address by a specialist, Dr. Ephraim Cutter, "to the section on laryngology and otology, at the forty-ninth annual meeting of the American Medical Association, held at Denver, Col., June 7–10, 1898." He considers it a humane undertaking on the part of the doctors to call attention to the auditorium indisposition and the remedy for the disorder. The ailment in part is due to the architect and also to the speaker. The former, nine times in ten, has in view the auditor's eye rather than his ear, ornamentation rather than phonation. An instance, among countless ones, is that of the Albert Memorial Town-hall, at Leeds, with its "magnificent walls and pillars of polished variegated marbles." Though a "general visibility of the platform to the whole audience" is not neglected, under the prevailing conditions of intelligence among orators this hall encloses a space which the human voice fills with inarticulate echoes, and where the would-be hearers strain ineffectually for what is addressed to their intelligence. To cite a case in America, the hall in Saratoga is of bad repute for hearing. To the architect the lecturer urges two ways of getting at the remedy: 1. The concrete. Take auditoriums, he advises, which are easy to sing and speak in, and he instances that of the First Congregational Church in Woburn, Mass., which the architect, the late John Stevens, of Boston, "wanted to be his monument. He certainly favored the ear and eye both. There is not a seat of the fifteen hundred but commands a perfect hearing and view of the preacher or speaker at the pulpit." A well-known elocutionist "pronounced it to be the best auditorium for phonation he ever met with. Clergymen have testified to the same; singers also." "Major Ambrose Bancroft, master carpenter, Woburn, has given me (the lecturer) the following dimensions of the auditorium: Height of ceiling from floor, 34 feet 10 inches; width, 80 feet; length, 150 feet; width of side-galleries, 11 feet; width of rear-galleries, 14 feet." The key-note of this auditorium is F. Another example is "the chapel of the New York City Church of the Comforter." "The auditorium is 25′ x 50′, open to the roof; height of ridge-pole, 18 feet." 2. The ideal: "Study the nodes of the key of F, for example, and have the walls and height correspond to them." Sound the key-note, then, "walking in the direction of the long diameter of the auditorium, note when the tone is loudest and weakest." In the Woburn church the node of the key-note is about fifteen feet.

DUTCH VERSION OF WATERLOO. — Inasmuch as the young Queen of Holland is credited with a very keen sense of ridicule, one is tempted to ask oneself whether it is that sentiment or delicacy for the susceptibilities which has dictated her action in causing the removal of all the paintings relating to the battle of Waterloo which adorn the walls of many of the apartments of the palace of the so-called "House in the Woods," where the Peace Conference is to be held this month. The paintings in question are all painted in such a manner as to indicate that the Dutch contingent under the then Prince of Orange played not only a most gallant rôle but even the leading part in that historical encounter. Now every one knows that the Dutch did not shine at Waterloo, neither did the Prince of Orange. The latter was so drunk during the course of the battle as to give rise to the expression of "Dutch courage," while his Dutch troops, like his worthy Belgians, bolted, one of the most amusing accounts of their attitude of that day being found in Thackeray's "*Vanity Fair.*" So, with the view of righting themselves, if not in the sight of their contemporaries, at any rate in the eyes of posterity, the Dutch troops who had taken part in the battle clubbed together and presented to their Prince and General the palace of "The House in the Woods," as a token of their admiration for the alleged heroism which he had displayed on the field of battle, while William, in return, adorned the walls of this palace, which had previously belonged to the States General, with war pictures, painted with the express object of showing the very prominent part which the Dutch claimed that they played in the encounter. The spectacle of these paintings would not be conducive to the gravity and solemnity of the Peace Conference, so they have been all removed. The reason given by the Dutch papers, however, for the action of the young Queen in the matter, is that "these suggestions of war and victory might offend susceptibilities and likewise divert the delegates from the proper consideration of the object which they have in view, namely, peace." — *Marquise de Fontenoy in the Philadelphia Press.*

SCHOLARSHIPS IN ARCHÆOLOGY. — The American School for Classical Studies at Rome has appointed to the two fellowships in Classical archæology, George Dwight Kellogg, A. B., of Yale and Grand Showerman, A. M., of the University of Wisconsin. The fellowship in Early Christian Archæology was awarded to Walter Lowrie, who held it two years ago. — *Exchange.*

Travelling Scholarship of the T-Square Club. — A travelling scholarship in architecture is to take the place of the gold medal awarded annually by the T-Square Club for the best average for the year's work. The officers of the T-Square Club will send the prize winner abroad to extend his studies. The following have been asked to act as a committee: Prof. Warren P. Laird, Walter Cope, and Albert Kelsey, to outline the conditions which shall govern these competitions and to prepare a series of programmes, etc. — *Philadelphia Press.*

A thrice-successful Competitor. — An open competition was recently announced at Eisenach for one of the innumerable statues which are springing up like mushrooms all over Germany to the memory of the late Prince Bismarck. About three hundred competitors took part, and submitted more than one thousand designs, and the duty of the committee was to select the best three designs, without reference to the names of the artists. When these three had been chosen and the accompanying envelopes opened, it was found that all three designs had been submitted by the same sculptor, Herr Kreiss, of Dresden, a result probably unprecedented in such competitions. — *N. Y. Tribune.*

Failure of a Test in the Indiana Gas-belt. — Men regarded as experts in the matter of natural gas have contended that exhausted gas territory would, after a long rest, yield the coveted fuel again in paying quantities. This theory has received a setback by a test at Kokomo, Ind. No gas-wells have been drilled in Kokomo for eight years, and this field has been looked upon as a fair test of the theory of revivification. Two weeks ago William Moore, a manufacturer of that city, began drilling a well in the geographical centre of the corporation, he having faith that in the long interval of rest gas had again accumulated in the gas-rock stratum. The well was finished a week or so ago, and, to the great disappointment of the drillers and all concerned, not a vestige of gas was found. The flood of salt-water that rushed up from the hole did not even bring with it the slightest smell of gas. It is now believed that ground once thoroughly gone over is exhausted for good and all. The manufacturers are especially chagrined over the failure. — *N. Y. Evening Post.*

The Leighton Bequest. — The last wish expressed by Lord Leighton on his death-bed was that his sisters should give the sum of £10,000 to the Royal Academy. This munificent bequest was duly fulfilled, the money being handed to the Academicians free of all conditions as to its use. After two years' consideration a decision concerning it has been arrived at, which is, perhaps, the one best calculated to commemorate the name and work of the late President, says the *Magazine of Art.* The following is the resolution adopted by the Academicians when settling the matter: "That the money received from Mrs. Orr and Mrs. Matthews, sisters of Lord Leighton, P. R. A., in memory of their brother, be invested in consols or other securities allowed by law, as a separate trust fund to be called 'The Leighton Bequest.' That the income derived from this fund be spent in acquiring or commissioning works of decorative painting, sculpture, and architecture. The paintings to be placed in public institutions; the sculpture, in or on public buildings and in the open air, such as in parks, squares and streets; the architecture, alone or in combination with sculpture, to be in the form of fountains, seats in marble, bronze, or stone, lamp-posts and similar objects for the adornment of public places. The income of the fund not necessarily to be spent annually, but, if thought desirable, reserved for a period not exceeding five years." The scheme is a most comprehensive one, and, as will be noticed, does not repeat the drawbacks of the Chantrey bequest, inasmuch as works may be specially commissioned by the administrators of the fund; and, further, the reservation of the income for a time will afford an ample sum for any work of special importance which it might be desirable to commission. The academy is to be congratulated upon its decision. But it is cheap enough to honor the President at the President's own expense; and we see with great regret that no Academician has thought it wise or proper to assist in the foundation of Lord Leighton's house as a permanent memorial and museum, which has been instituted in accordance with the wish, and by the means of the bounty of his sisters. The Leighton House will henceforth be the true, popular, living memorial of the artist, and in that the Academy has no hand. — *Exchange.*

Pure Air and Water for Paris. — There really seems to be a reasonable hope that visitors to the Exhibition next year will find the capital traversed by a limpid river instead of by the foul, muddy and malodorous stream that has been an offence to the eye and the nostrils for a long time past. Fair promises of a Seine that should no more be a recipient of sewage have been held out so long by the city authorities that Parisians had almost left off counting on their realization, but at last the interminable delay is understood to be nearly over. In reality the delay was inevitable, as the work to be accomplished was not only gigantic, but had to be carried out in the face of the bitterest opposition. The entire sewage of the metropolis has hitherto gone into the Seine. From July onward none of it will be disposed of in this most undesirable way; it will all pour into one huge central drain and be carried off to two immense suburban sewage-farms, situated respectively at Méry and Trial. A large portion of the Méry farm is already in working order, and was officially visited a day or two ago by the Municipal Delegates. Méry is a high-lying sandy plain, known to the local inhabitants as the Sahara of Paris With the help of the sewage it is to be converted into pasture-land, and it is hoped that when thus changed this desert will aid in the solution of the problem of supplying the capital with pure milk. A few years ago such expectations would have been scoffed at, but the results obtained with the sewage-farm already in existence at Gennevilliers have converted the most hardened sceptic. In fact, the inhabitants of Gennevilliers, whose land has gone up enormously in value, have just erected a statue to Durand-Claye, who caused the new system to be applied, and whose life was threatened by his fellow-citizens when first he proposed the innovation. One of the land-owners whose property was to be taken by the Trial farm demanded 10,000,000 francs damages, and that sum was positively accorded him by the jury of the local court. On appeal the amount was reduced to 100 francs, but the original figure is an indication of the hostility the scheme aroused in the first instance. The purification of the Seine is not the only step that is on the eve of being concluded in the direction of ridding Paris of the abominable odors that disgrace it in summer. Before long the refuse carted away by the dust-collectors will cease to be spread over the fields and market-gardens of the suburbs. The municipality has at length decided to treat this evil-smelling *gadoue* on a new system, and the wind will cease to waft us back the the choicest scents of our dust-bins. — *Paris Letter to the Pall Mall Gazette.*

Blasting with Steam. — Blasting with high-pressure steam, instead of the usual inflammable explosives, is a proposition made recently by Mr. H. Schaw before the Institution of Mining Engineers of Great Britain, says *Cassier's Magazine.* Briefly, his suggestion, which has been prompted more particularly by accidents in coal-mines from coal-dust ignitions due to the use of the customary explosives, is that a cartridge of water, lodged in a shot-hole, should be converted into steam at a pressure of about 150 pounds per square inch by means of electricity of low tension, and the cartridge or boiler to be made of such strength that it would burst at about this pressure, when the force set at liberty would break down the coal. Mr. Schaw found by experiment that it would be easily possible to boil water by the heat produced by a current of electricity passing through a platinum wire similar to that used for firing mines immersed in water, and is of the opinion that at the moment when the boiler or cartridge bursts the wire will fuse and the electric circuit will be broken, and no risk of ignition of fire-damp or coal-dust will remain from the heated wire. Under the supposition that the force developed by the water cartridge would be sufficient to break down the undercut coal in a mine, Mr. Schaw thinks that the practical working of the proposed method would present no great difficulties, and that it would be perfectly safe in any coal-mine; and this is its only recommendation, for it certainly would be more expensive and troublesome than the usual methods of blasting. — *Boston Transcript.*

A New Tax on Italian Tourists. — Visitors to Rome will learn with interest the determination of the authorities to make an entrance-charge to the ruins of the Forum. Considering the needy state of the Italian exchequer, it is somewhat astonishing that this expedient for "raising the wind" has not already been resorted to. For years the entrance to the adjacent hill, the Palatine, where, huge and gloomy, are the ruins of the palaces of the Cæsars, has only been gained by the payment of a lira; but hitherto the stranger could pass under the arch of Septimius Severus and along the Via Sacra without let or hindrance. Recently, however, so many new treasures have been excavated in the Forum that the Minister of Fine-Arts might feel himself justified on that score in making visitors pay tribute to Cæsar. The reason, however, is to be found elsewhere. Jealous of the constant carrying-away of the art treasures of the country, the Italian Parliament years ago passed a law forbidding their export. Thus when the treasures of the Villa Borghese, which stands so pleasantly on the Picino, were offered for sale, there were no purchasers, for no individual Italian was found with capital enough to become the owner of these famous pictures and statues. Now, however, the Italian Government has purchased them, at the price of £280,000, and in order to recoup themselves for the outlay has determined to make a charge for admission to the Forum. In one way or another strangers, and especially the English and American tourists, find a goodly sum towards the revenues of Rome. — *St. James's Gazette.*

View of a Hacienda House. — The house of a great hacienda is imposing in appearance, on account, usually, of its size rather than of its architectural proportions. It is generally built around a large court, and, whether of one or two stories, conveys the impression of having been erected solely with a view to durability and spaciousness. The construction is invariably of stone or sun-baked bricks, plastered and painted, and, in most cases, presents an even elevation, broken only by grated windows, a *porte-cochère* and loop-holes for musketry. This structure contains the offices, apartments for the owner, for the two or three principal employés and their families and for the servants, storerooms, stables for saddle and carriage horses, carriage space and an indefinite number of spare rooms, according to circumstances. Conveniently situated in relation to the main building are the habitations of employés, the huts of the peons, sometimes the posada or inn, for the accommodation of travellers, the church (which usually is a pretentious structure), the store, where every commodity of peasant life is for sale, the vast stables for horses, mules and oxen, storehouses for the produce of the hacienda, and others for agricultural implements, the wheelwright, blacksmith and carpenter plants, the saddler's and cobbler's shops, the loom, the bakery — in sum, all the attributes of a village, which an hacienda of this class is, practically, having a population of from 500 to 1,500 inhabitants. — *Prince A. de Iturbide, in North American Review.*

Pile-driving made Easy. — The use of the water-jet in pile-driving has long been known, but some Russian engineers have worked out a method of pile-driving which makes the pile sink three or four times more quickly than by the old method. Gas-pipes lead down to the lower end of the piles. At the top gutta-percha pipes are attached, through which air under seventy-one pounds' pressure is forced. This clears the way for the pile to be easily driven. When down far enough the gas-pipe is lifted off and out and attached by staples to the next pile. — *Boston Transcript.*

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The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

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THE OLD STYLE'S BURDEN.

(*With apologies to Rudyard Kipling.*)

Take up the Old Style's burden —
  Send forth the stuff ye breed —
Go, bind those brands to exile
  That serve dishonor's greed;
To waste, unsold, forgotten,
  Through competition wild —
Your full-fledged imitations,
  With truth irreconciled.

Take up the Old Style's burden —
  In patience to abide,
To shield the trade from error
  And thrust deceit aside;
By honest ways and open,
  To expose the brands, that fain
Would seek another's profit
  And steal another's gain.

Take up the Old Style's burden —
  Each claimant's fresh caprice —
Bewilders buyer — architect —
  And bids the contest cease;
For when your sale is nearest
  (The end by others sought)
"The Equals!" — worse than folly —
  Bring all your hope to nought.

Take up the Old Style's burden —
  With all the cares it brings;
With rack of brain and trouble —
  The fate of worthy things.
The cost ye shall not enter,
  The roofs ye shall not tread,
Go, tin them for your living,
  To last when you are dead.

Take up the Old Style's burden —
  And reap its just reward —
The thanks of those ye better,
  The hate of sham and fraud —
The cry of those converted
  (Ah, slowly!) toward the light;
Who know the Taylors' trade-mark —
  Its guaranty of right.

Take up the Old Style's burden —
  Ye dare not use a less —
Nor call too loud on others
  To cloke your thoughtlessness.
By all ye wish or covet,
  By all ye say or do,
The silent, sullen weather
  Shall judge your roof and you.

Take up the Old Style's burden!
  Have done with childish ways —
The long-neglected laurel,
  The deep-begrudged praise —
Comes now to greet your efforts,
  Through all the thankless years,
And crowns with dear-bought wisdom
  The judgment of your peers.

THE Berlin Iron Bridge Co., of East Berlin, Conn., are putting up a new machine-room for the Ducan Co., at Mechanicville, N. Y. The building is 72 feet wide, 170 feet long, the roof-trusses being arranged with trolley-beams and hoists, so that the rolls of paper can be lifted in and out of the machines by power.

OFTEN UNCONSIDERED, BUT NEVERTHELESS IMPORTANT.

SPACE in factories is valuable; the time of employés is likewise valuable, and if a moment can be saved on things which are frequently done in the course of a day the net result during a year amounts to quite a number of hours. For example, if there are quite a number of doors which swing only one way time is wasted in stopping to pull the door open, leaving only one hand free for carrying any thing; whereas if double-action "Bommer" spring-hinges were used a mere push with the foot would suffice to open the door, when coming or going in either direction, leaving both

hands for carrying, thus saving time of employés who have occasion to pass from one room to another.

"Bommer" spring-hinges are made of steel, either japanned or plated; they are extremely durable and reasonable in price. They avoid danger in case of panics, as the doors will open whichever way the crowd pushes against them. The World's Fair Award of 1893 says they are "practically unbreakable"; and these spring-hinges received the Gold Medal Award at the Omaha Exposition, in 1898. They can be obtained from all hardware dealers. Bommer Brothers, Manufacturers, No. 257 to 271 Classon Ave., Brooklyn, N. Y.

B. B. WHITE-LEAD.

IF you use white-lead for painting your buildings, you should use the *whitest* lead, the *finest* lead, and the lead that will *last* the longest.

B. B. Lead has been an acknowledged standard for fifty years, for whiteness, fineness, and lasting qualities. Painters testify to this. When they want to do an especially good job of lead-painting they use B. B. Lead.

B. B. Lead is so finely ground that it takes two gallons more oil to a hundred pounds than does ordinary white-lead.

Linseed-oil is the life of a paint. B. B. Lead with this large amount of oil is the most lasting lead.

A house that is painted with coarse paint presents a rough surface, affording a lodgment for dirt, mildew and dust to collect, and for dampness to gradually disintegrate.

A fine lead on a house makes a smoother and glossier job. Dust, mildew and dampness cannot hold on a smooth, glossy surface. This is another reason why B. B. Lead will last longer and look better than ordinary lead.

B. B. Lead is ground in aged English linseed-oil — an important factor in the lasting quality of the paint.

In painting a building the labor of putting on the paint is seventy-five per cent of the whole cost of the job.

It costs no more to put on good paint than poor paint.

The better a paint is the longer it will last. B. B. Lead costs a little more than ordinary lead, but it will last longer; it is, therefore, more economical and more satisfactory in the end.

English B. B. White-Lead is packed in iron cans of 28 and 56 pounds each, gross weight, and in wooden kegs of 112, 224, 336 and 560 pounds each, net weights. It can be obtained from all paint dealers and from the sole importers, the F. W. Devoe & C. T. Raynolds Co., 101 Fulton Street.

F. W. DEVOE & CO.,
NEW YORK, N. Y.

BOSTON, May 23, 1899.

As an instance of the general acceptance of our construction by the leading architects of the country, in some cases for economy, in some for effect, and always for stability, we note that in the current Catalogue of the Architectural Exhibition, Boston Architectural Club and Boston Society of Architects, that out of the relatively few fireproof buildings illustrated therein our system was applied in six of them.

In the catalogue of two years ago we observe that there were illustrated five different buildings containing our construction.

R. GUASTAVINO CO.

LA CAPITAL TRAMWAY CO., of Buenos Ayres, Argentina, have placed an order with the Berlin Iron Bridge Co., of East Berlin, Conn., for a steel water-tower, supporting a tank having a capacity of 7,000 gallons. This is the fifth order the Berlin Iron Bridge Co. have received from this company.

(*Continued on page* 4.)

A 300% INVESTMENT.

(*Reprinted from The American Engineer of June* 12, 1889.)

The Value of Covering Steam-pipes. — In the Michigan Engineers' Annual, which is a report of the proceedings of the Michigan Engineering Society, of January, 1889, Prof. M. E. Cooley, M. E., of Ann Arbor, gives the following report of his experience as to the Value of Covering Steam-pipes:

"The benefit of Covering Steam-pipes to prevent radiation is strikingly illustrated by the following example: The Thomson-Houston Electric Light Plant in Ann Arbor has about sixty feet of seven-inch pipe connecting the boilers with the engines and two large steam-drums above the boilers. In March, 1887, the steam at the far end of this pipe was tested, to determine the amount of entrained water, the pipes and drums at the time being uncovered. An average of nine experiments gave 31.01 per cent moisture. In June of the same year, after the pipes were covered with Magnesia Sectional Coverings, the quality of the steam was again tested, the average of five experiments giving 3.61 per cent moisture; the tests were made by the same men from the same connections, and in the same manner. The pipes and steam-drums in March were subjected to a draught, which, of course, aided the condensation. Enough water passed into the cylinders to retard the engines, producing a disagreeable noise. In June the weather was warmer and the pipes and steam-drums were well protected. The quality of steam at the boilers was tested in June, and showed about three per cent moisture. Assuming that 100 I. H. P. were being developed at the time, and that each horse-power required thirty pounds of steam, then, if the steam is assumed to have twenty-five per cent entrained water, due to condensation in the pipes and connections, 4,000 pounds steam will need be produced in the boilers, or 1,000 pounds more than necessary. To produce this steam will require about 125 pounds of good coal per hour, or 1,000 pounds per day of eight hours. One-half ton per day, at $3.00 per ton, for 300 days, $450, which, at six per cent, pays the interest on $7,500. The actual cost of the covering, put on complete, probably did not exceed $150." For estimates or other information address

THE KEASBEY & MATTISON CO.,
AMBLER, PA.

NOTES.

Merchant & Co., Inc., of Philadelphia, New York and Chicago, report, in their smelting department, an active demand for their Iridium Anti-Friction Metal. This is a peculiar alloy of the Babbitt-Metal class, which is very much like the famous Parsons English Mixture, which has been used in heavy machinery and steamship work for a great number of years. The above firm, after extensive experiment and tests, put this mixture on the market a number of years ago, and time has only given full proof of its merits. It is a coarse-grained, very white, light, and extremely tough material, which is equal to brasses in its endurance and anti-frictional qualities, but which can be much more easily used, as it can be melted in the ladle and poured into the boxes, instead of being cast and filed to fit, as is necessary with brasses.

This company sells every grade of Babbitt Metal, but gives the advantage of their long and extensive experience in this line to their customers in supplying them with the grade and character of Babbitt Metal that their wants require.

All users of this material will find it to their interest to communicate with this well-known company before placing their orders for Babbitt Metals.

The contracts for the bridges on the line of the Shelton Street Railway Co. have been let to the Berlin Iron Bridge Co., of East Berlin, Conn. These bridges consist of what is known as "Peck's Mill" bridge, which is a deck construction, having four 130-foot riveted-lattice spans, and three plate-girder spans, about 40 feet each. The total length of the bridge is 654 feet. The trestle for the South End Land Co. consists of one 130-foot-riveted lattice-span, one 30-foot and one 60-foot plate-girder span, making a total length of 220 feet. Besides these there are two plate-girder spans, one of 60 feet, over Far Mill River, and a bridge in the town of Shelton, which answers as a highway bridge, as well as a crossing, which carries the street-railway tracks.

We have recently prepared and are sending out three treatises on Tin-roofing, well worthy of consideration by architects, engineers and every one interested in this material.

The first thoroughly explains "How Roofing-tin is Made."

The second tells "How a Tin Roof should be Laid and Painted."

The third shows in detail the difference of our method of manufacturing plates from the old Welsh method, and the reasons for claiming superiority for our method.

These pamphlets will be sent to any one sufficiently interested in the matter to address a request on a postal-card to us at any of our offices.

MERCHANT & CO., INC.,
PHILADELPHIA, PA.

The Providence Gas Co. will make large additions to their plant during the present season, and have placed contracts with The Berlin Iron Bridge Co., at East Berlin, Conn., for a new meter-house 65 feet wide, 110 feet long, a purifier house 40 feet wide, 175 feet long, and three stories high; and also for a gas-holder building, 184 feet in diameter. The entire construction will be steel frame-work, absolutely fireproof.

The protection of iron and steel used in modern architecture is a subject that requires careful consideration and the paint selected should be one that has effective rust-preventing properties. Harrison Brothers & Co., Inc., have in their "Antoxide" a preparation that is unequalled for this purpose; it will withstand great changes of temperature and is suitable for all kinds of iron and steel work exposed to deleterious gases and the elements.

Hendey Machine Co., of Torrington, Conn., are building a new engine-room, 40 feet wide and 60 feet long. The side-walls are of brick; the roof has steel trusses with corrugated-iron covering, supported on steel purlins. A large ventilator extends along the ridge of the roof. The corrugated-iron is lined with the Berlin Iron Bridge Company's Patent Anti-Condensation Lining. The Berlin Iron Bridge Co. furnish and erect the steel frame-work and covering.

BUILDING INTELLIGENCE.

Reported for the American Architect & Building News.

HOUSES.

Philadelphia, Pa. — *Waterloo St.*, nr. Mascher St., 30 two-st'y bk. dwells., 14′ x 26′ x 40′; $33,000; o. & b., D. C. Schuler & Son.

Tulpehocken St., nr. Main St., Germantown, three-st'y st. dwell., 57′ x 61′; $20,000; o., F. W. Tunnell; b., Sam'l Harting; a., Rankin & Kellogg.

Thirteenth St., nr. 65th Ave., Oak Lane, three-st'y st. dwell., 36′ x 40′; $6,000; o., Jacob Schiffhauser, 1741 Park Ave.; b., T. Frank Miller.

Bancroft and Wolf Sts., nr. 16th St., 16 two-st'y bk. dwells., 15′ x 38′, 16′ x 49′, 16′ x 51′ & 18′ x 52′; $22,000; o. & b., Michael Whelan.

Pittsburgh, Pa. — *Climax St.*, cor. Walter Ave., three-st'y bk. dwell., 28′ x 45′, slate roof, hot water; $5,000; o., Mrs. Jane Sheck; a., J. A. Long, 412 Park Building.

St. Louis, Mo. — *Berlin Ave.*, nr. Taylor St., two-st'y bk. & st. dwell., 32′ x 34′, slate & tile roof; $15,000; o., Chas. Lindenschmit; a., Deitering & Klipstein, De Soto Building.

Von Verson Ave., 7 three-st'y bk. & st. dwells., 23′ x 34′, slate roofs, furnaces; $30,000; o., Brown Realty Co.; a., J. B. Legg, Koken Building.

St. Paul, Minn. — *Summit St.*, nr. Albert St., 2½-st'y bk. dwell., 36′ x 56′, furnace; $6,000; o., Joseph M. Dickson; b., O. H. Alm, 29 E. 7th St.

Laurel St., nr. Victoria St., two-st'y fr. dwell., 28′ x 42′, furnace; $5,000; o., Miss L. Burgess, 80 Iglehart St.; b., A. Koerner, 641 Winslow St.

Washington, D. C. — *Eleventh St., No.* 1737, three-st'y bk. & st. dwell., 16′ x 71′, hot water; $5,200; o., Robert W. Brown.

Thirteenth St., No. 1824½, three-st'y bk. dwell., 20′ x 33′; $6,000; o., D. B. Groft.

Quincy St., bet. 8th & 9th Sts., 20 two-st'y bk. & st. dwells., 16′ x 60′, flat roofs, steam; $60,000; o., Adam McCandlish.

Worcester, Mass. — *Mendon St.*, three st'y fr. dwell., 28′ x 44′; $5,000; o., a. & b., John E. Doyle.

Ingleside Ave., three-st'y fr. dwell., 37′ x 58′; $5,000; o. & b., W. A. Beaudette.

Circuit Ave, two-st'y fr. dwell., 35′ x 38′; $4,500; o., Arthur E. Gray; a., C. F. Wesson; b., M. L. & L. M. Hall.

Vincent St., two-st'y fr. dwell., 27′ x 36′; $4,000; o., W. A. Warden; a. & b., M. L. & L. M. Hall.

May St., 2½-st'y fr. dwell., 28′ x 32′; $3,000; o. & c., J. J. Powers.

Fairbanks St., three-st'y fr. dwell., 28′ x 52′; $3,500; o., August Weyren; b., L. M. Peterson.

Belmont St., three-st'y fr. dwell., 27′ x 58′; $3,500; o., Etienne Leclair; c., Dorais & Dupuis.

Hancock St, two st'y fr. dwell., 26′ x 37′; $3,000; o. & a., Alonzo Caswell; c., Joseph Tetreault.

Cleveland Ave., two-st'y fr. dwell., 25′ x 47′; $5,000; o., Thomas Olney; a., W. H. Harvey; c., W. G. Warren.

OFFICE BUILDINGS.

New York, N. Y. — *West St.*, cor. Beach St., four-st'y bk. store & offices, 90′ x 100′; $125,000; o., John T. Williams, Stamford, Conn.; a., J. T. Williams & J. T. Williams, Jr., 27 William St.

Broadway, cor. Cedar St., sixteen-st'y st. office-building, 40′ x 100′; $400,000; o., American Exchange Nat'l Bank, 128 Broadway; a., Clinton & Russell, 32 Nassau St.

Fifth Ave., No. 244, eleven-st'y iron & st. office-building, 31′ x 85′ & 90′; $150,000; o., Andrew J. Connick, 220 Fifth Ave.; a., Rob't Maynicke, 725 Broadway.

Worcester, Mass. — *Bloomingdale Road*, one-st'y bk. & granite office-building, 61′ x 78′; $10,000; o., W. M. Spaulding; a., C. H. Lincoln; c., Webb Granite & Construction Co.

PUBLIC BUILDINGS.

Elwood, Ind. — Three-st'y bk. & st. City-hall, slate & copper roof, steam; $30,000; o., City; a., J. F. Alexander & Son, Lafayette.

Lincoln, Neb. — Two-st'y st. Court-house, slate roof, hot water; $20,000; o., Lancaster County; a., C. W. Squires, Emporia, Kan.

Statesville, N. C. — Three-st'y bk. Court-house, 86′ x 89′, slate roof, steam; $20,000; o., Iredell County; a., Hayden, Wheeler & Schwend, Charlotte.

WAREHOUSES.

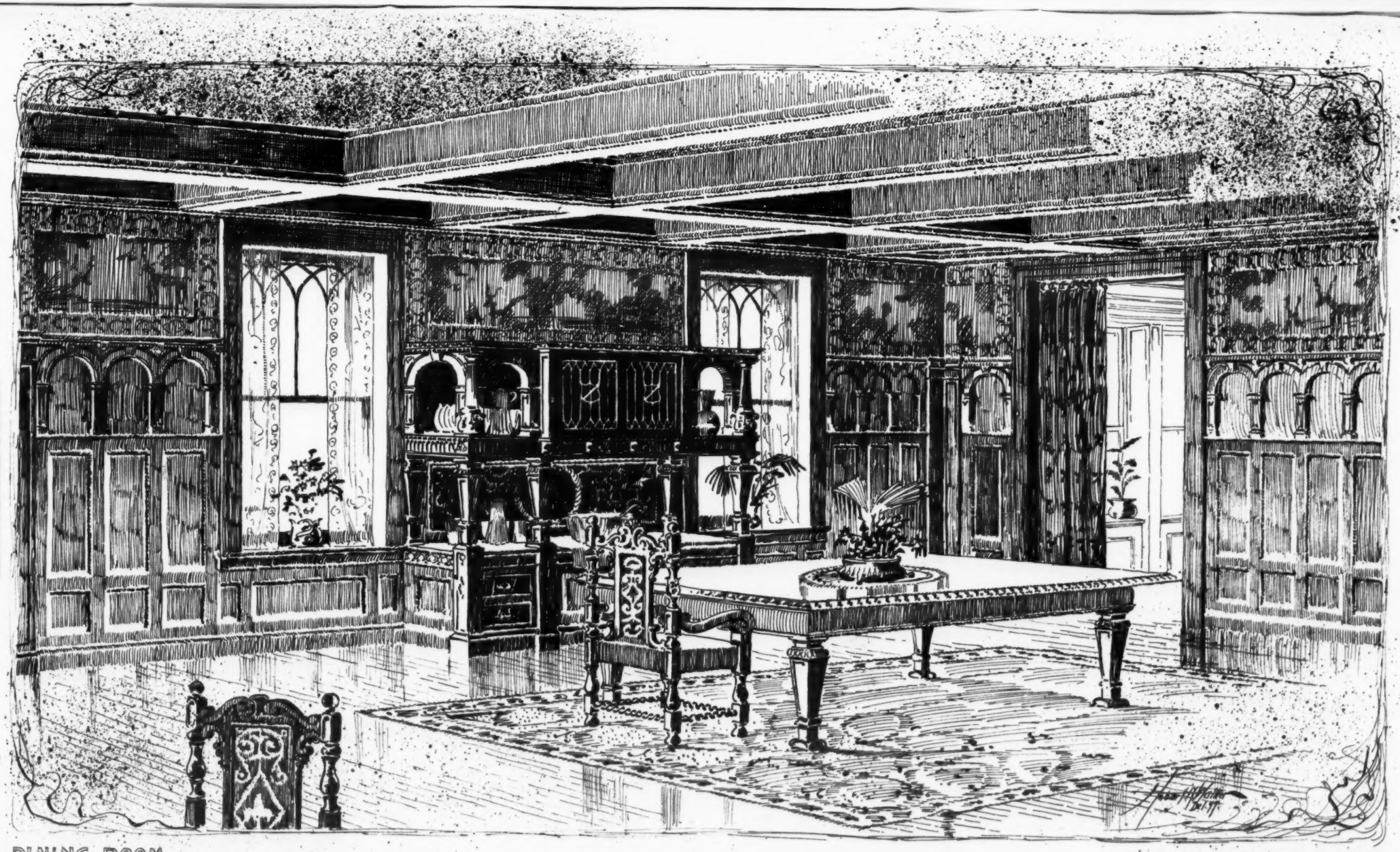
Boston, Mass. — *Beverly St.*, nr. Causeway St., Ward 8, four-st'y fr. storage building, 30′ x 390′, flat roof; $8,000; o. & b., Fitchburg, R. R.

Worcester, Mass. — *Quinsigamond Village*, two-st'y bk. & granite storehouse, 86′ x 228′; $11,000; o., American Steel & Wire Co. (Washburn & Moen Mfg. Co.). Plans by the company's engineer.

MISCELLANEOUS.

Columbus, Ga. — Three-st'y bk. & st. Masonic Temple, 60′ x 140′, gravel roof, steam; $30,000; o., Masons of Columbus; a., W. F. Denny, Atlanta.

Windsor, Ont. — Three-st'y & base. chemical laboratory, 100′ x 120′, comp. roof, steam; $25,000; o., Fred Stearns & Co., cor. Porter & 23d Sts., Detroit, Mich.; a., Stratton & Baldwin, 1103 Union Trust Building, Detroit, Mich.



No. 1223

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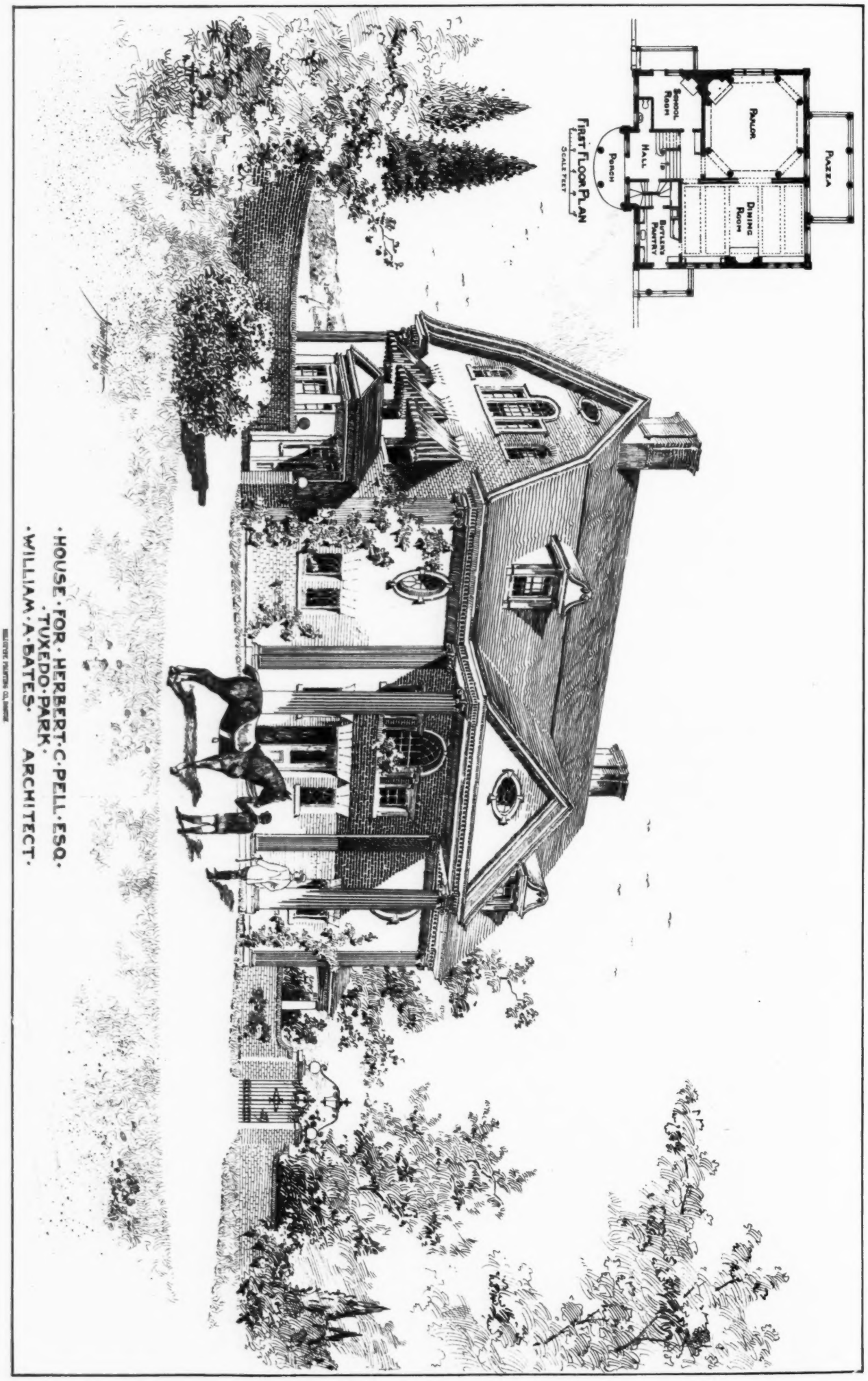

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Fountain of S. Cosimato: Rome, Italy.

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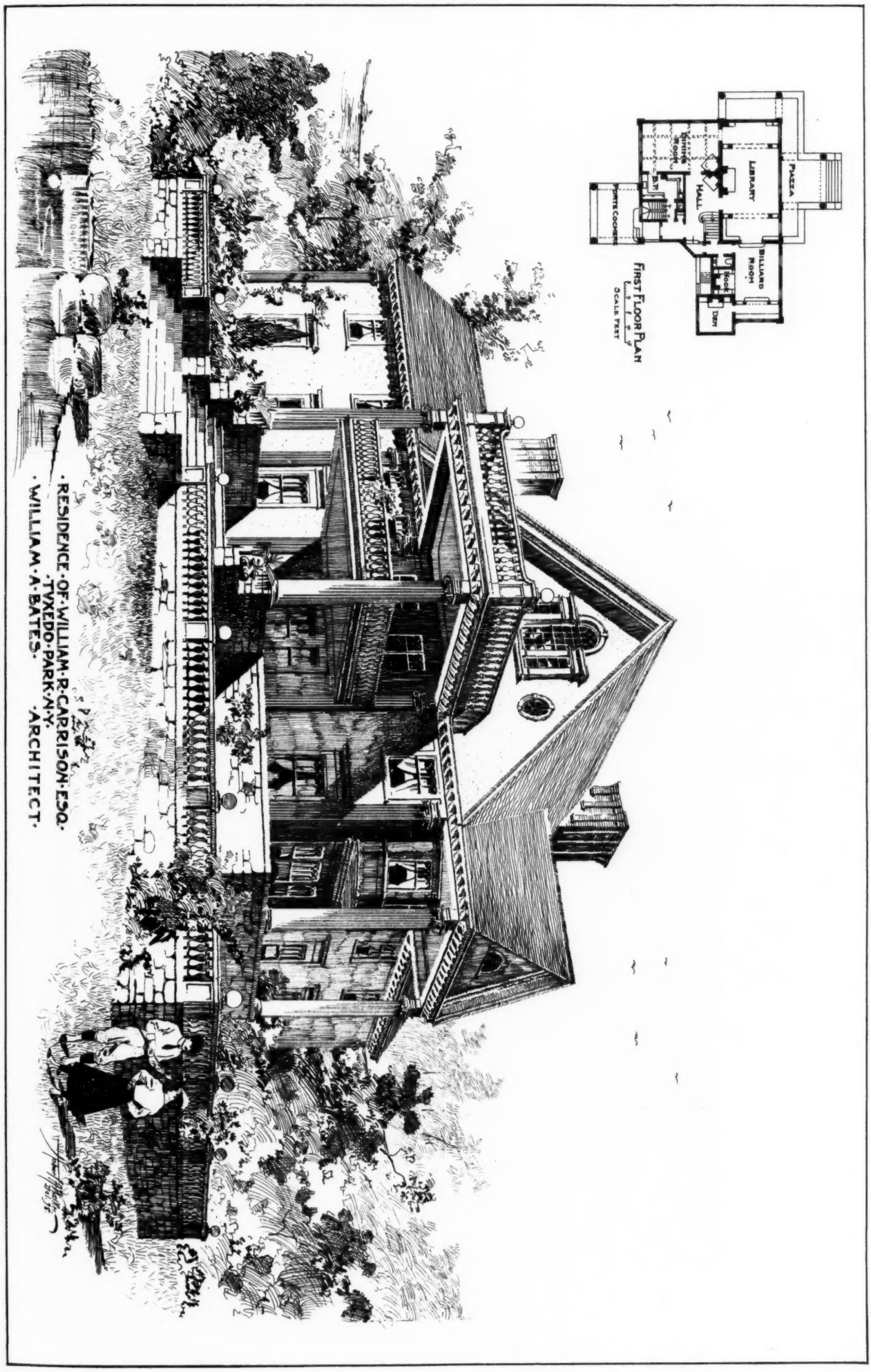

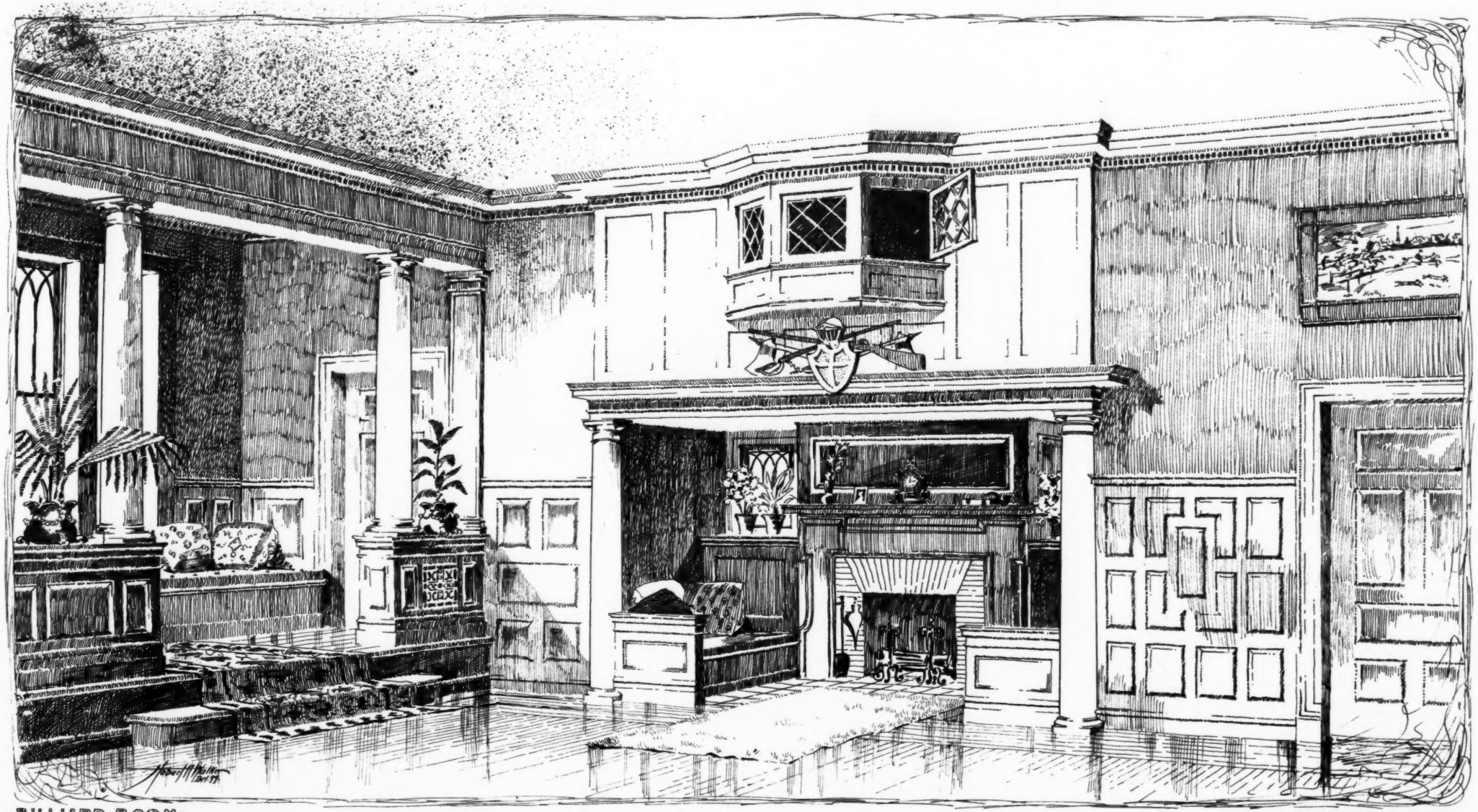

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