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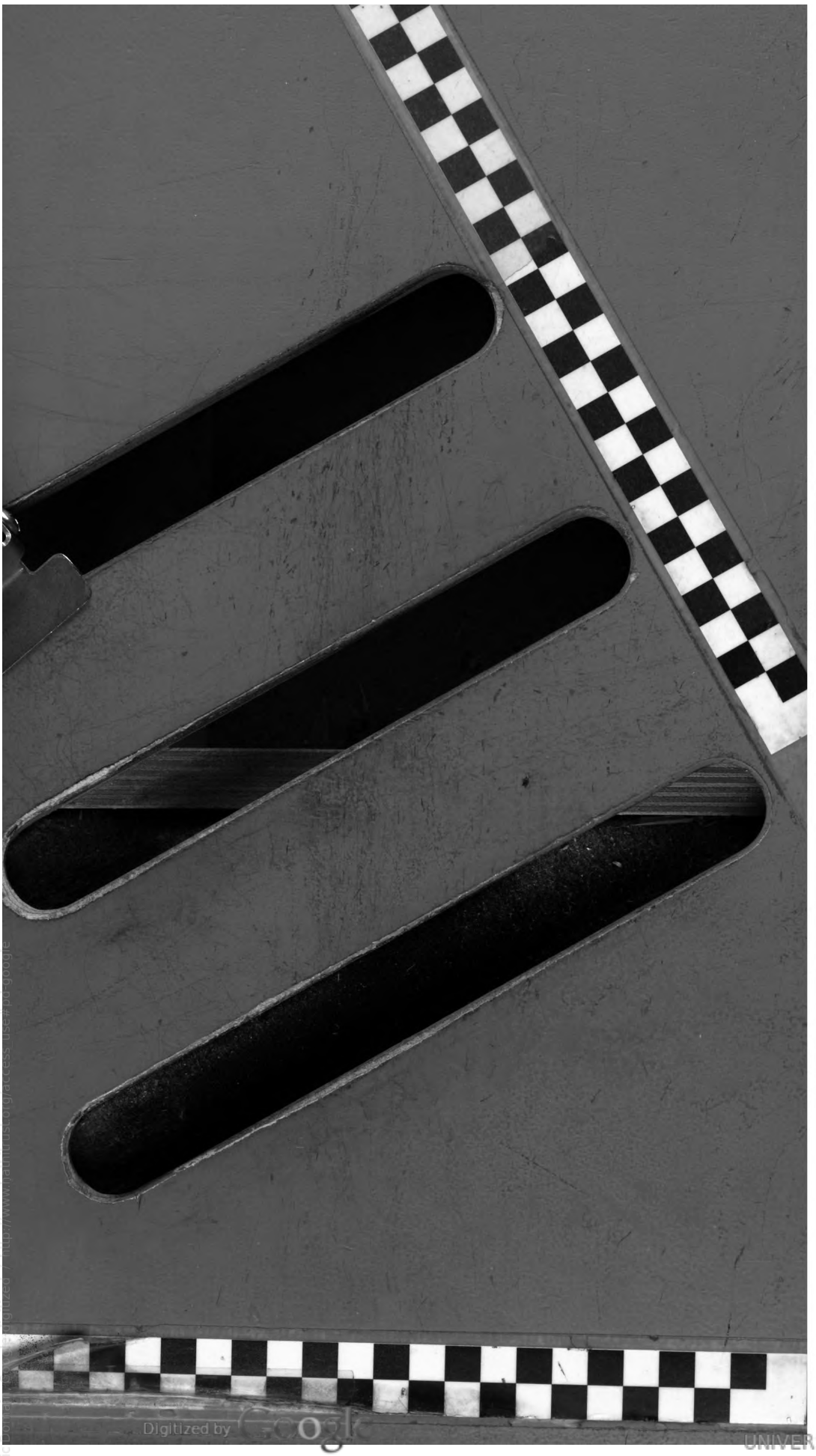

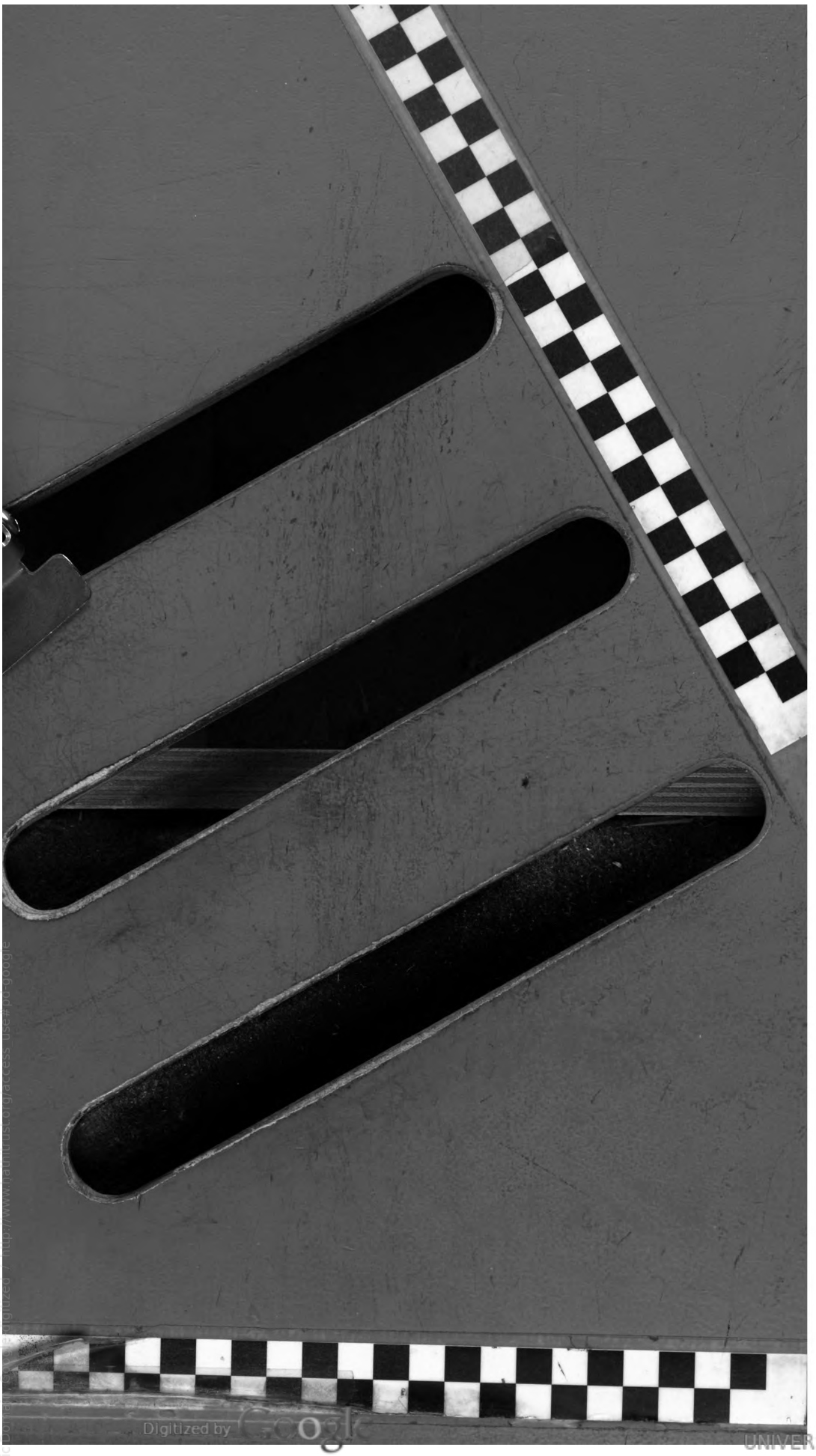

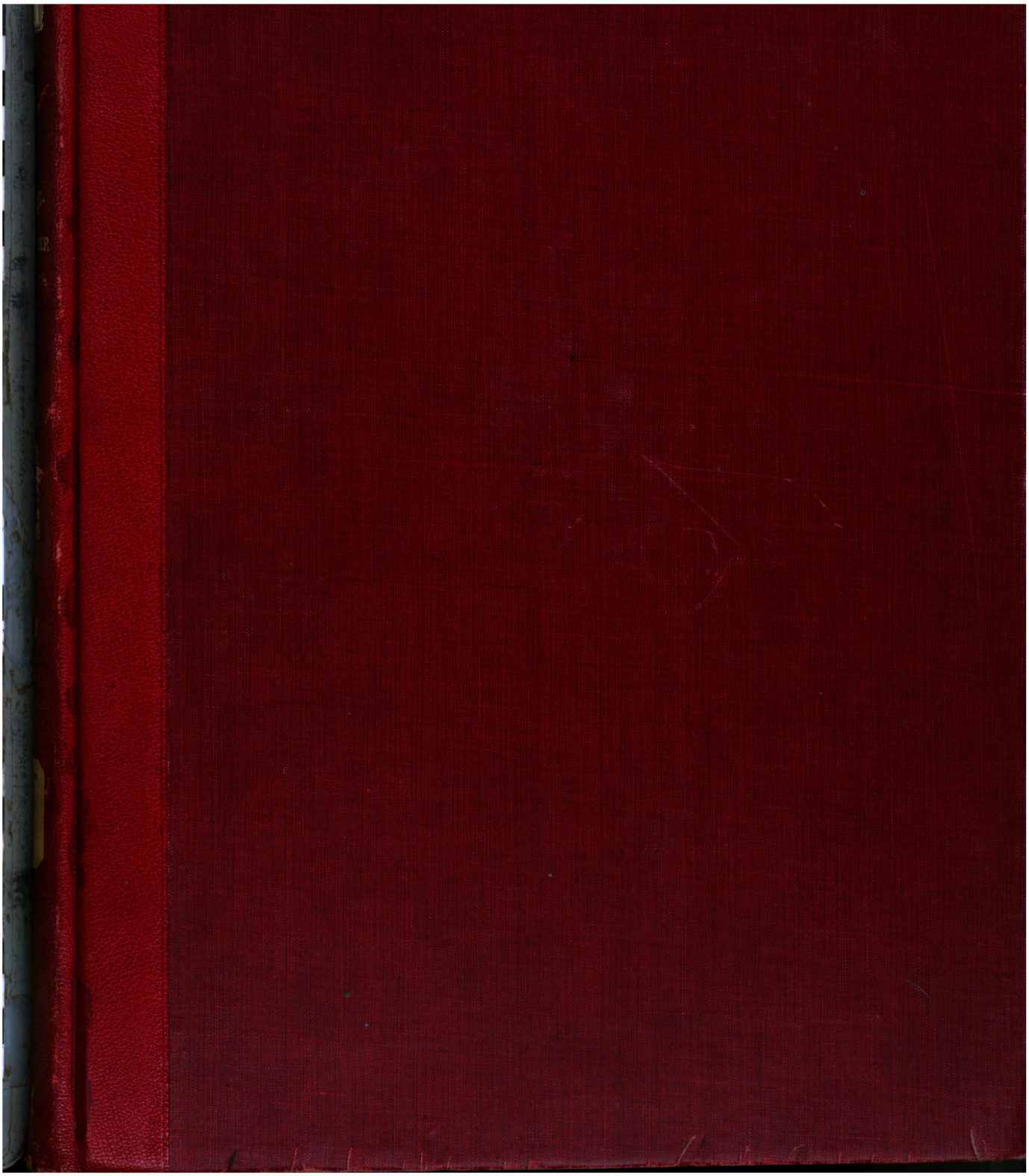

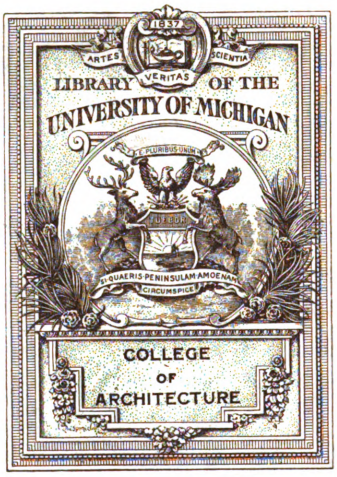

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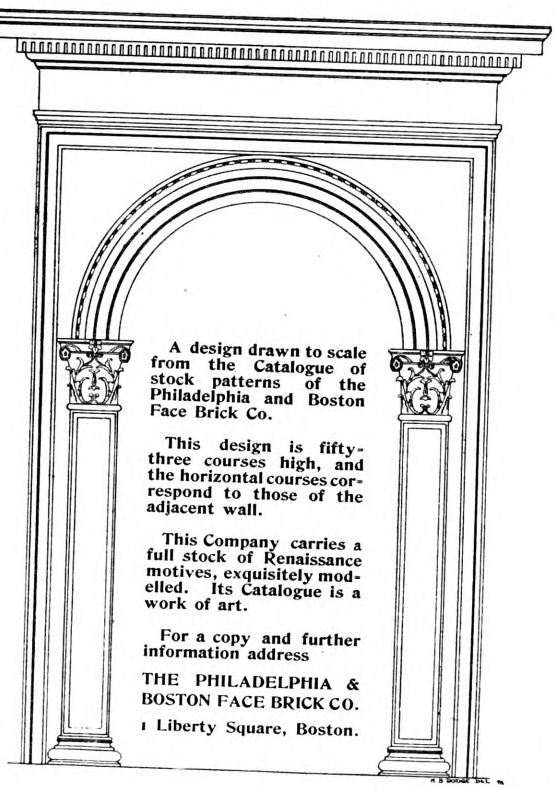

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Among the improvements in many directions which have characterized the architecture of this country during the last ten or fifteen years, perhaps none is more marked than the rapid advance that has been made in the use of brick and terra-cotta. Until recently, with us, brick was used as a rule merely because it was cheaper than stone, and generally with little or no attempt at decorative effect. In fact, the material seems to have been regarded as so hopeless a one in which to obtain architectural effect that hardly any regard was paid even to mass and proportion, or the relation of voids to solids, still less to detail. There were, indeed, a few notable exceptions, which served however only to emphasize the rule.

As the number of educated architects increased in the community, men who were more or less familiar with what had been and what was being accomplished in this and other respects in Europe, it was but natural that more attention should be given to the great possibilities of the hitherto despised material. The hints furnished by the clay architecture of England, the Netherlands, and especially of Italy, were eagerly made use of, and have led already to the production of a number of characteristic and admirable examples of brick architecture, which, while suggested by European precedents, have a distinct individuality of their own. The brick and terra-cotta manufacturers have not been slow in supplying the demand which the architects have created, and have furnished them with moulded brick and ornamental terra-cotta in the greatest variety, so much so that the very profusion has been a danger in the hands of the weaker designers. While the enterprise of our brick manufacturers has enabled our architects to accomplish what they have, it is not surprising, indeed it was to have been expected, that the rapidity with which the new field was entered upon should have produced much slipshod and slovenly detail, and much misuse of fairly good detail, as well as some really admirable work. Though much has been accomplished, much more remains to be done before a thoroughly satisfactory and characteristic brick architecture is produced, and the prospect in advance is endless.

One difficulty that has prevented the development of our brick architecture, thus far, from being as satisfactory as it might have been, is the want of contact between the architect and the brick manufacturer. One of the many advantages of brickwork is its economy; but if a special set of mouldings has to be made for each building, this advantage is largely and needlessly thrown away. Yet often the architect has been reduced to adopt this course or injure his building by poor detail, where good detail need not have been more expensive. On the other hand, the architect has not had full opportunity for familiarity with the different kinds of brick and their characteristics. There is need, therefore, of some medium to bring architect and brickmaker together. To provide such a medium is one of the aims which THE BRICKBUILDER proposes to itself. The architect, in using stone, comes directly in contact with the man who is to cut it; with the man who is to carve it; but with the brickmaker he is more or less at arm's length. If further advance is to be made in brick design, this gap must be bridged. A journal which shall be the recognized medium of exchange between the brick manufacturers and the architects seems to be the best means of supplying this want, and may become a potent factor in furthering the advance of brick architecture. It is to supply this want, and to attempt this task, that THE BRICKBUILDER comes forward, and it urgently and confidently claims the support of all who have the interest of this advance at heart. It is not trying to share in any way regions of technical journalism already occupied. It proposes to attempt to fill an unoccupied gap, and bespeaks the hearty support and co-operation of its fellow journals, both those which, on the one hand, occupying a wider field, cannot, in their larger view, give to the specialty the special attention which it requires; and, on the other, those which are devoted merely to the technical side of brick manufacturing, and which, therefore, do not reach the architects.

We have already pointed to the existence of faults and shortcomings in our brick architecture. One of the tasks which THE BRICKBUILDER proposes to itself is the criticism of current brick architecture, both in general and detail, with a view to aiding in the improvement, both of the designing of brick buildings and the details of brickmakers' catalogues.

Editorials and reviews by competent critics, who have made a special study of the subject, will point out what seems to be good and what seems to need correction in current work, bearing in mind especially the characteristics of the material and the kind of effects that are to be sought in its use, and pointing out the particular dangers to be avoided. Brick is recognized as the most durable of all building materials, but its great æsthetic possibilities are too often overlooked, and THE BRICKBUILDER believes brick architecture to be capable of a much higher development than it has yet received in any country. Whether or not such a development is yet possible with us, it does not stop to inquire, but it will do all in its power to further an advance that may tend in that direction. While proposing to give especial attention to brickwork, the new journal will not neglect terra-cotta, which is the natural material for the more elaborate decoration of brick buildings, but will give especial attention to consideration of its proper use and treatment.

As an aid toward future advance THE BRICKBUILDER will show what has been done in past ages with clay as a building material, by publishing measured drawings and sketches of old work; articles of a historical nature, and essays, letters, etc., from architects studying the subject abroad.

The modern work will be shown largely by working drawings from the architect's office, of buildings in course of construction, or of recent erection, and by photographs. In the reading matter, items of current interest; descriptions of special buildings; correspondence from leading cities; reports of new processes of manufacture, and new applications will cover what is being done at the present day with clay as a building material.

The future will be represented by ideal designs, the results of

competitions, and essays on the art of brick building, looking more to the possible than to the actual.

On the practical side THE BRICKBUILDER will have papers by specialists in the different departments of brickmaking, the protection of brickwork, effects of exposure, qualities of clays, characteristics of glazes, and other subjects of interest to the practical brickmaker. It will discuss the sizes of brick, both with regard to practical considerations and æsthetic value, and will use its influence toward the introduction of uniform standard brick sizes. It appeals to brickmakers throughout the country, as well as to architects, for a support which it is confident will be advantageous to all.

Departments will be regularly conducted, and the reader is referred to the detailed explanations which introduce these departments, in their proper places. Great care will be taken to make the plates all that can be desired, both in the selection of subjects and in their reproduction. There will be at least one hundred plates published during the year, with various supplements. Most of these plates will be measured or working drawings.

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Such is, in general, the journal it is proposed to issue. While it will be devoted to clay architecture, broadly speaking, it will give special attention to the use of bricks for architectural decoration, partly because this is the most common application of clay to building purposes, and partly because it seems that the greatest possibilities for future work lie in this direction. There have been true and logical "brick styles," and if architects will work on the same principles that governed their development, why should they not succeed in developing an equally vital American brick architecture?

The sixth annual convention of the National Brick Manufacturers' Association was an interesting and useful one. At all such conventions sociability is apt to seem to have the upper hand, but the solid results that flow from these meetings are more apparent in the long run than at any particular moment. But the meetings were earnest and the discussions full of practical suggestion. In its six years of life the association has more than justified its existence. It counts within its ranks the large majority of the progressive brick manufacturers, and there is every reason for it to look forward to a career of increasing usefulness. Among the discussions, that on the mixture of clays was, perhaps, the most interesting and fruitful, although Mr. Robert Lyle, of Woodbridge, N. J., who was to have read a paper on this subject, was unable to do so. The discussion suggested that the qualities and characteristics of different clays need careful scientific investigation.

In the course of this discussion Mr. Jas. Taylor, of New York, recognized the fact that "there are a great many architects who are beginning to drop these mechanical brick (pressed brick), and they are building buildings of first-class common brick, and they look better and more artistic." We venture to predict that the use of common brick will constantly increase, and for the reasons which Mr. Taylor gives.

The question of mixing clays of different kinds to produce different colors and different qualities in brick was interestingly treated by Mr. Fiske, of Boston (who stated that he was working twenty different colors in his factory), Mr. Eudaly, of Cincinnati, and others.

A suggestion was made by one member which, if not worthy of adoption, at any rate deserved more consideration than it apparently received. It was as follows: —

"I would like to make one suggestion in regard to making brick — that is, pressed brick. Pressed brick are all made one size at present, and when the bricklayer lays them he lays them all one way. The pressed and common brick are not bound together by laying the pressed brick crosswise as a binder, and the consequence is that all pressed brick fronts crack and shift away from the common brick; that has been my experience.

"My suggestion would be to make a pressed brick the same length as it is now, but just double the width or a little more, to make the exact width of a nine-inch wall. That kind of a brick would, in my opinion, strengthen the wall.

"Six or seven rows of brick could be laid, and the seventh or eighth row the double-width brick could be used as a binder. In that way, when the front of a house is finished it is well bound together, and the long side of the brick is only visible. I hope my suggestion will receive consideration, and that the double brick will be manufactured and put on the market."

The method suggested would undoubtedly greatly improve the pressed-brick front wall, as regards strength. It would not help its present uninteresting monotony as regards beauty. It would be better to make the pressed brick of such size that it would bond with the common brick.

The association did well when, in 1887, it adopted a standard size for common brick ($8\frac{1}{4} \times 4 \times 2\frac{1}{4}$); it would have done better if it had made the standard size for pressed brick the same, instead of a little larger ($8\frac{3}{8} \times 4\frac{1}{8} \times 2\frac{1}{4}$), so that they could without difficulty be bonded together. Possibly the idea in making the standard for pressed brick larger was that they might be laid with narrower vertical joints and used with the common brick. But in practice the variation makes the laying of a face wall bonded with the backing so troublesome that it is rarely, if ever, done, with the result spoken of by the suggester. A uniform standard size is best, and those pressed-brick companies who have adopted the common brick standard for their pressed brick are to be commended. It remains for other pressed-brick manufacturers to follow suit, and to make such agitation among the makers of common brick as shall make the present undersized brick a thing of the past.

Among recent brick buildings in Boston two stand out with especial prominence, on account not only of their inherent interest and importance, but from their juxtaposition on a prominent site. It is not often nowadays that two buildings of such unusual interest are built simultaneously side by side. We refer to the Youth's Companion building, on the corner of Columbus Avenue and Berkeley Street, and the Pope building next to it on the avenue. There is an excellent reproduction from a photograph of the latter building in the *Inland Architect* for this month (January), and we learn that elevation and details are to be published in the February number of *The Architectural Review*. In a future number of THE BRICKBUILDER it is hoped that the Youth's Companion building will be adequately illustrated. The two buildings are an interesting contrast, and while they mutually help each other, — which unfortunately can rarely be said of contiguous buildings in our streets, — they provoke comparison.

The smaller (the Pope building), by Messrs. Peabody & Stearns, is of light buff brick with trimmings of cream-colored terra-cotta. The doorway and what little stonework there is on the ground story is of light Ohio sandstone. Above this, all mouldings and decorative members are in the nearly white terra-cotta. The detail is refined and carefully studied and very rich. The ensemble is in most respects beautifully proportioned; but in the cornice the slight projection which the material called for seems to have been overlooked, with the result that the cornice is somewhat too light for the building. It should have been higher in order to have the requisite weight and dignity. Had it been a stone cornice, with the amount of projection which such a cornice would naturally have in stone,

its height would have probably been just right. The height of the upper story, on the other hand, seems somewhat too high in proportion to the rest of the building. Greater height added to the cornice and robbed from this story would have greatly improved the proportion of the whole. But the most regrettable thing about this building is that, architecturally, it is a mere façade. You turn the corner, and all the rich decorations, even the cornice and the strings, suddenly cease. There is nothing but a blank, uninteresting wall of yellow brick. We could gladly have dispensed with much of the rich decoration of the front (which, in view of the baldness of the sides, we are almost tempted to call overloaded) to have had the satisfaction which would have resulted from an architectural treatment of the whole. The façade is so detached from the blankness behind it, that it seems to lack support, and the fault, which unfortunately is the rule of most of our street architecture, is in this case made more apparent by the satisfying solidity of the neighboring building, whose conspicuous virtue it is to be treated as a whole. The cornices and strings run all around, even into the narrow alley that separates it from the Pope building, so that the great block tells to the eye as a massive and satisfying whole. Messrs. Hartwell & Richardson are to be congratulated in having given us in the Youth's Companion building, perhaps, all things considered, the most successful business block (from an architectural point of view) in the city of Boston. As the façade of the Pope building is a conspicuous and charming example of the use of terra-cotta with brick, so the Youth's Companion building is an unusually fine example of what is possible in brick architecture. Had the rich, mottled, russet brick been used throughout, instead of being supplanted by brownstone in so much of the lower story as is not glass, we think the building as a whole would have gained greatly. And in this case the brownstone strings in the upper stories, which are doubtless called for by the brownstone in the first story, would have been also of brick and would have received a treatment more in harmony with the rest of the building. At present their detail is somewhat heavy. The only other point we are inclined to criticise is the spotty and ineffective terra-cotta decoration in the spandrils of the third-story arches. It has not been well calculated for the height at which it is seen, nor the material in which it is executed. But the proportions of the building as a whole are so excellent, and the detail as a rule so good, that we should hesitate to point to those features which seem less successful, were we not convinced that careful and honest criticism is much needed just now as an aid to further advance in our architecture. We must not close this notice without pointing to the especially successful treatment of the cornice, which, by its great height, and boldly, yet architecturally treated, detail, secures, even with the slight projection which the material calls for, the massiveness required in the crowning member of so massive a structure.

A somewhat amusing example of the extent to which the "spoils" view of the civil service has extended itself to everything connected in any way with public administration, is furnished by the demand of the stone men that the mayor of Boston instruct the city architect to use more stone in his buildings and to stop using so much brick and terra-cotta. The idea that the stone dealers or any other dealers have any right to "a share" in city work regardless of public good would be ludicrous if it did not indicate to what a serious extent the pernicious "spoils" idea has eaten its way into the public mind. To any sane person, not personally interested, it should be obvious that the question of what is best for the public buildings is the only consideration that should be permissible. We may take occasion at another time to refer at length to the interesting manner in which the city architect of Boston is developing the use of brick and terra-cotta.

A FEW NEGLECTED CONSIDERATIONS WITH REGARD TO BRICK ARCHITECTURE.

It is a recognized canon of good design that the characteristic qualities, capabilities, and limitations of any material in which a design is to be carried out must shape and modify the design itself, and that the best results are generally obtained when these qualities, and often the very limitations, are made to suggest the ultimate form. Perhaps in the use of no material is this well-known rule more often nowadays disregarded than in the use of brick, although in the magnificent brick buildings of Lombardy and the Netherlands, which confessedly have inspired our work, the guiding power of this rule is constantly evident, though it was probably instinctively felt rather than consciously formulated. But all our modern design is necessarily more or less self-conscious, and the careful and reasoned investigation of the laws of design is, therefore, if we would do our best, a necessity, though doubtless often an irksome one. It is well to remember that our very self-consciousness makes the transgression of these laws the more repulsive in its results, since they never can have the charm of naïveté.

It cannot be denied that there have been great advances of late in the brick architecture of this country, and great additions have been made to the brick materials at the disposal of the architect, until there are now a great variety of bricks of unusual color (sometimes good and sometimes bad) and of widely different shapes and sizes. Probably never had the brick designer such a variety of material from which to choose.

But while this development has gone on, there has been but little corresponding advance in the use of the commoner materials; partly owing to a want of careful consideration on the part of designers of the various elements of brick design, the special and necessary characteristics of brick construction by means of which effects should be sought, and partly owing to obstacles which, by ill-considered and unsystematic methods of manufacture and vicious habits of craftsmanship, are unnecessarily and often unwittingly thrown in the way of the free and untrammelled use of the commoner materials. A want of due regard to the same laws has often prevented good results from being obtained by the use of the more unusual brick forms which have lately become so fashionable. Every one of discrimination can recall instances in which this disregard has produced worse results than could have been obtained (other things being equal) by a straightforward and simple use of the commoner materials. We do not now refer to the general laws which govern all good design, but to the particular laws which from the very nature of the case, and growing out of the peculiarities and special characteristics of the material, must obtain in all brick designs. A want of regard to these special laws has, we repeat, often marred or seriously injured otherwise good designs, and made the use of expensive forms or qualities of brick worse than useless. It is not maintained that these laws and limitations are never considered, but that instances are rare in modern design in which they all receive the close attention which they deserve and which alone will lead to the best results.

It may be worth while, then, to consider some of the characteristic qualities of brickwork, even though in so doing it will be necessary to make statements that will be but truisms.

A brick building is necessarily made up of small parts. This is perhaps constructionally the quality which most distinguishes a brick building from buildings of other material. In applying, then, to brick buildings the rule of design referred to at the beginning of this paper, it is obvious, that the small pieces of which the design is constructionally made up must be recognized in the design itself, if the best and most characteristic result is to be produced. Large members made up of small pieces should therefore be avoided; they only call attention unpleasantly to the necessary limitations of the material, and make what should be a source of excellence into a shortcoming. The design itself, then, should be made up of small units as the unit of construction itself is small, nor need this produce any unquietness of effect. Recognizing, however, that a sparkling and brilliant effect is most easily obtained by the use of these small units, this should be the effect aimed at, and the decoration therefore should be concentrated upon certain points of the design. This rule is apt to produce the best effects, no matter what the material, but it should especially be regarded when dealing with brick. In brick design, then, the wall surfaces should generally be kept broad and quiet, and decoration should be confined as a rule to cornices and strings, doors and windows, though even the windows are often best when least decorated

The small unit of construction has the most marked influence on the design of the cornices, which, owing to this fact, can have comparatively slight projection, and must therefore make up in height what they lack in projection to be equally effective. This is a point which is often overlooked in brick designs. Cornices are designed in elevation, as if the projection were to be that of stone. The exigencies of construction require them to be flattened, and the result is a meagre and inadequate crowning member to the building. Many of the palaces of Bologna afford striking examples of the great beauty of well-designed brick cornices, which crown their buildings quite as effectively as the more projecting but lower cornices proper to stone design. An observance of the same law will lead to the prevailing use of surface patterns, where enrichment is desired, instead of those of bold projection. These patterns have a beauty and effectiveness all their own, and their variety is endless.

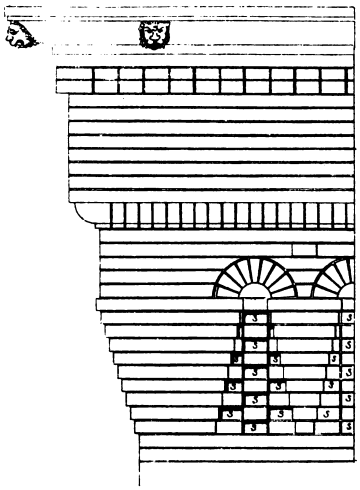
A similar consideration will suggest that the joints of brickwork should be emphasized rather than disguised. They should be regarded as an element of design to be used, not a defect to be covered up. Laying brick with very close joints is rarely, if ever, effective; it produces a stiff and mechanical, rather than an artistic and beautiful effect, and it deliberately throws away a feature that may be made of interest, while it cannot be wholly hidden; yet the common practice is to treat a joint as if it were something to be ashamed of. But the size of joints is a question that needs to be determined in each case by the exigencies of the particular design, and should be recognized as being as much a question of design as a question of construction.

Designers are apt to take the size of brick for granted. Indeed they cannot often help themselves, but are obliged to rest content with such sizes as the manufacturer places at their disposal. Yet the size and proportion of the brick must of necessity affect the design. In the first place it affects its scale. To convince ourselves of this, we have but to compare the differing scale of our brick buildings, built of brick that average about 8 x 4 x 2½ inches, with the English brick buildings with brick averaging when laid 9 x 4½ x 3 inches, or still more strikingly, with the so-called Pompeian brick recently in vogue 12 x 4 x 1½ inches. These last are often very effective, and it does not need to be pointed out how much their size and shape affect the appearance of the building. In choosing a brick it is rare, that enough consideration is given to the questions of size and proportions, and suitability to the design in hand. Often, indeed, this question is left to be determined after the drawings are made, when it ought to receive early consideration. The long, narrow brick with its closely drawn horizontal lines, will add to the horizontality of the building and therefore modify the proportion of the design as a whole. The use of bricks of different sizes in different parts of the same design can, if judiciously managed, be made to assist the proportions as well as to lend an added element of interest. But every such special use of brick needs to be attempted with care, and must be guided by the truest artistic feeling or it will result in disaster. Indeed every such opportunity for effect adds opportunity for mistake — is an added source of possible failure as well as of possible success. Brick manufacturers, as well as brick designers, need to pay more attention to the size of brick. As will be pointed out further on, the present almost entire absence of any standard brick size is a serious obstacle to the free use of combinations of different brick which could otherwise often be employed with excellent decorative effect.

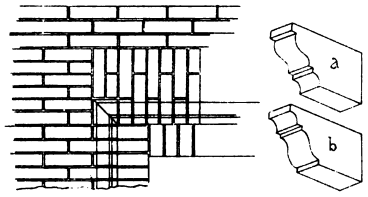
Another point which needs attention is the bond of the brick. The vicious practice, so common in this country, of using a face brick entirely different from the body of the wall, with either no bond or a necessarily slight, concealed one, is utterly to be condemned. In the first place, it is bad construction; the facing adds little or nothing to the strength of the wall, as is often very evident in conflagrations. In the second place, it fails to satisfy the trained eye; even if the bond were sufficient, the impression to the eye that there is no bond, that the wall has a thin facing in no way bound to it, is most disagreeable. In the third place, it does not make so pleasant-looking a wall as either the English, Flemish, or what might be called the American bond. It is too monotonous and mechanical and too lacking in character. Of the three bonds we have mentioned, the English and Flemish are as a rule much better constructionally than what we have called the American (we believe its use is confined to this country), *i. e.*, a bond consisting of a course of headers every four to eight courses. The latter is, however, a sufficiently good bond for all practical purposes, it may indeed be even constructionally better, where more longitudinal than transverse strength is required in the wall, and sometimes has a special value in design on account of the slightly marked horizontal lines produced by the continuous courses of headers, which, when the design seems to require it, can be emphasized by using headers of a slightly different color, either a brick of different clay or hard-burned brick. The English and Flemish bonds are, however, usually, much more effective, and make a much more picturesque wall, and each of them lends itself to its own peculiar class of diaper patterns of considerable variety, from the simple use of vitrified dark headers in Flemish bond, which is so effective in many of the "old colonial" buildings in and about Philadelphia, to the larger and more complicated patterns found in old English, Dutch, and French brick buildings; as, for instance, the diaper in English bond on the Louis XII. front of the château de Blois. The brick used in the diaper should not form too strong a contrast, or the result will be staring and unquiet. As a rule, the slightest contrast, that will tell, is the most pleasant, and it is often well to break the diaper irregularly to avoid too mechanical an effect, as is done in some of the buildings of the Inns of Court in London. Unfortunately, as already mentioned, the choice of colors in brick to be used together in this way is restricted to those which chance to bond together, and the designer is often obliged to content himself with what he can, rather than with what he would. It will be greatly to the advantage of brick manufacturers, as well as of architects, when a uniform standard size, or series of sizes, shall come into more general use. The contemptible sham of a false bond is sometimes resorted to on account, partly of this irregularity of brick sizes, and partly owing to the habit that has been formed by bricklayers using almost exclusively what we have called the American bond. So ingrain is this habit of the bricklayers that it costs more to use English or Flemish bond, though the additional cost is merely due to the fact that the bricklayers are unaccustomed to it. The more architects insist on the use of these bonds, the less expensive will they become. But at present so pernicious is the habit of our bricklayers that most of them will go to the trouble of cutting off the tails of their headers and make a sham bond, rather than lay their brick with a regular Flemish bond.

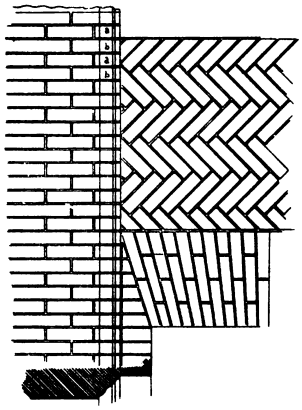
Probably the most striking visual quality of a common brick wall is its color. It is red: a very patent fact, which, however, is often not enough considered in relation to the design. In the deep red brickwork, mouldings of too slight projection, or too delicate contour lose their effect. If we desire our wall to be beautiful as well as red, we must remember that a perfectly even shade of very strong color over a large space is always especially unpleasant. Perfectly even shades are never found in nature, and are always to be avoided in art, but especially so with strong colors over large spaces. Now, an unvaried, stupid, tiresome red is not natural to a brick wall. It is natural to a brick wall to have the most delightful variety of color. The stupidity and tiresomeness can only be obtained by deliberately culling and arranging the brick until the effect is as mechanical and as ugly as if the side of the house had been painted, and it is worse than a painted wall, as the wearisome monotony has been painstakingly sought. It looks "neat" perhaps, but it is a trivial and detestable neatness, obtained at the expense of beauty. Brick should only be culled to throw out those of poor quality. It is strange that in nature we admire the wonderful variety of color in a shingle beach, and yet in building choose the dead monotony of a culled pressed-brick wall; that we go to Europe and admire the picturesque beauty of the many-tinted red-tile roofs, and yet in roofing our own buildings prefer to make them look as if they had been painted from a pot of vermilion. As a rule, common brick produce a more beautiful wall than pressed brick, on account of the greater variety of color and their superior texture. The pressed brick are generally best confined to the moulded work and arches, or used in bands in friezes or base course. In city buildings pressed brick can be appropriately used even for a whole building, if the brick are not culled to produce an even color, and they are especially valuable in interior work. But in buildings in the country, set among trees and rising from greensward, the common brick, on all artistic considerations, are greatly to be preferred, and the great variety of color that can be had by combinations of common brick of different makes (provided they will bond with one another) can be made productive of the most charming color harmonies.

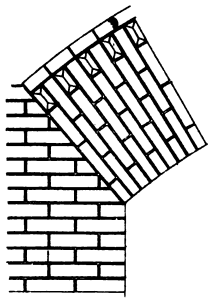
To speak of the use of tile and glazes, and of terra-cotta, which must play an important part in any complete brick architecture, is rather beyond the province of this paper. It may be worth while, however, to note that the use of tile of various shapes and colors in connection with brick can be made greatly to enrich our brick

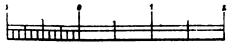


BRICKS MARKED "S" ARE SUNK



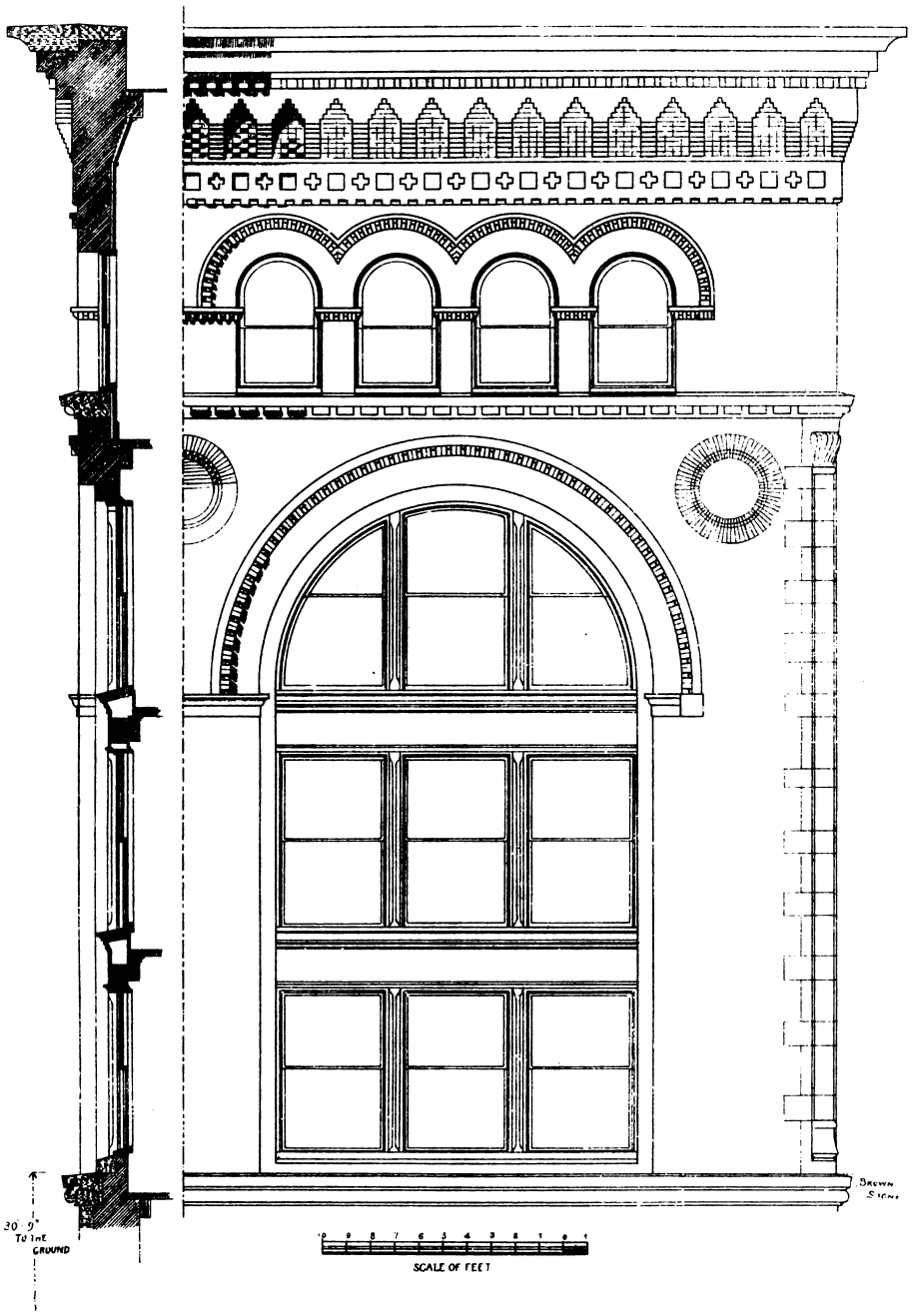






BUILDING FOR THE LUDLOW MFG. CO., BOSTON.

MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON.

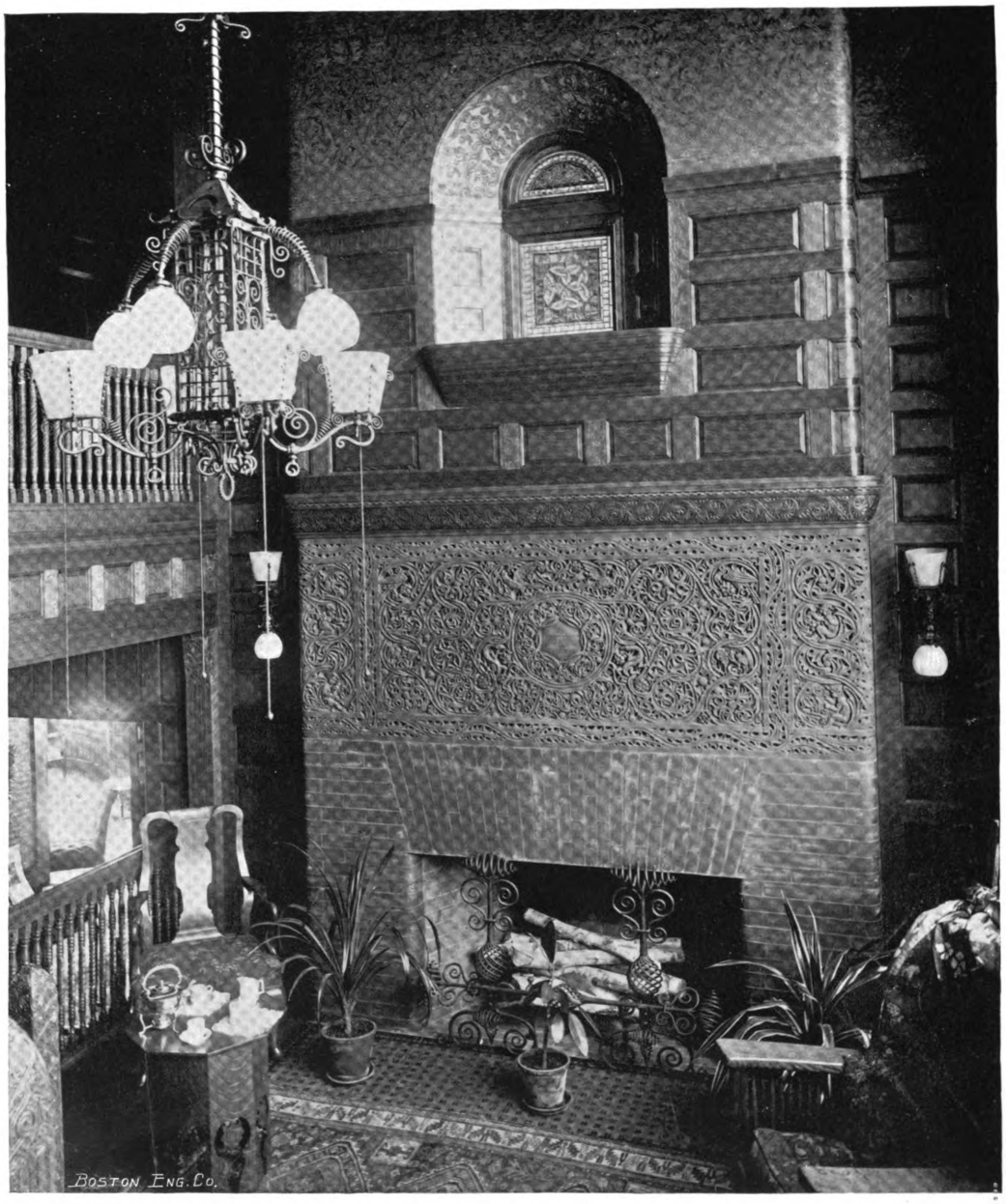


DRAWN FOR THE BRICKBUILDER FROM THE ARCHITECTS' THREE QUARTER SCALE ELEVATION

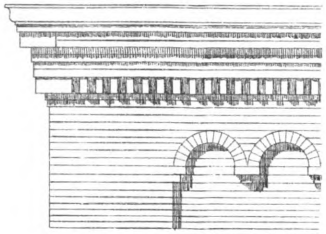
CORNER BAY OF THE LINCOLN STREET STORES, BOSTON.

FREDERICK L. AMES, ESQ., OWNER.

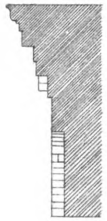
MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON.



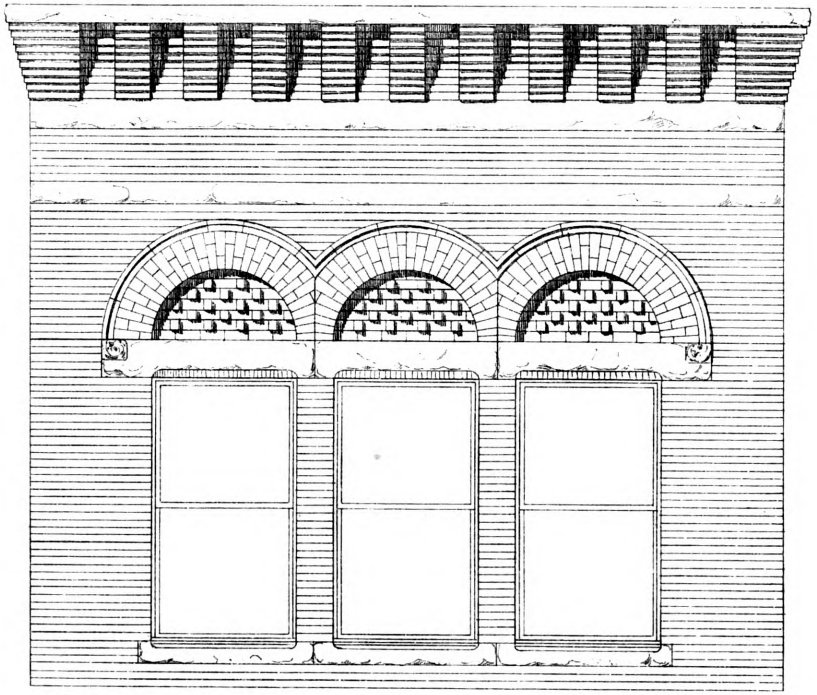
CARVED BRICK MANTEL IN RESIDENCE OF HENRY D. YERXA, ESQ., CAMBRIDGE, MASS.
Messrs. Hartwell & Richardson, Architects, 60 Devonshire St., Boston, Mass.

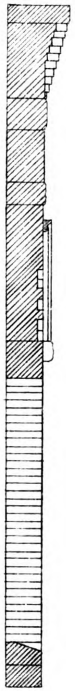


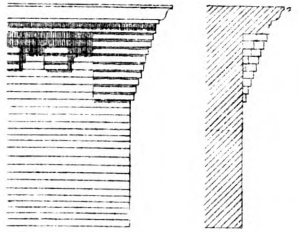
CORNICE · PHILIPS SCHOOL ·
· BOSTON ·



· SECTION ·
· PHILIPS SCHOOL ·
· CORNICE ·



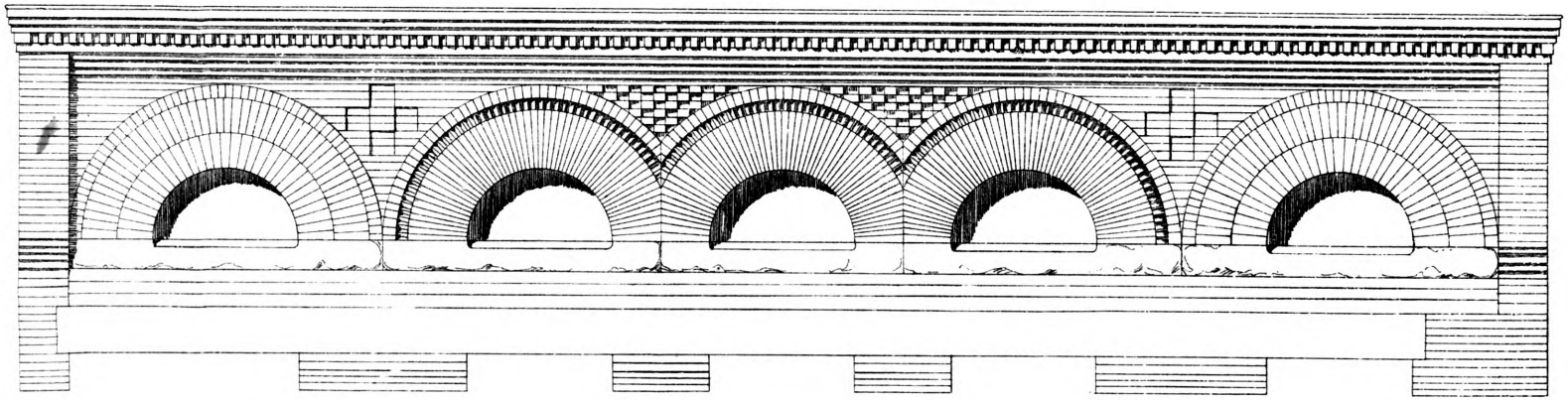


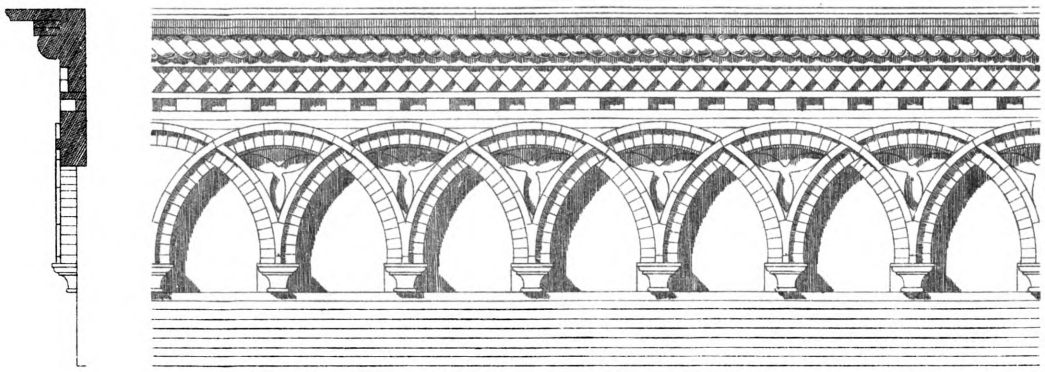


· TOWER CORNICE · ST ANDREWS HOUSE ·
· BOSTON ·

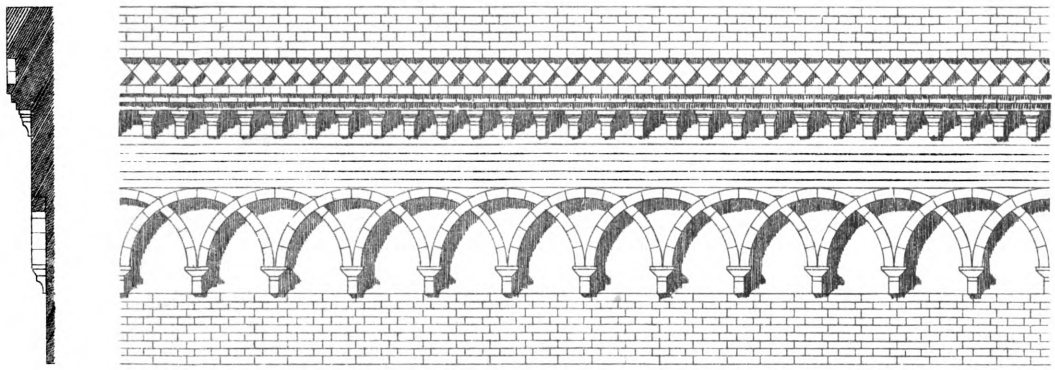
· THREE ARCHES AND CORNICE ·
· PATROL HOUSE · JOY ST ·
· BOSTON ·

· FIVE ARCHES AND CORNICE ·
· COLD STORAGE WAREHOUSE ··
· BOSTON ·

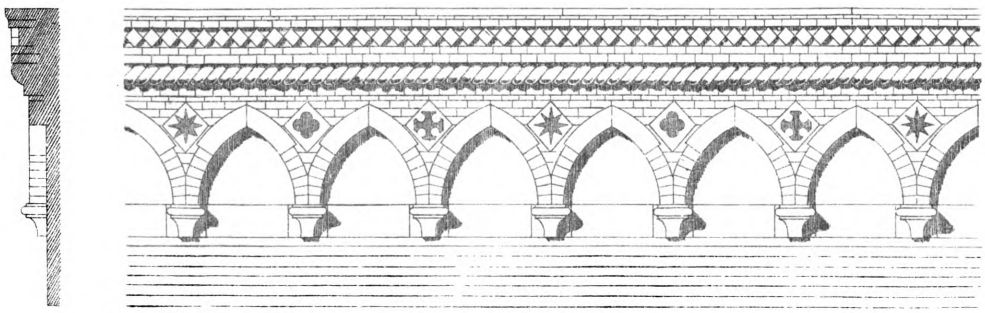




CORNICE
S. GIOVANNI E PAOLO
VENICE

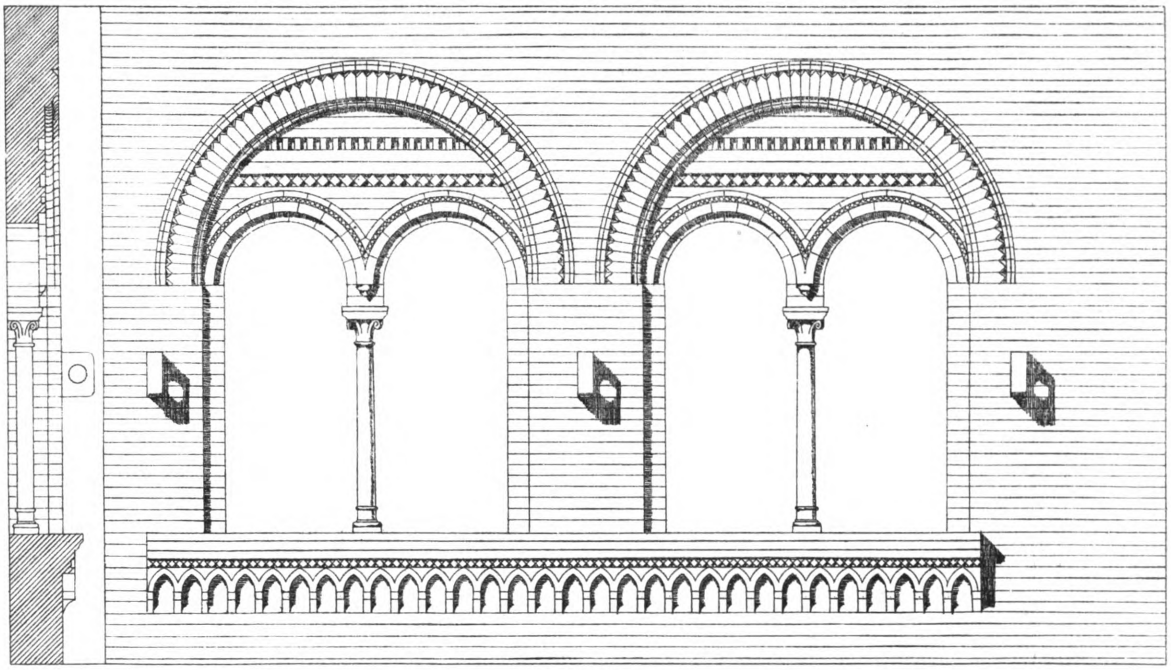


CORNICE
SANTA MARIA IN FORO
VICENZA

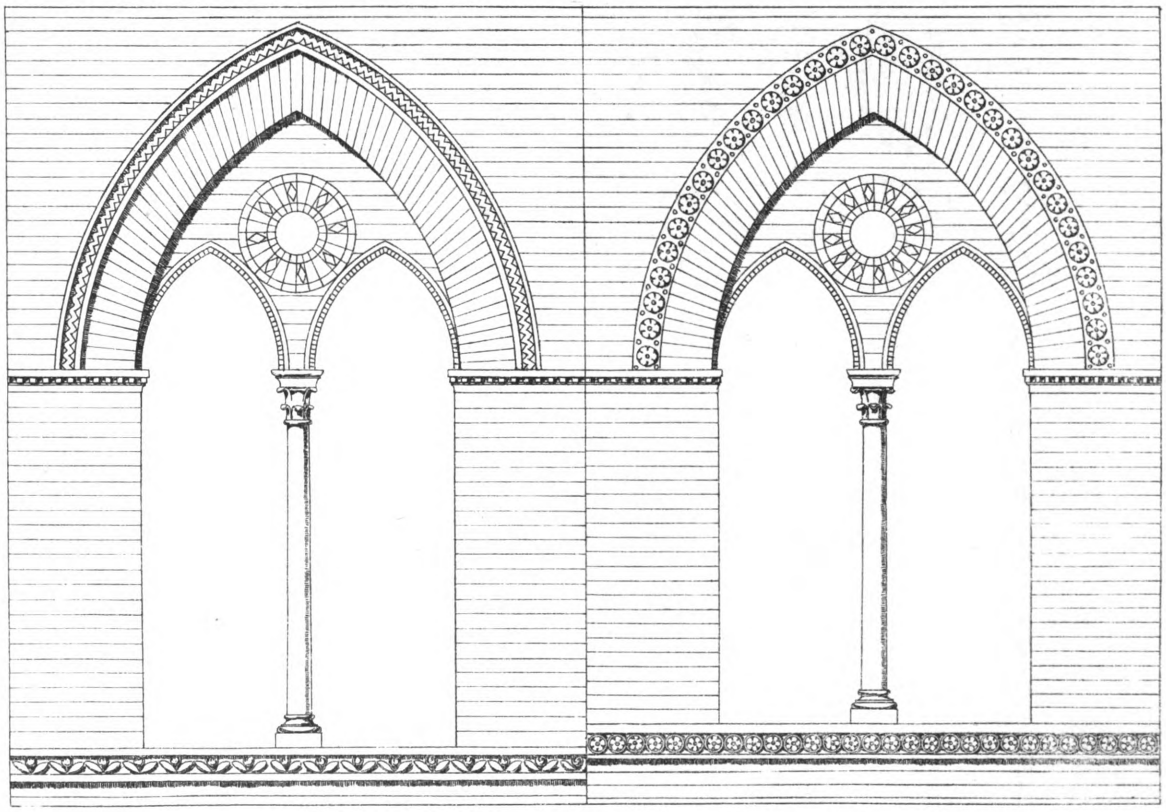


CORNICE
SANTA MARIA AI FRARI
VENICE

SOME ITALIAN CORNICES.



PADVA
CASA D'EZZELINO

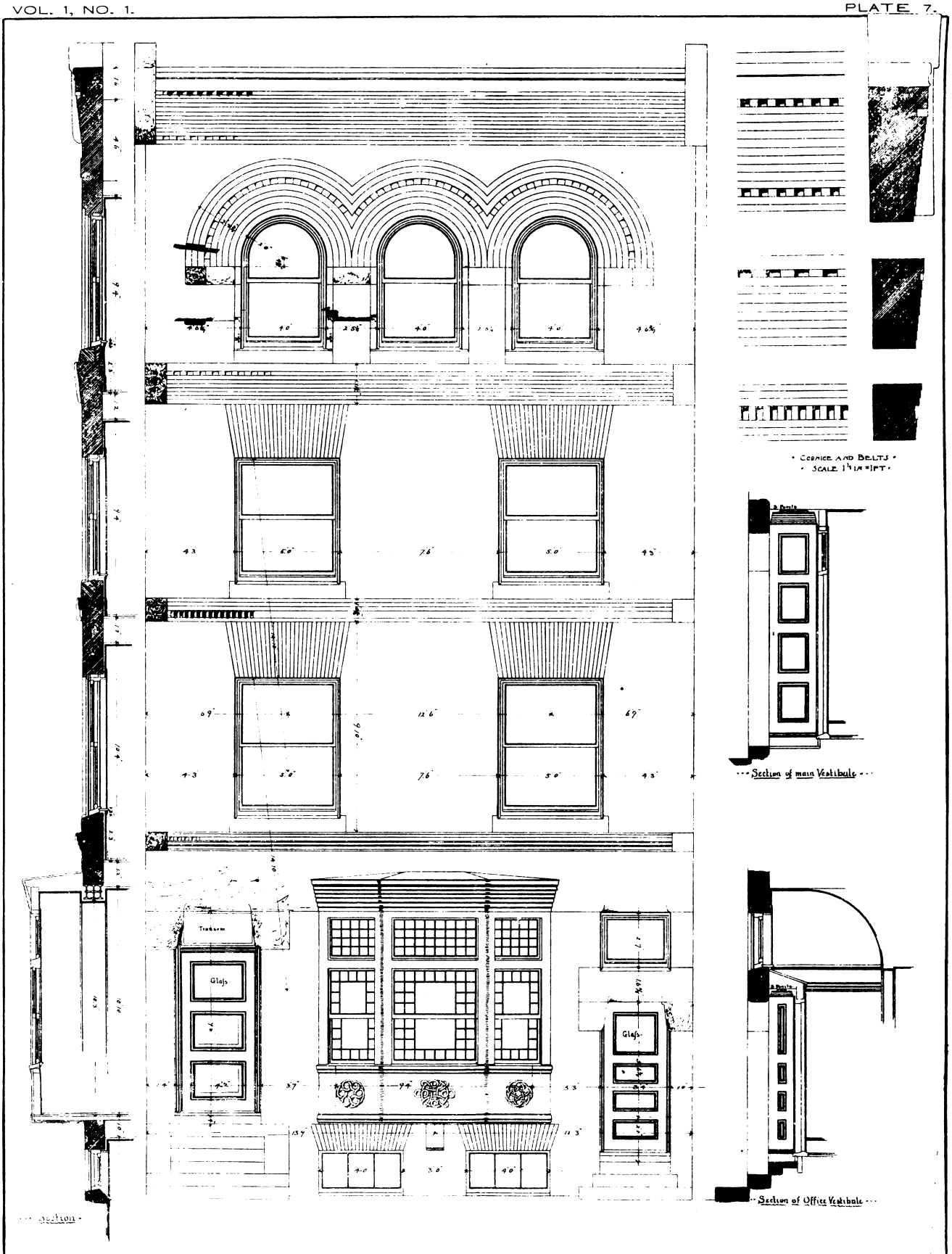


SAN GIMIGNANO
N° 10 PIAZZA CAVOUR

House for Dr. W. B. Parker: Marlboro St. Boston.

Messrs N. W. Hartwell and W. C. Richardson · Architects ·

PERSPECTIVE SKETCH, RESIDENCE OF DR. W. B. PARKER, BOSTON.
MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON.



ELEVATION OF RESIDENCE OF DR. W. B PARKER, BOSTON.

MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON.

GABLE OF RESIDENCE OF COL. J. C. HAY, WASHINGTON, D.C.

THE LATE H. H. RICHARDSON, ARCHITECT.

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architecture, and will doubtless in the near future lead to new and promising developments. One simple use of roofing tile very common in Auvergne may be mentioned for its effectiveness and its suggestion of further possibilities. The simple pan tile is there used to form the corbelling of the cornices of many of the dwellings. The tiles are imbedded in the wall at one end and project about one fourth of their length. They are laid close together, all with their concave side up. Three or four courses in height, breaking joint with each other, each course projecting beyond the course below, are used to form the corbelling of the cornices. The ends of the tile are filled with cement. The effect is extremely pretty.

It has been the object of this paper, merely to call attention to a few considerations with regard to brick architecture, which, though trite, are often neglected, in the belief that merely to direct attention to them will lead to their being more often regarded. In developing our own brick architecture we cannot do better than turn to the noble brick building of the past, in the endeavor to learn the principles that underlay its developments, and in the hope and belief that these principles will receive more beautiful exposition in the future.

H. Langford Warren.

A TERRA-COTTA STYLE.

The larger employment of terra-cotta as an architectural dressing promises to do something towards the development of a bolder style of street frontage than we have been in the habit of seeing. A few of the advantages of employing this material we have lately referred to in these pages, such as its durability compared with stone, and even with brick, in a smoke-charged atmosphere; but there is one other recommendation which it has over brick that may be mentioned, namely, its determination of feature. The architecture of every great period has been determined, in a very large degree, by the materials employed; thus we had the monolithic style of Egypt and Greece, in which large masses of stone or marble of great hardness were used in huge rectangular blocks, and we had the composite construction of the Romans giving expression to a more tractable and pliant style of building, in which bricks and smaller stone masonry were combined. The Romanesque and Gothic builders still further developed the composite method by adopting the arch and vault, and showed what noble and grand effects could be achieved by the use of small stones and rubble constructed upon a strictly mechanical system. Every component stone or brick was placed, or rather supported, by compressive action, enabling the builder, so long as he could use massive walls and buttresses, to build vaults unknown to the ancients. Architecture, like history, has repeated itself, and we are now in an age of transition adopting both methods. There is reason for believing, indeed, the monolithic principle is about to reassert once more a sway over the architect. The processes of manufacturing concretes out of broken material and *débris* has led to the production of large monoliths in construction, and burners of terra-cotta have discovered the secret of moulding masses of clay, without appreciable shrinkage or warping, that can take the place of stone. The re-employment of these materials, cast in large forms, will take us back to the trabeate system of the Greeks. But let us act upon principle, and not too hastily.

With brick, the architect had to combine to produce effect. Let us take the Gothic epoch of German brick-building, when the most elaborate structures were built of brick. In the earlier period the brick Romanesque prevailed in the North German lowlands, and a rich style of pier growth was the result, that has never been surpassed. The shafts of brick were grouped together or clustered, the upper part of the shafts being often brought to a square under the abaci, which retained the rectangular forms in plan. The towers, often connected, are well known to students of Rhenish architecture. In the later and Gothic epoch brick features reached their complete development; the piers were made less numerous, but became more elaborate in plan, for we occasionally see squares with membered shafts of half-cylindrical shape on each face, or octagon forms richly shafted and undercut between the salient angles; yet, with all these modifications, the simple outlines were observed, for it is a peculiarity of brick growth that though the parts are multiplied, the contours are preserved simple from the very exigencies of the material. In stone, in large masses, there was scope for the architectural enrichment by deep mouldings, and consequently we find the Gothic arch members often assumed very irregular forms in section. In brick architecture the contrary followed as a matter of course. We observe this in the deep splayed jambs and heads of doorways, where the receding face is broken up into squares or rectangular notches, or enlivened by shafts and members as in a rich moulding. A considerable richness of membering was thus produced, though, as one writer says, owing to the limits imposed by the material, a "strict architectonic law was observed in a certain rhythmic repetition of the design."

Now, what was the cause of the decline of this architecture? We find it was the general return to stone treatment. Hitherto the moulded work and ornamentation were restricted to the legitimate principle of brickwork or repetition of the same general form; but now architects began to copy stone design, the mouldings and tracery of stone, and from that time the brick architecture declined. We instance the history of German brick-building to show what has happened, and will happen again, if we mistake the employment of brick or terra-cotta for stone. Architects have been hitherto content to reproduce "literally" stone features such as windows, cornices, pilasters, and other ornaments in the material, without making allowances for the nature and properties of moulded and baked clay. As we find in the study of brick architecture, while it flourished both in Germany and Italy, the essential idea of brickwork was preserved, and a special treatment was followed depending upon the physical peculiarities of the material. It never imitated stone ornamentation; when it did, the style soon degenerated. We have few modern buildings in London where terra-cotta has been used with satisfactory artistic results. It is generally made a substitute for stone, and some architects design in so accommodating a manner that we constantly see in descriptions of designs sent in in competition, that the dressings or features may be executed in "either stone or terra-cotta." What can be expected from such an illogical process of going to work? If a façade has been designed for stonework, it is ten chances to one ill-adapted for a proper terra-cotta treatment. Large masses of the material cast in pilasters, mullions, jambs, and the like, and jointed with brickwork, are employed, which either crack by unequal settlement of the two materials, or by improper or close jointing of the terra-cotta, or are so warped in the lines as to destroy all sharpness of effect and accuracy in the work. In many recent city buildings in Fleet Street, the Strand, and the Poultry there are instances of misapplication arising chiefly from a desire to imitate stone features in the bulk. Thus we see whole windows with their ordinances cast in a few pieces of terra-cotta, arches constructed of blocks of large size, reproducing the details of stonework. By using smaller blocks — a certain multiple of the brick courses — and by preserving in the design a treatment dictated by the importance of avoiding inequalities of mass or undercut members, there is much to be done to render terra-cotta a pleasing and useful substitute of stone in brick buildings. The brickwork of Germany affords in many of its details very admirable forms, as those of jambs and piers, stringcourses, water-tables, cornices, and other features of a decorative character. No better models for moulded work can be seen than in many of the brick churches of that country. A larger and bolder manner of building or ornamentation must of necessity arise if architects follow the principle we have suggested. As the difficulties in the way of firing, etc., are overcome, so will the material be made into large blocks. The limits of the ornamentation are, however, set, and the forms which can be most easily moulded must stamp the architecture that is evolved from such material. For warehouse purposes, and street architecture generally, we have experience to work upon. In Farringdon Street, near Holborn Viaduct, a large warehouse for Marcus Ward & Co. is erected, in which a nice cream light red-toned terra-cotta has been introduced in the red brickwork, blending well with the latter. The style is a free Renaissance, a large, wide, and somewhat awkwardly proportioned gable occupying a considerable portion of the front, with one low wing. The centre of the gable has a bay window entirely of the material, and the large two and three light windows with mullions and ornamental heads indicate the value of terra-cotta for window openings of a large flat kind. A deep cornice, with flat modelled trusses of slight projection and relief ornament between, runs along the front, and from this the raking cornice and coping, also of terra-cotta, springs. Here the projections are kept flat. We could point to other recent examples of the use of the material; in the mean time the value of relief of a light kind, for red brickwork especially, and a tint that will harmonize with the red work and keep clean, are obvious advantages, not to be slightly passed over. — *The Building News.*

SPECIAL DESIGNS FOR THE BRICKBUILDER.

A MODEL CHURCH.

THE BRICKBUILDER has commissioned a prominent architect of Boston to prepare a careful and complete set of plans, elevations, and details of a church to be built entirely of brick. It is intended that this design shall be ideal in that it is the solution of a general rather than a special problem. It will, therefore, contain many features, some of which would be omitted under certain conditions of actual execution, some under other conditions, but any one of them left out of the solution of the general problem would leave that solution incomplete. Therefore, that it may embody all requirements, even of a ritual service, it will be an Anglican or a Catholic church, but all details of construction and of decorative brickwork will be studied upon so broad a basis that they will apply equally well, so far as principles are concerned, to any other church edifice. The designer chosen for this problem has made a careful and exhaustive study of brick architecture in the different countries of Europe, and especially in the Netherlands where the natural building material is clay, where a true "brick style" is found, and whence comes the inspiration of much of the best American work.

The drawings for this church, giving plans, elevations, sections, and details, exterior and interior, will be published in an early number of the paper, and will be accompanied by a complete explanation.

The church is the first of a series of problems which will be given to architects of the highest ability, and we hope to get general types of different classes of buildings, which shall serve as models for study by those who do not understand the fundamental principles of brick design. This series must not be confused with the competitive designs announced below, for they are entirely different. Both classes, however, are instituted in an effort to find out what can be done — they form that portion of the plate matter that is devoted to the future.

THE BRICKBUILDER COMPETITIONS.

To encourage original design in ornamental brickwork, THE BRICKBUILDER will institute a series of carefully arranged competitions, with rewards adequate to the problems. These competitions will be open to every one upon the single condition that the programme be carefully followed. Besides the several principal prizes, which will be either money or books, or both, there will be a number of minor prizes given to all competitors whose work reaches a certain standard of excellence. Each competition will be thoroughly fair and impartial, the awards being made by a competent jury. It is only owing to lack of time to complete arrangements for the satisfactory judgment and criticism of designs, that the announcement of the first competition is deferred until our next issue.

To afford some idea of what these competitions will be, we will mention a few of the problems that will probably be submitted for solution. As one idea is to lead architects and draughtsmen to a careful study of the finer points of detail work, some problems will present a certain number of definite features with which it will be required to harmoniously combine others. For instance, a window will be given with certain fixed mouldings and ornamental features to which it is necessary to add others to complete the design. The designer is here limited to a careful study of decorative design, in which the best proportion of parts, the best distribution of decorative units, is going to win.

Again, a façade will be given, lacking one feature, say the cornice. The various patterns of bricks at command will be given and the designer will be required to complete the façade by the addition of the cornice, which must be in proportion to the rest of the building and of the same character.

To suggest improvements in the design of ornamental bricks, some problems will be given in which it will be necessary to devise patterns which will meet certain general requirements, artistic and constructive, among the latter of which will be economy of manufacture, perfect bonding, adaptability to interior and exterior angles, returns, etc.

Occasionally larger problems with proportionate rewards will be given, and these will call for designs of complete buildings, the programme being drawn up with a view to representing a *type* of problem, the solution of which will lead to general rather than to specia study. The winning designs will be published in THE BRICKBUILDER, and if there are others of real merit, arrangements for their publication may subsequently be made.

The programme of the first competition, with full conditions, will be announced in the February number.

WETTING BRICKS BEFORE USE.

New bricks are always covered with a coating of dust and fine sand, and, unless this coating is washed of, it intervenes between the bricks and mortar, and frequently entirely destroys the adhesion. Strong brickwork cannot, therefore, be executed either in lime or cement mortar unless the bricks are not only damp but have actually been washed. Colonel Totten, of the United States army, remarks on the subject of experiments against casement embrasures: "In the later firings against brickwork from a 42-pounder, it was noticed that there was a separation of bricks from mortar very generally, as the limit to the breach caused by the shot; and it was certain that if the cohesion had been greater the effect of the shot would have been materially less." "The want of cohesion was due, as seemed to me, beyond any doubt, to the interposition of dust, sometimes quite free, but, perhaps, more generally composing a layer slightly cohering to the body of the bricks. The process of laying must be to cause every brick to be thoroughly soaked in water, and to be laid the moment it ceases to drip." In an experiment made at Shoeburyness with shot and shell fired from an 80-pounder Armstrong gun against an experimental brick revetment before the Defence Commission, not only were the bricks blown out without a particle of mortar adhering to them, and generally without a fracture on them, but about three feet from the ground, the whole of the under part of the revetment was blown away for a length of twelve or thirteen feet, and to a depth of five or six feet, leaving an entire horizontal course of bricks at the upper limit of the fracture, with an even course of cement adhering to it, precisely as if it had been laid on as stucco after the lower part of the wall had been removed. To have allowed of such a clean separation, leaving a horizontal beam of bricks with so long a bearing standing, and evenly coated with mortar underneath, some unusual interference with the adhesion of the mortar must have been at work. As the wall was built on a site of which the soil consisted of fine sand, it seems probable that the line of separation marked the termination of one period of the work, and that before the next was commenced a layer of fine sand had been deposited on it by the wind. Colonel Totten thinks that his orders with respect to wetting the bricks could be carried out, without extra expense, by an "arrangement easily devised," but Vicat states "the soaking of materials is evidently an addition to the labor which should be taken into account in the detailed estimates," and doubtless, though the extra expense of water when abundant need be trifling only, there must be some allowance made for it beyond what is now paid for brickwork. It is certainly, however, well worth consideration whether, if the difficulties in the way of carrying it out were greater, they ought not to be surmounted, more especially in extensive fortifications constructed with bricks burned on the spot, and built into the work as soon as they have left the clamp or the kiln, — often, indeed, before they are cold. What difficulties there may be in effecting it are not so much raised by the master builder — for a trifling extra price to cover the expense of the wetting would satisfy him — as by the bricklayer, whose day's labor is considered of the same value, whether he works with wetted or dry bricks, and bricks "just ceasing to drip" are so hurtful to his fingers that he has a decided objection to handling them in that condition. Colonel Totten, indeed, in continuation of his former remarks, adds, "but I must caution you that, as this will be in some respects a disagreeable process to the masons, they will neglect it or do it improperly, unless it

be imperatively and perseveringly insisted on." The best plan, therefore, would be to wet the bricks for them by trustworthy workmen, employed and paid by Government. Probably a soldier, who has been accustomed to obey orders to the letter, could best be depended upon in such a case. Vicat recommends in large works watering the bricks whilst in the stack with a fire engine, so that they may reach the mason's hands in a soaked state. It was thus, he states, that M. Inspector-General Deschamps, at the bridge of Bordeaux, watered the bricks piled upon the service bridges. — H. D. Y. Scott, in *The Architect*.

THE ILLUSTRATIONS.

Plate I. Building for the Ludlow Mfg. Co., Boston. Messrs. Peabody & Stearns Architects, 53 Exchange Street, Boston.

The basement story and the sills and strings of this building are of brownstone; the rest is entirely of brick. It is a capital example of the beauty that can be attained by a simple and right use of ordinary brick forms. It is noticeable that the effect is obtained, with only a sparing use of moulded brick. The few moulded brick used are from the Philadelphia and Boston Face Brick Co.

The building is charmingly proportioned, and the detail well studied and good in scale. The cornice is a good example of design suited to the material. It has great height and shallow projections.

Plate 2. Corner Bay of the Lincoln Street Stores, Boston, Fred. L. Ames, Esq., Owner. Shepley, Rutan & Coolidge, Architects, Ames Building, Boston.

Our illustration shows the upper part of one bay of this store. The story below is of brownstone, as are also the strings and the crowning member of the cornice, and the angle column. The building is an admirable and well-proportioned example of the effective use of common, unmoulded brick. The only moulded brick is in the dentils. The cornice is especially successful, and is an example of the peculiar attractiveness that can be given to a well-treated brick cornice having qualities such as could not be obtained in any other material. We venture, however, to question whether the use of brownstone for the lower story, in connection with brick above, is ever desirable. Each material seems to lose by juxtaposition with the other, and we think this building would have gained in dignity and attractiveness had it been entirely of brick. The brick used in this building are sand-struck bricks from the kilns of the Granite State Brick Company, at Epping, N. H.

Plate 3. Some Boston Details.

These are characteristic, but by no means faultless details, quite representative of the average of modern brick architecture.

The upper part of the cornice of the Phillips school is liney and confused, and has rather too much projection for the treatment adopted. It would be improved by suppressing some of the offsets. The cornice of the Patrol House on Joy Street is rather bald in effect, and the very long brackets seem hardly required to carry the slight, but rude and shapeless, crowning member of stone. The arches are an example of the way not to combine stone and brick. The combination of arch and lintel is unpleasant in itself, and one feels that either the arch or the lintel is superfluous. The five arches of the Cold Storage Warehouse are better; but here, too, the cornice is unpleasantly liney. It would be improved by suppressing one of the offsets. The diaper formed of alternately projecting and recessed headers is effective. Where such projection is used to form diapers or other decoration in brickwork, it will be found that a very slight projection generally produces the best result.

Plate 4. Some Italian Cornices.

The cornices here given are from the churches of San Giovanni e Paolo and Santa Maria Gloriosa dei Frari a Venice, and Santa Maria in Foro at Vicenza, all of about the middle of the thirteenth century, and are characteristic and admirable examples of Italian Gothic brickwork. The great height and very slight projection of these cornices are especially noteworthy, as well as the simple means by which so much and so beautiful effect is produced.

Plate 5. Some Italian Windows.

These examples of Italian Gothic windows from the house of Ezzelino at Padua, and from a house in the Piazza Cavour at San Gimignano, are of about the same period as the examples of cornices given. Here again the flat projections, the surface decoration, and the smallness of the parts are to be noticed, and the curious method of alignment of the arch brick, the joints of which are struck from one centre as for a semicircular arch.

Plates 6 and 7. Residence of Dr. W. B. Parker, Marlborough Street, Boston. Messrs. Hartwell & Richardson, Architects, 60 Devonshire Street, Boston.

This is another example of effect obtained by the simplest means. There is here absolutely no moulded brick. The detail of strings, cornices, and arches consists entirely of slight offsets in the brick courses, and the use of simple dentils of projecting headers used flatwise or vertically. The design seems to us rather too heavy in effect for a private house, due especially to the exaggerated depth of the flat arches and archivolts, though this heaviness is partly redeemed by the very slight projection of all the members, and the stories are too nearly equal in height for the best proportion. In this respect we cannot help thinking that the design would have been greatly improved by the omission of the string at the level of the third-story window sills. The design is at any rate to be commended for its straightforward simplicity. The brick used in this building are Hoyt's water-struck bricks, made at Haverhill. The first story is of brownstone.

Plate 8. Gable of Residence of Col. J. C. Hay, Washington, D. C. The late H. H. Richardson, Architect. Published by permission of Messrs. Shepley, Rutan & Coolidge, Boston.

This gable is a suggestive instance of the use of flush brick patterns. The rounding of the window jambs and inner edges of the arches is the only moulding in the gable, and this does not tell as a moulding, but merely a softening of the edge. The patterns are all flush, the label course over the windows being the only projecting brick. The pear-shaped centres of the scallop ornament are flat tiles made to shape and set flush. This decoration was doubtless suggested by the scale-like arrangement of the arches which form the inner shell in Roman brick dome construction, as at the Pantheon, or as may be seen in the exposed brick domes at Spalato. This Roman domical work was not intended to be exposed, but is very decorative in effect, and suggestive. The tipped brick in the gables are found in old Dutch work in New York State, especially about Albany.

Supplement. Fireplace in the Residence of Henry D. Yerxa, Cambridge, Mass. Messrs. Hartwell & Richardson, Architects, 60 Devonshire Street, Boston.

We think the cases are exceptional in which terra-cotta is not on all accounts to be preferred to brick carving, as the latter method of working is not germane to the material. But the treatment of the brick carving in this mantel seems to us one of those exceptions. The effects sought are such as can better be given by means of carving in brick than by the use of terra-cotta. The intricate, interlaced ornament makes use of the limitations of the method very cleverly, and the sparkling effect, the evenly distributed pattern, and the deep incisions of the darks are all more suited to carving in brick than to terra-cotta, and justify the use of the method employed. The design points very clearly to the distinction to be made between brick carving and terra-cotta. It was executed by Mr. John Evans, of Boston, and the bricks are the Philadelphia Peerless.

INTERCOMMUNICATION.

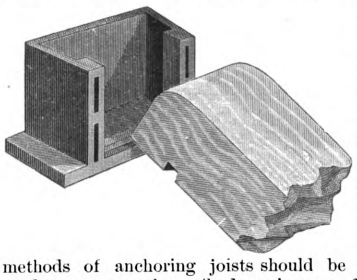
One of the aims which The Brickbuilder proposes to itself is to bring architects and brick manufacturers, as well as brick masons, into closer relationship, and as one means to this end it will open its columns to questions and answers, suggestions and criticisms on all matters related in any way to the subject matter of the journal, whether practical or æsthetic. This department will be left entirely in the hands of our readers, and its value will depend on the interest they take in it. We have no doubt, however, that such an interest will be taken in it as will insure its great usefulness. We commend the department to architects, brick manufacturers, and brick masons, and urge them to make the freest use of our columns by sending any questions, suggestions, or points of interest which occur to them in the course of their daily practice and work, and as you, reader, whoever you may be, hope to profit by others' answers, we conjure you to reply to any question that may appear here, the answer to which your special knowledge enables you to give.

PRACTICAL NOTES.

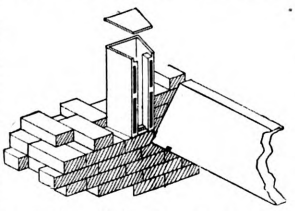
[**PUBLISHERS' ANNOUNCEMENT.** — Under this heading we shall mention improvements in connection with brick-building, but *in no case* will any paid for matter be allowed in these columns, for the purpose of this department is not advertising. No matter appearing here is in any way, shape, or manner published as part of any advertising contract, verbal or written. The selection is made for the practical use of our subscribers. While in many cases articles are written upon data supplied by manufacturers, we are confident that these data are trustworthy.]

WALL ANCHORS.

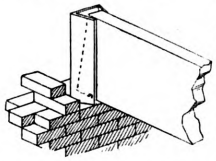
For many years the usual method of anchoring walls consisted of an iron strap with a T head welded upon the end. This strap was securely nailed to the joist, while the T end was built into the wall. This method, while being good enough and very simple, had one very bad fault, namely this: in case of fire the joists quickly burn through, and in falling they cannot free themselves from their anchorage, and the consequence is that in many instances the walls are either broken or else pulled down. No one will deny that a standing brick is the best barrier to the spread of fire, therefore such methods of anchoring joists should be adopted as will have no tendency to tear the walls down in case of accident or fire.



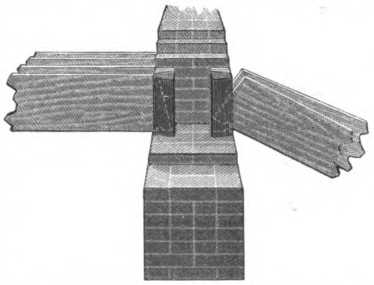
The Goetz Box Anchor is a new form for anchoring joists to a wall, consisting of a cast-iron box in which the joists at intervals of six feet apart are fastened to the wall. A lug in the bottom of box and a notch in the joist form the tie from wall to wall. It can be easily seen that any deflection of the joist will simply separate the tie, allowing the joist to fall while the box remains in the wall.



Government tests have been made in which the notch placed three and one half inches from the end was found to equal five wrought nails in strength, such as are usually used to fasten the old-style strap. Some importance is attached to the necessity of properly building the box into the wall, and as this part of the work belongs to the mason, he should understand what the object to be accomplished is, and then he will better understand what he must do. The boxes are usually placed in position on the joist by the carpenter, and the mason in walling up around it should see that a line of headers comes within the height of the boxes. He should also arrange his brick in such a manner that it will be impossible to remove the box from the wall. It is not necessary to cut any bricks, but it is important that the joints next to the box be well filled with mortar or cement.



It is usually a difficult matter to properly anchor an old wall that is to be used as a parti-wall. In many cases no attempt is made to anchor such a wall. With this method it is comparatively easy to do. In cutting the niches into the wall, both sides of the hole should be cut on the same angle as is found on the box anchors. The hole should be made large enough to admit the box. After placing in position, the extra space at the side of the box should be filled with cement. In this way an anchorage is formed with the wall that cannot be displaced or torn out.



These box anchors are made in many forms to suit the size of timbers, and for heavy girders the base plate is extended outwardly, forming a good bearing on the wall. Air spaces are also provided which permit a circulation of air around the timber and thereby prevent dry rot. If the timber is wet or unseasoned it has a chance to dry out after being put in. These also afford protection against fire from defective flues, as the joist ends are covered by a ventilated iron box.

The company introducing this invention have agencies established in nearly every large city, who will estimate and furnish the castings delivered at the building. The castings are so simple that any foundry can make them. We understand that over one hundred buildings are now supplied with this new device, which is the best proof of its utility.

BOOK NOTICES.

A TREATISE ON MASONRY CONSTRUCTION, by Ira O. Baker, C. E., Professor of Civil Engineering in the University of Illinois. Sixth edition. New York, John Wiley & Sons.

The sixth edition of Prof. Baker's standard treatise hardly needs more than to be mentioned. The parts of this useful book with which THE BRICKBUILDER is directly concerned, while short, contain much valuable matter. The chapter on brick treats of the processes of manufacture, the classification of brick with the qualities and properties of each class, the requisites for good brick, methods of testing, absorbing power, strength, and sizes of brick. Chapter VIII., on Brick Masonry, treats of the relation of mortar to the strength of brickwork, of the various bonds, of compressive and transverse strength, of measurement of brickwork, of estimates and specifications, of the comparative value of brick and stone masonry, of efflorescence in brickwork, and methods of making brick impervious to water. In relation to the bond of brick it is worth noting that what we call English bond, like "English breakfast tea," is peculiar to this country. In England, the English bond is always a course of headers and a course of stretchers in alternate courses, yet the specifications of the Atchison, Topeka & Santa Fé Railroad as here quoted speak of "the ordinary English bond, five stretcher courses to one header course." What the author says of the comparative merits of brick and stone we venture to quote in full: —

"Brick masonry is not much used, except in the walls of buildings, in lining tunnels, and in constructing sewers, the general opinion being that brickwork is in every way inferior to stone masonry. This belief may have been well founded when brick was made wholly by hand, by inexpert operatives, and imperfectly burned in the old-time kilns, the product being then generally poor; but things have changed, and since the manufacture of brick has become a business conducted on a large scale by enterprising men, with the aid of a variety of machines and improved kilns, the product is more regular in size and quality, and stronger than formerly. Brick is rapidly displacing stone for the largest and best buildings in the cities, particularly in Chicago and St. Petersburg, where the vicissitudes of the climate try masonry very severely. There are many engineering structures in which brick could be profitably employed instead of stone, as, for example, the walls of box-culverts, cattle-guards, etc., and the less important bridge piers and abutments, particularly of highway bridges.

"Brickwork is superior to stone masonry in several respects, as follows: 1. In many localities brick is cheaper than stone, since the former can be made near by, while the latter must be shipped. 2. As brick can be laid by less skilful masons than stone, it costs less to lay it. 3. Brick is more easily handled than stone, and can be laid without any hoisting apparatus. 4. Brick requires less fitting at corners and openings. ✱5. Brick masonry is less liable to great weakness through inaccurate dressing or bedding. 6. Brickwork resists fire better than limestone, granite, or marble; sandstone being the only variety of stone that can compare with brick in this respect. 7. Good brick stands the effect of weathering and of the acids in the atmosphere better than sandstones, and in durability even approaches some of the harder stones (see §§ 31–33). 8. All masonry fails when the mortar in its joints disintegrates or becomes dislodged, therefore brick masonry will endure the vicissitudes of weather as well as stone masonry, or even better, since the former usually has thinner joints."

We doubt if the belief "that brickwork is in every way inferior to stone masonry" was ever "well founded." Witness, for instance, the numerous brick buildings of ancient Rome and mediæval Europe. In engineering works brick is much more used in Europe than with us, especially in England, and with us, as Prof. Baker admits, brick might often with advantage be used in place of iron. In the paragraph on efflorescence we find no mention of some of the more recent methods proposed for making brick walls impervious to water, such as Caffall's and Cabot's processes. Some comparisons of these with Sylvester's method, which is described, would have been of value.

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PUBLISHERS' NOTICE.

The many details connected with starting THE BRICKBUILDER, the necessity of making special drawings, of having articles carefully prepared, took considerably more time than was anticipated when the work was begun last year and the first number set for January. But believing that a good start is half the battle, the publishers have adopted the policy of not saving time at the expense of quality, and while material for future numbers is well in hand, so that the lost time will be made up, this gain will be gradual, and will not be increased at the expense of quality. This explains the tardy issue of this number; but we trust the care taken in selection of material will pardon its appearance a month late. The number for March is well in hand.

Our lateness of publication — caused by unexpected delays at the start, and which we shall gradually make up — enables us to refer to the appreciative notice of this journal which we are glad to receive from the *Clay Worker* in the March number. The *Clay Worker* so justly defines the position of THE BRICKBUILDER, as compared with its own, that we venture to quote the notice entire.

"There is a new missionary in the field, another advocate of better buildings, THE BRICKBUILDER, an illustrated, monthly magazine, devoted to the advancement of brick architecture. We shall be happy, indeed, if any work of ours may contribute to the material success of this able advocate of a worthy cause. This journal, carefully edited, copiously and artistically illustrated, will do a great deal for good building. It always requires some boldness and a certain amount of risk to enter a special field, which presents no records of previous successes to justify an effort. THE BRICKBUILDER deals with brick after they have been marketed. The *Clay Worker* deals with brick in the process of manufacture and marketing. As an advocate, we suggest uses for brick and clay products for the purpose of enlarging the field. THE BRICKBUILDER takes up the work where we leave it, and deals with brick and clay products in an artistic and constructive spirit. With its well-selected examples, its beautiful illustrations and trite (?) suggestions, we can see that the building world will be made better by the existence of this publication. And we shall hope that brickmakers, as well as brick users, will see and appreciate the work that is being done for them in the higher education of the people, and do their share in the support and encouragement of this journal. It is certainly not out of place for us to say here that the work of special journalism in all lines is doing an incalculable amount of good in the rapid advancement of all of the world's interests. We welcome the new missionary, which is published by The Brickbuilder Publishing Company, P. O. box 3282, Boston, Mass."

We thank the *Clay Worker* for its good wishes, which we heartily reciprocate so far as a recruit may without presumption reciprocate the good wishes of a veteran. We think that when the brickmakers, the builders, and the architects discover what THE BRICKBUILDER is and what it is doing (and we intend they shall not lack opportunity), they will very soon conclude that they cannot do without our journal; indeed the indications already begin to look that way.

The same number of the *Clay Worker* contains a reproduction from a photograph of a grain elevator at Hamburg, Germany, built entirely of brick, which, among problems of its kind, is of unusual interest and excellence from an architectural point of view, and shows how much can be done to give charm to the most utilitarian building when its design is treated with thoughtfulness, reserve, and artistic feeling.

As the *Clay Worker* rightly says, in an excellent and very just critique on the design of the building, "There is no problem in building, where building work is done substantially, that does not admit of artistic treatment independent of cost." The whole article is well worth reading. There is also a short article by Mr. J. W. Crary, Jr., on hollow walls, in which he dwells on their desirability and real economy.

In the March number of the *Architectural Review* we notice the excellent design for the headquarters of the Boston Fire Department by Mr. E. M. Wheelwright, the city architect of Boston. The building is simple in design, excellent in proportion, and very effective, with its lofty tower modelled after that of the Palazzo Vecchio at Florence. It is a characteristically brick building, although with some stone trimmings. Much of Mr. Wheelwright's work since he entered upon the duties of city architect of Boston is of unusual interest. We shall certainly be within the mark when we say that the buildings to which we refer must be regarded as among the most interesting examples of brick architecture which this country has produced. We publish in this number a detail of the Agassiz Grammar School, and shall in future numbers publish other examples of the more noteworthy of these brick and brick and terra-cotta buildings which are now in process of erection for the city of Boston. Mr. Wheelwright has evidently studied with great care the brick architecture of Europe, especially the Lombard brickwork of the 14th century, but has made free and original, and for the most part very successful, use of his models. The use of colored mortar as an element of color design is in some of these buildings carried further than we have known it to be elsewhere. For instance in the Agassiz Grammar School, the first story is laid in red mortar, the second in yellow mortar, and the broad frieze at the top in broad joints of white brick and clay products in an artistic and constructive spirit. With its well-selected examples, its beautiful illustrations and trite (?) suggestions, we can see that the building world will be made better by the existence of this publication. And we shall hope that brickmakers, as well as brick users, will see and appreciate the work that is being done for them in the higher education of the people, and do their share in the support and encouragement of this journal. It is certainly not out of place for us to say here that the work of special journalism in all lines is doing an incalculable amount of good in the rapid advancement of

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A more legitimate method of producing color effect is in the use of brick of different colors, and we do not remember to have seen this more charmingly done than in some of Mr. Wheelwright's designs for cornices.

Mr. Wheelwright also makes free use of different bonds as a decorative element. We find in these buildings not only the ordinary Flemish and true English bonds but an original and very decorative use of what Mr. Warren in his article in our last issue referred to as the American bond. The course of headers used every seventh course is recessed half an inch from the wall face, thus emphasizing the horizontal lines which these courses naturally produce. Besides this we find a very curious bond, we believe of French origin, which consists of a course of stretchers alternating with course consisting of three headers, a stretcher, a header, a stretcher — then repeating. It could be used to form a most interesting series of diapers in different colors, a use we believe Mr. Wheelwright has not made of it.

Builders, and still more, owners of buildings are very apt to think that "a brick is a brick." Especially where it is a question of purchasing common brick, the quality of the brick is not sufficiently considered. As a matter of fact, it is in purchasing common brick that especial care needs to be exercised, as there is every grade from the large, soft, poorly formed and underburned brick, which is common in some parts of the South and West, to the hard, compact, well-made waterstruck brick, which in durability is probably for all practical purposes equal to the ordinary run of pressed brick. The want of care which intending builders exercise in the selection of their brick retards the improvement of common brick manufacture. By a false and short-sighted economy builders stand in the way of their own best interests as well as those of the community. So careless are buyers sometimes that undersized brick of poor quality can be frequently sold for the same price per thousand as a larger brick, although it will take more of them to do the same amount of work.

The improvement of the quality of common brick is a matter that is of especial concern to our smaller Western cities and towns, particularly those of more recent growth. Improvement in the quality of the brick is likely to go hand in hand with improvement of brick architecture. Better design will demand better brick, and better brick will demand better design; and better architecture means advance all along the line for any town. In most growing Western towns what is desired is a quick return and a large return on the money invested; but in the long run a better quality of work will pay better. Indeed, a little more exercise of care and forethought will produce vastly better results at very slightly increased expenditure. Those builders who in the future of these towns will go ahead of their fellows will be those who have the wisdom to look to the future, who have the foresight and the knowledge to take advantage of any suggestion or any means of improvement which may present itself, who have not only energy and push but public spirit and intelligence, and the desire to do good work. We believe that conscientious work pays in the long run, not only in self-respect, but in dollars and cents.

In many towns of the West and the new South — we are perhaps not wrong in saying in most such towns — the brick are of such poor quality that it is thought necessary to paint the fronts of brick buildings. If they are to keep a respectable appearance they have to be repainted every few years. A little more care with the brick, and this expense of painting would be avoided and a much more attractive building produced. In Tennessee, for instance, the ordinary brick if soft-burned are red; but if hard-burned they are an unsightly gray. These brick are poor in quality as well as in appearance because not compact. By the use of a repressing machine these brick, which are over large, can be reduced in size, made very compact, and when burned produce, at an expense of about $6 per thousand, an excellent and very pretty mottled brick, somewhat similar in appearance to those which in Eastern markets sell for about $45 per thousand. These brick could be sold at a good profit at $8 per thousand if once a demand for them were created; and we believe it would only require one pretty building of this brick in any growing district to create the demand. A hand repressing machine can be had for about $100.

We only give this as one instance of what may be done by a little intelligent enterprise. One reason which leads to the painting of buildings is the streaky appearance produced by the great variation in color of the brick; but the different culls could be mixed so as to produce an even and pleasing variety of color or, with a little pains and trouble, the different colors could be arranged in bands and patterns to produce charming decorative effects. We hope in a later issue to have an article on the various patterns and diapers that can be produced by the use of different bonds.

A point that needs more attention than it often receives is the proper protection of the top of brick walls. The durability of a brick building is largely effected by the protection or want of protection of the top of the wall. A board with a tin coping is the least protection any brick wall ought to have even in comparatively unimportant positions. But a terra-cotta, especially a salt-glazed terra-cotta, coping is better; or the roof itself may be made to project well out from the walls, supported by projecting rafters or brackets. This not only affords the protection the wall needs, but the broad shadows produced are most effective, as may be seen in many of the old Italian buildings.

There can be no doubt that both in this country and in Europe architects are gradually awakening to the possibilities, in our day so little attempted, of color decoration on the exterior of buildings, or rather, they are beginning to dare to make the attempt which hitherto, probably from timidity, they have avoided. This new development, or rather this revival, finds its echo in the technical journals. We print in this issue an excellent article by Mr. C. H. Blackall on the use of colored terra-cottas, while the *Architectural Review* for Feb. 1 has an admirable editorial on the possible return of color to the exterior of buildings. One thing that has hitherto deterred from the use of much color in the exterior of buildings, has been the fact that the severity of our climate prevented much use of applied color, and until the recent development among us of the production of glazes and of colored terra-cottas and bricks, there was, in this country, almost no available means of permanent color decoration on the exterior. This recent development of color possibilities brings with it danger as well as promise, and it would be well carefully to consider the laws, so subtle and so inexorable, of color design. It may be said at once that except in the hands of an artist, of a man with the color sense inborn, failure is the certain result. Yet some consideration of the right use of color is useful. The remarks in the editorial in the *Architectural Review* to which we have referred are so excellent that we venture to quote from them at length. "In using the opportunities afforded us by the colored enamels of faience, of tiles, etc., it is worth while considering how far we shall adopt them, and in what manner. That they are of excellent colors is conceded, and the temptation to mass these colors is natural enough, but it seems to us that in massing them we should adopt some one color as the field, and display upon that, at points or in places determined by the constructive expression, enrichments of other colors which would form focus points of mosaic. In mosaic much is due to the texture given by the frank avowal of the joints. In the use of enamelled brick or tile this is frequently neglected. The public has an especial fear of a light mortar joint, because it is associated in their minds with cheap, badly laid walls. They also dislike a broad joint for the same reason. Yet an avowed joint in any compound structure, such as brick or tile, must be of great value in constructive expression, in preventing too sleek, smooth an appearance of wall, in fact, in giving

texture and softening of color. In the coloring of the Alhambra reliefs all the reveals are left white. In the glazed tile wall surfaces of the African mosque towers the joints are large and left white, and the designs thus enhanced. This is suggestive, therefore, in the method of using enamelled faiences."

In that excellent journal, the *Semaine des Constructeurs* of the 16th of January last, there is also an article on the use of faience in the external decoration of buildings which is very suggestive. In Paris this method of decoration seems to have been quite frequently applied to store fronts, especially in trade signs, in which elaborate decorative and pictorial designs executed in faience on the face of the building indicate the trade pursued within; so in one case two symbolical female figures representing the art of glass-working and the art of the worker in clay, and in another in a corner panel in a house a blue vase on a white ground, surrounded by a border of Persian or Byzantine design. We do not feel inclined to recommend to our storekeepers this elaborate and expensive use of color in trade signs. The store front is, for the most part, in best taste and most attractive when kept perfectly simple, and our street signs are wont to be too blatantly conspicuous as it is. But this use of faience does suggest a new field for color decoration in the architecture of buildings where elaborate decoration is appropriate.

In our last issue we noticed a suggestion made at the meeting of the National Brick Manufacturers' Association, that it would be well to make a pressed brick of double the ordinary width to be used as a bonding brick, and the hope was expressed that this brick would be manufactured and put on the market. We gladly call attention to the letter from the Hydraulic-Press Brick Companies of St. Louis, Chicago, Washington, etc., stating that they manufacture just such a brick. We hope that this will come into general use as a bonding brick where the even appearance of a wall all stretchers is desired. As a rule, however, we repeat that a visible bond is to be preferred as a matter of artistic effect.

ST. LOUIS, March 10, 1892.

The Brickbuilder, 4 Liberty Square, Boston, Mass.

DEAR SIRS, — We have received the first copy of your paper, and note the extract from the remarks of a member of the National Brick Manufacturers' Association at Washington. The same remarks were published in the *Clay Worker*, and we replied by sending them a copy of our catalogue, and calling their attention to a brick made for the purpose suggested by this member. This is a brick which we have made for a number of years, and it is quite popular.

Yours truly,

H. W. ELIOT,
Hydraulic-Press Brick Co.

For those readers who did not see the January number we wish to again call attention to the brick church which Mr. J. A. Van Straaten, Jr., of this city, is designing for us. Mr. Van Straaten studied under a celebrated architect in Holland, the country of all countries for brick buildings, and his work was largely on churches. Here he acquired a thorough knowledge of all forms of brick construction, and we believe we have made no mistake in commissioning him to design for THE BRICKBUILDER a church that will be ideal, in that it is the solution of an ideal problem, with no restrictions that will prevent the design from becoming a model for the study of church building in brick. A most complete set of drawings will be published.

In our next number, for March, we shall begin the publication of a carefully selected series of photographic supplements of the best examples of European brickwork, with comments and description which we are sure will be of value to all classes of our readers.

The *Inland Architect* of February publishes among other things an excellent design by Mr. Francis M. Whitehouse, of Chicago, — the residence of Mrs. Barbara Armour of that city. The house is of light-colored stone and red brick, and is noticeable for the decorative frame, formed apparently of alternately projecting and receding headers, which surrounds and unites the windows of the second and third stories with excellent effect.

It is a somewhat unusual and very successful use of a simple and well-known brick treatment. The beauty of the brick wall, as well as the strength of construction, would have been increased by the use of a visible bond in the brickwork. The wearisome monotony of a wall face consisting of nothing but stretchers is made the more noticeable by the otherwise charming design.

The *Inland Architect* for March has a very suggestive and interesting design for the Girls' Mutual Benefit Club at Chicago by Jenney, Mundie & Waid, architects. The building is apparently on a twenty feet wide city lot, is such as to be suited to a private house, and is three stories high. It is curious in that the entrance is below grade. The design is one that shows the success that may be attained by a simple and appropriate use of common brick even without any moulded work. The cornice especially is interesting and effective.

We desire to call special attention to the announcement of competitions as promised in our last number, which will be found in another column. We earnestly hope that a large number of draughtsmen will be found willing to enter the lists. The problems presented are practical ones and should prove interesting to designers, and the judges whose services we have been fortunate enough to secure will insure an impartial and just decision on the real merits of the designs submitted.

GREEK TERRA-COTTAS.

The majority of Greek terra-cottas are small figures in the round, varying in height from four inches to twelve inches. Occasionally they exceed these dimensions. These figures exhibit a variety of male and female types, some of which may be at once recognized as mythical personages, while to the majority no name can be assigned; many are probably mere studies from real life. They were generally cast in moulds, and afterwards retouched by the hand. Occasionally specimens occur which appear to have been modelled. Originally these figures were all painted in tempera, and some few still preserve their original colors. Many of these terra-cottas were doubtless votive offerings, and must be considered as separate figures; others formed part of larger compositions. In some cases these figures were attached to the surface of vases, when they were called emblamata. Compositions in relief are rarely met with. Such terra-cottas are found in every part of the Hellenic world, but especially in the tombs of Magna Græcia, which have yielded an immense variety of small figures. They have also been obtained by excavations in ancient cities and especially within the precincts of temples. These figures are not to be regarded as elaborate works of art. They are modelled with great freedom and sometimes a little carelessly; but in the attitudes and the composition of drapery, they show a felicity and boldness of invention which are well worthy of the attention of the modern artist. Many of them seem like sketches in clay, taken from life, or studies and recollection of the works of great sculptors. When we consider that they were in most cases the cheap and common product of the mere modeller (horoplatos), we see how generally a knowledge of art must have been diffused among the Hellenic people. The British Museum contains a very fine collection of figures of this class, chiefly from Rhodes, Athens, the Cyrenaica, and Magna Græcia. — *The Architect.*

ON THE USE OF COLORED TERRA-COTTA.

To many people who are engaged in building operations the name of terra-cotta usually suggests nothing but a substance of a dull red hue, generally very rudely modelled into a semblance of architectural carving, with edges and arrises more or less sharp and with surfaces and joints which are intended to match but usually do not. Thus far in the history of American architecture there have been but very few attempts to shake the idea from the public mind that terra-cotta is anything but a modified form of brick, susceptible of no greater variety of treatment than can be accomplished by changes in the form. The element of color has been in one sense sedulously avoided. To be sure, the natural red to which most of our clay burns is by no means unpleasing in tone, and can be used very effectively in mass; in witness whereof, there are many buildings scattered through the land which present a very pleasing appearance, all of the moulded work and details being carried out in terra-cotta either exactly or very nearly the color of the brick used for the surrounding wall. But in a broader sense a monochrome can hardly be called color; and while every one is in one way perfectly conscious of the boundless possibilities involved in the use of different colors of terra-cotta, either from timidity or from unwillingness to be the first, there has hardly yet been a single instance where an architect has boldly departed from the tone which we are pleased to call terra-cotta red, or has undertaken anything like a general color treatment; while even with one tone we have not been anywhere nearly as successful as some of the old artists who built such structures as the Monastery of the Certosa near Pavia, where, indeed, all the terra-cotta is red, but a red so rich and transparent, and combined so effectively with the whitewashed walls and tiled floors, that one feels an appreciation of the color sense in looking at it, a sentiment which is usually quite lacking in our American attempts.

Changes, indeed, have been made in the colors of the terra-cottas which have been offered in the market. We have Perth Amboy and Anderson bricks, and terra-cottas of several varieties of tones obtained by using different materials or different mixtures in the clay, but the opportunities for a real color treatment in a building offered by any of these are quite small, and the results are in one sense uncertain. It might, however, be questioned whether the introduction of different colored materials in the manufacture of terra-cotta has been altogether desirable, as it has led to the evolution of some of the most abominable shades and tones, and to the use of mottled terra-cottas, which, while they may be fashionable, and may even please some people by reason of novelty, can hardly appeal to an artistic or cultivated color sense. We all admire the half tones and delicious shadings found on some of the old brickwork in Europe, which has been crumbling and decaying for centuries; but any attempt to imitate the old tones with new, clean, sharp-struck brick or stiffly moulded terra-cotta, while it may from a distance offer a suggestion of the antiquity which we so much admire, is anything but satisfactory upon nearer investigation; and, after all, why should we attempt to imitate what time alone can accomplish when there is so wide a field opened in another direction, — and that is by the use of glazes and enamels, — treating the terra-cotta simply as a body upon which to build up our colors, exactly as a painter uses his pigments.

The revival of interest in terra-cotta work, which was manifest some fifteen years ago, undoubtedly had its origin very largely in the ideas of such men as Ruskin, who tried so bravely to beautify the common things of life, and to show that artistic feeling was in no sense inseparable from humble materials. The strong emphasis which Ruskin undertook to lay upon what he designated as truth in construction and design, extended itself to brickwork and terra-cotta, and we were taught to admire the beauty there is in a plain, honest brick wall, so called. The attempts which have been made up to within a few years to extend the scope and possibilities of terra-cotta in its various forms, have been limited almost entirely to following out the Ruskin theory of being true to a material, and letting the material show fully and freely for itself. But there is nothing æsthetically wrong or really contrary to this theory in covering our terra-cotta with a deep gloss or a heavy enamel which shall entirely conceal and obliterate the original tone of the material; rather, there is every reason for utilizing so excellent an opportunity for producing a permanent color effect. Only a very few of our terra-cotta manufacturers have made any serious attempt to produce and market glazed and enamelled terra-cottas, but the marked success which has followed the efforts of such firms as Atwood & Grueby, of Boston, has abundantly demonstrated, not only the artistic practicability of such treatment of the material, but also its commercial desirability.

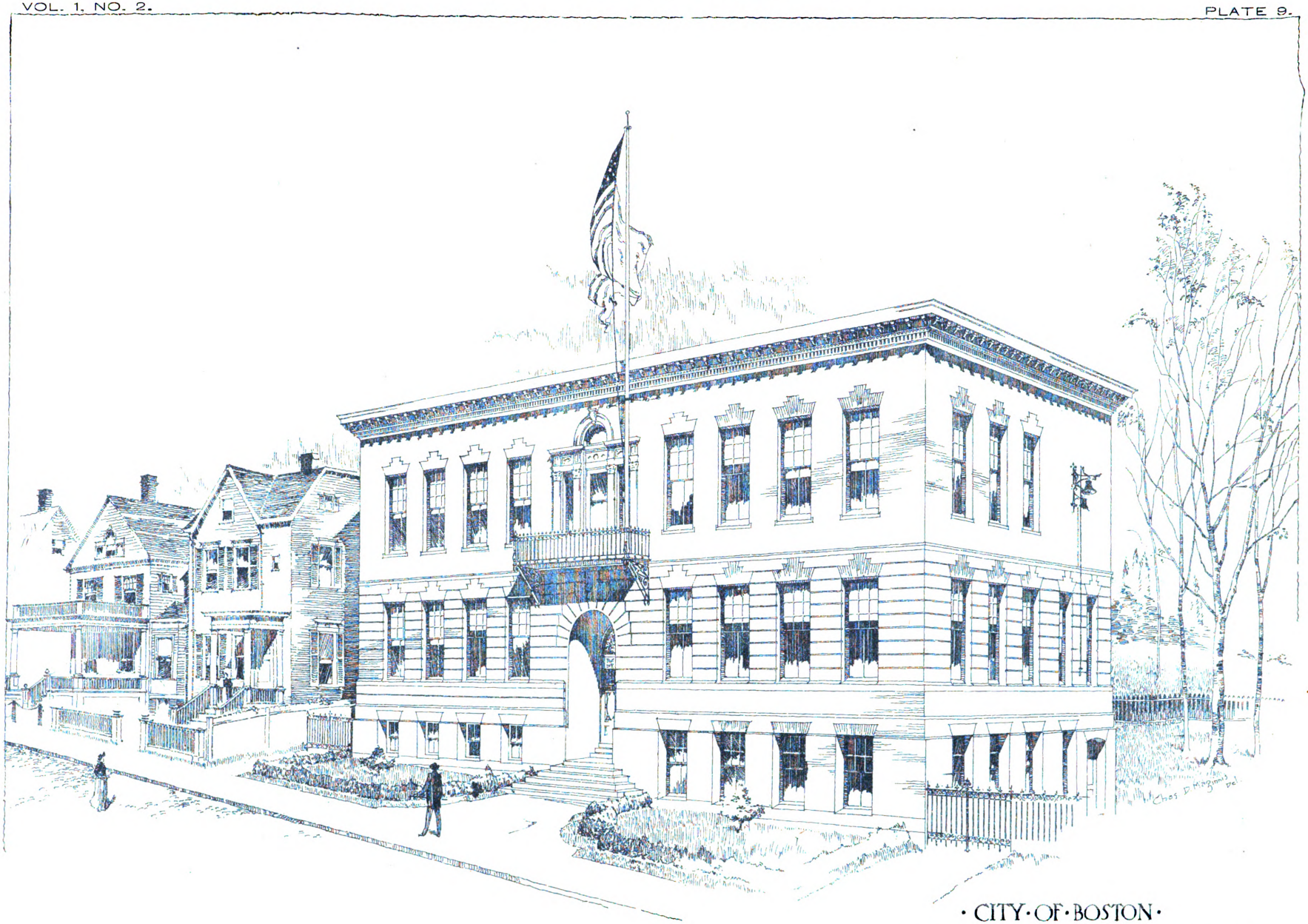
One has not very far to go to seek for historical authority and direct information in the immediate lines of glazed and enamelled terra-cotta. Scattered all through Italy are wonderful bits of enamelled work from the hands of the Della Robbias and their immediate successors. In all this work, the clay is treated simply as a body, and the colors are applied much in the same manner as pigments; and while in the case of the Della Robbias the limitations of color were very manifest both in variety of pigments and in mechanical execution, it can still very easily be seen that the same processes can be amplified until the artist who undertakes to introduce color in a building can play with his tones just as truly and with just as much latitude as the artist who paints a picture. Nor is the source of inspiration limited by any means to Italy. The wealth of color in the Alhambra, and, indeed throughout nearly every Spanish city, can be drawn upon very freely. The Pallisy ware, the Limoges enamels, the Dresden porcelains, the Delft potteries, and numerous other sources, are sufficient to give one more ideas both for color and design, than can be worked up in a lifetime. We are too prone to neglect the opportunities offered by Europe. Though American architects go there every year by the hundred, and study, in their way, most exhaustively, we find it very difficult to bring away with us a fair appreciation of the feeling which permeates the old work; and when it comes to applying color in terra-cotta, we have had as yet so little true appreciation of what it means, that the successes have been few and far between.

It may be said that these references are made entirely to tiles rather than to terra-cottas, and that is quite right; for, after all, tiles are only another form of terra-cotta. In a general sense all the ceramic arts relate to burnt clay, and in the broadest meaning of the word that is what constitutes terra-cotta; so that one may with perfect propriety transplant an idea of color from wall tiles, and apply it almost without modification in connection with glazed or enamelled terra-cotta, with the very important difference that tile work is practically limited to flat surfaces and painted details, being used in the color sense more as mass than as detail, whereas terra-cotta has practically no limitations and can be moulded, modelled, cast, or preserved in plain huge masses.

The Portuguese have shown a great deal of cleverness in some lines of exterior ceramic decoration. The houses in Lisbon, particularly, are nearly all faced on the outside with enamelled tiles made of a very porous and low-grade terra-cotta. Sometimes the effect is very striking. A single tone is never employed, blue patterns on a white ground or combined with lemon yellow or various shades of green being most commonly used, though blue is the predominant color. Sometimes an unbroken dark sulphur color is used over an entire front with very marked success. It would hardly do to say that such a method might be transplanted directly to the United States with any degree of assurance, but there is no doubt of our color sense being quite undeveloped, or, perhaps more truly, we are afraid of it and haven't yet dared to stretch out our hands and use the opportunities which enamelled terra-cottas offer. It might fairly be asked whether, after all, we need it; whether the plain red bricks, or possibly the mottled bricks, or the uniformity of tones of our building stones do not offer sufficient opportunities of color to meet the requirements of our climate and of our methods of business. Perhaps the best way to answer such a query would be to look at what has been done in the past. Before undertaking a new departure it is always wise to see what every one else has accomplished in the same line, and to endeavor as far as possible to profit by what has been found advisable under similar circumstances elsewhere. Throughout the whole of the Grecian and Roman architectures, the two styles which, perhaps, we are least apt to think of as attempting a coherent color treatment, we find unquestionable evidence that the buildings were never left in plain monochrome; that even with such structures as the Parthenon, which, in a poetic sense, has been thought to stand out like a bit of pure white marble against the blue sky, the beauties of the architecture, the true significance of the details, were in reality always reinforced by a very liberal use of color. Certainly the Gothic and Renaissance periods, to say nothing of such styles as the Persian, Indian, or Moorish, were full of color in every sense; and it is only within the last century that our external architecture has been dulled down into a uniformity of tone and the element of color entirely disregarded. There is a big gap between the rich, exuberant coloring of the Rococo period, when marbles, frescoes, gildings, and every con-

RESIDENCE OF CHARLES J. PAGE, ESQ., WESTLAND AVENUE, BOSTON.

H. Langford Warren, Architect.

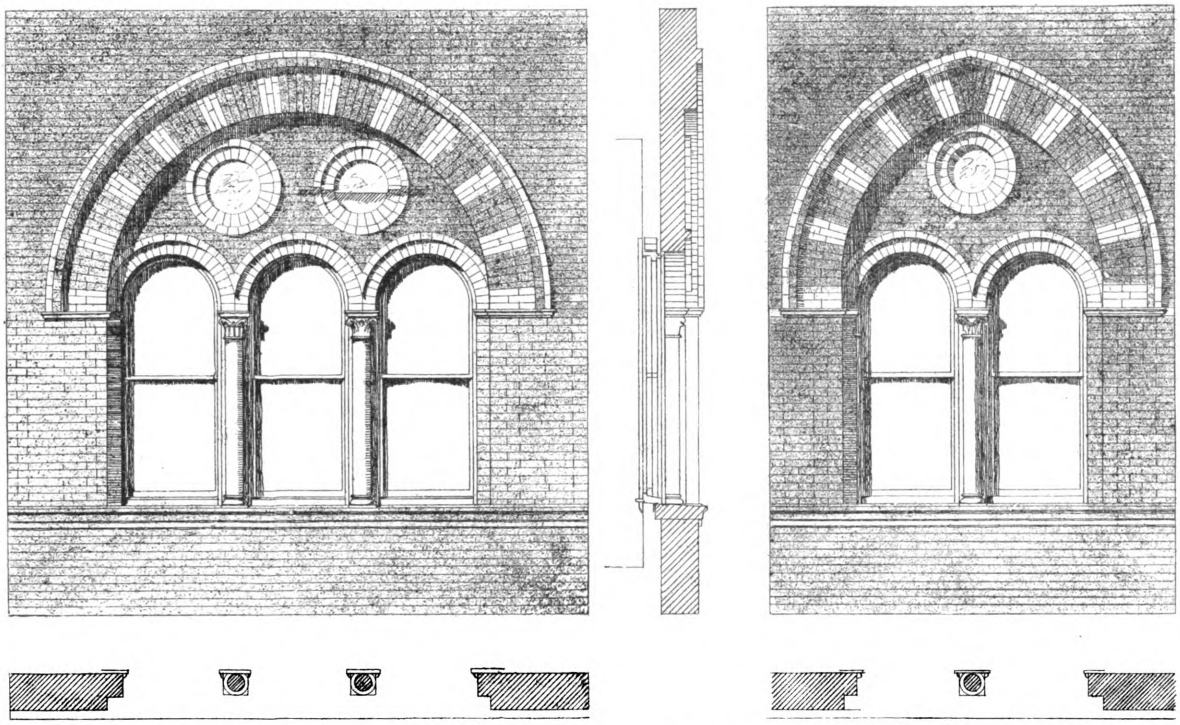


· CITY · OF · BOSTON ·

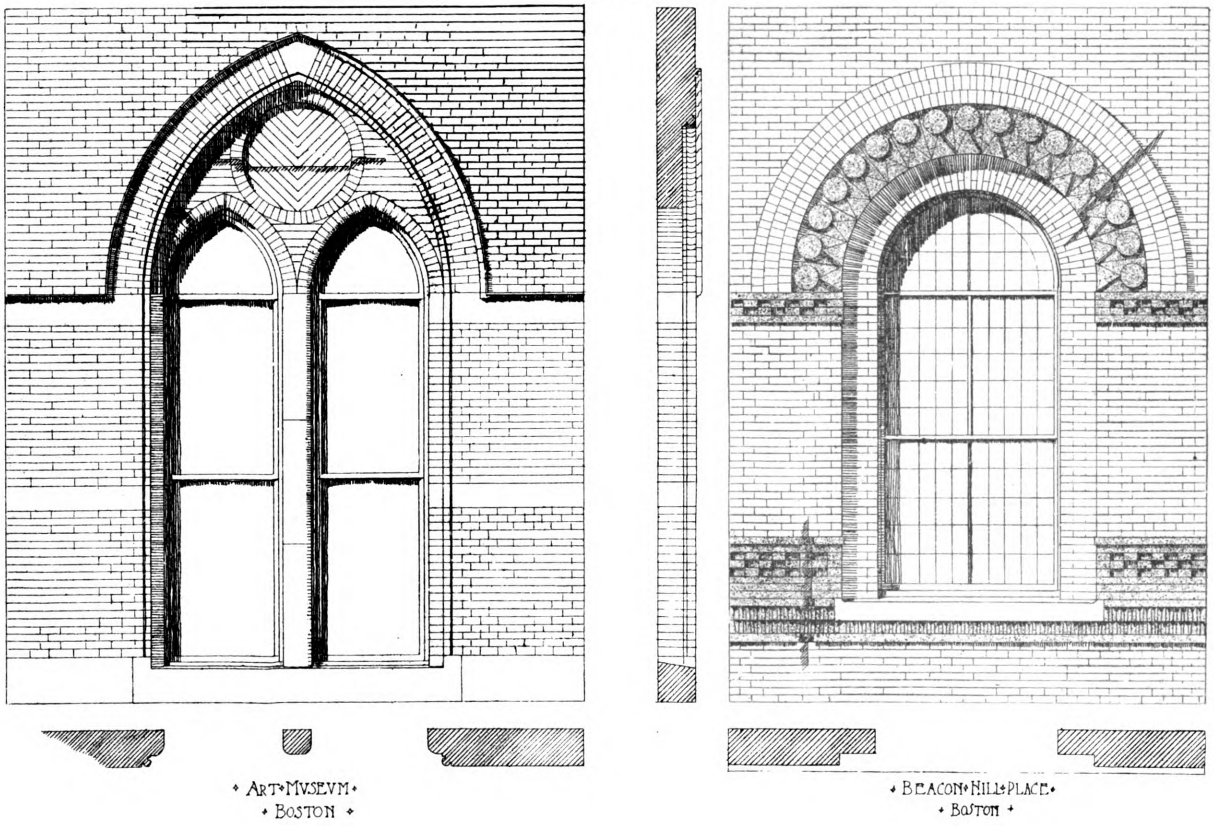
PRIMARY SCHOOL AT GLEN ROAD

EDMUND M. WHEELWRIGHT

CITY ARCHITECT



FROM HOTEL LUDLOW
BOSTON
SCALE 1/4 IN.=1 FT.

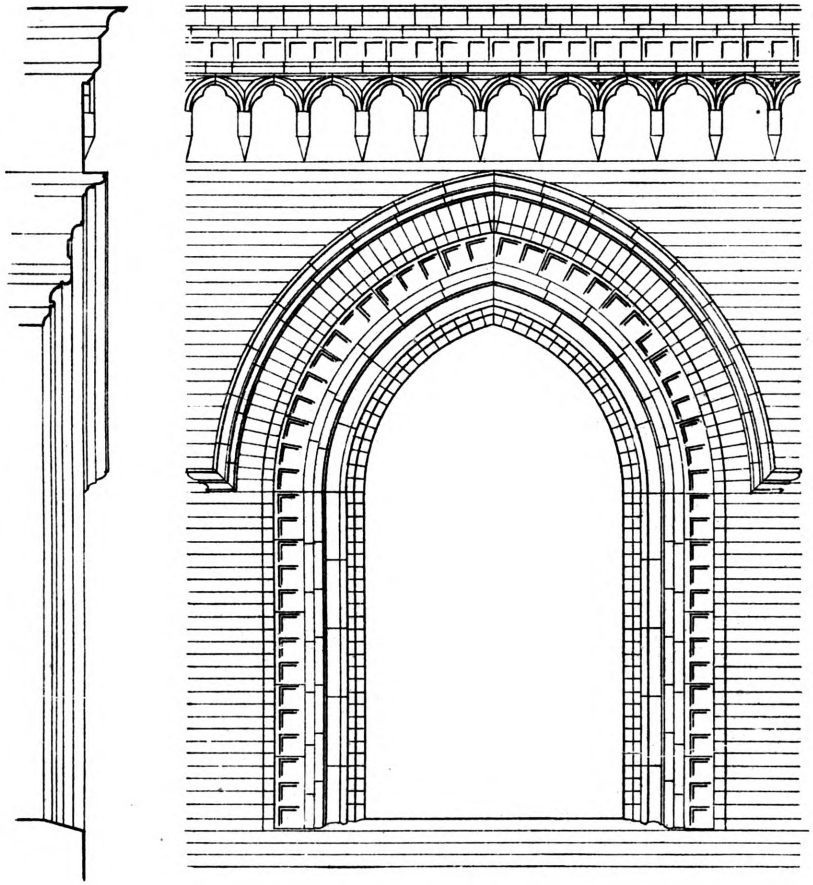


ART MUSEUM
BOSTON

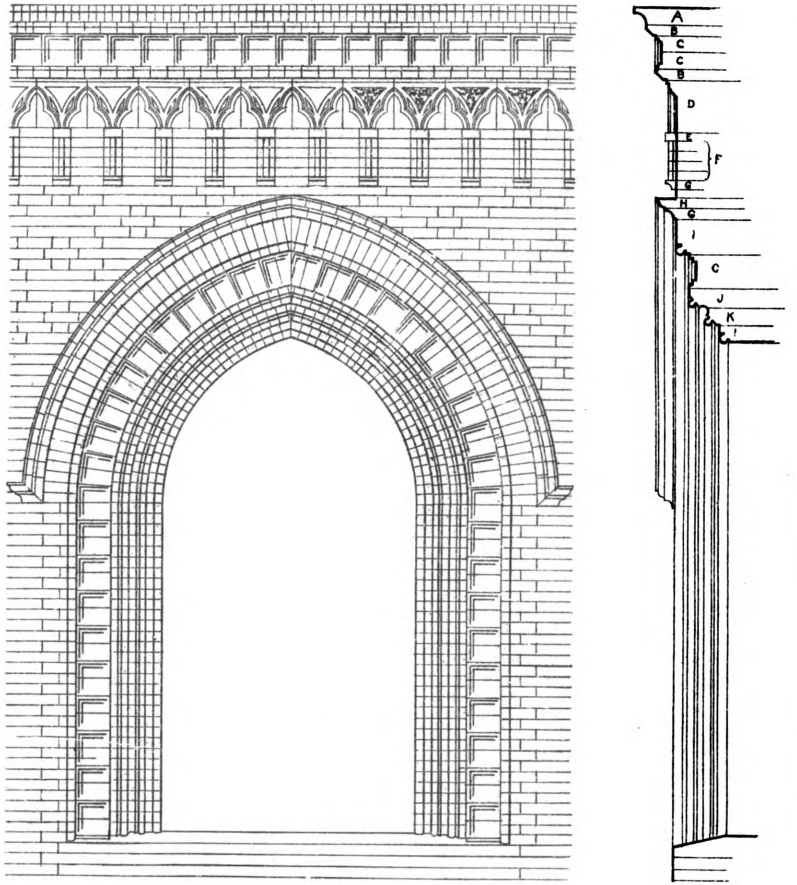
BEACON HILL PLACE
BOSTON

G COMPANY.

SOME BOSTON WINDOWS.



Window from the Broletto at Brescia.



Window designed from Stock Patterns.

The design on the right is made up from the patterns shown in the Peerless, Anderson, Hydraulic-Press, Glens Falls, and Ittner Catalogues; the letters in the section referring to the catalogue numbers, as follows:

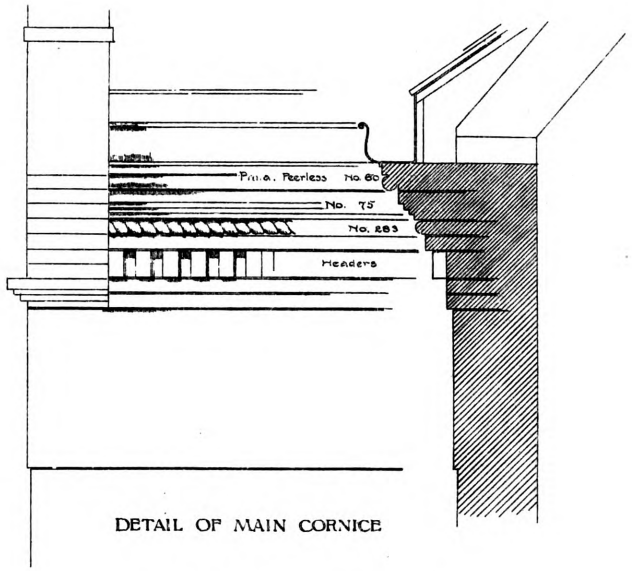
A. Anderson, 663; Peerless, 1; Ittner, 37; Glens Falls, 8.
B. Peerless, 58; Glens Falls, 34.
C. Anderson, 441.
D. Peerless, 160.
E. Plain Pressed Brick.
F. Peerless, 29.
G. Peerless, 23; Hydraulic-Press, 10; Glens Falls, 36.
H. Anderson, 550.
I. Peerless, 60; Hydraulic-Press, 17; Glens Falls, 53.
J. Peerless, 15*a*.
K. Peerless, 15*b*.

FRONT ELEVATION

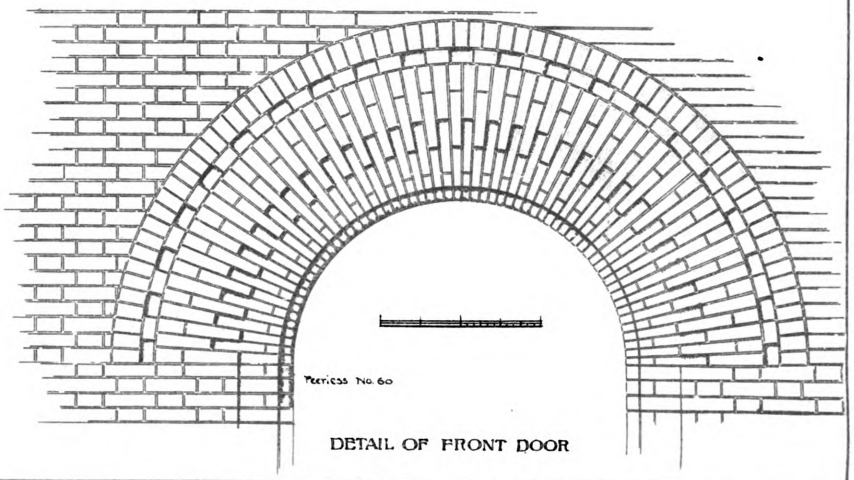
RESIDENCE OF C. J. PAGE, ESQ., WESTLAND AVENUE, BOSTON.

H. LANGFORD WARREN, ARCHITECT.

END ELEVATION

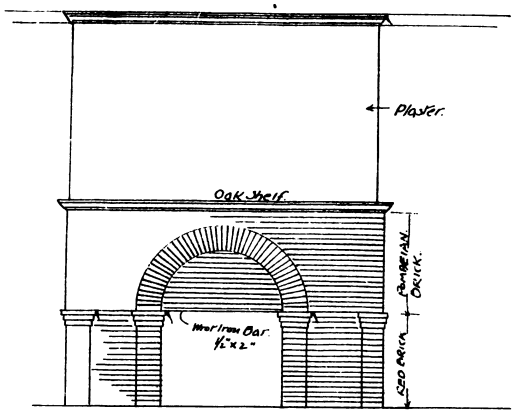


DETAIL OF MAIN CORNICE

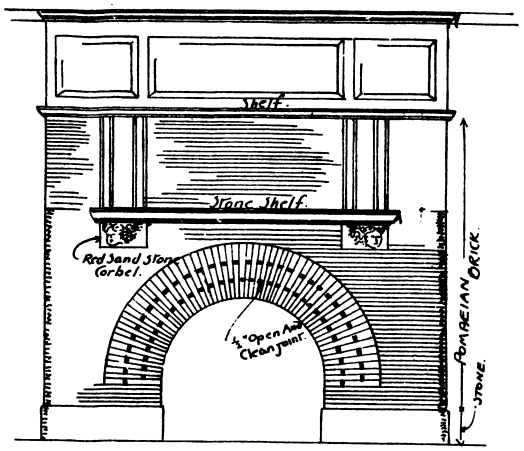


DETAIL OF FRONT DOOR

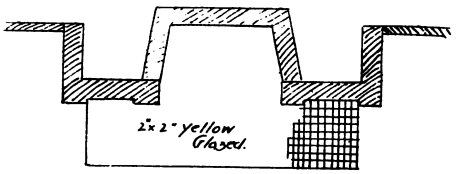
RESIDENCE OF C. L. PAGE, ESQ., WESTLAND AVENUE, BOSTON.



IN OFFICES-THIRD FLOOR.

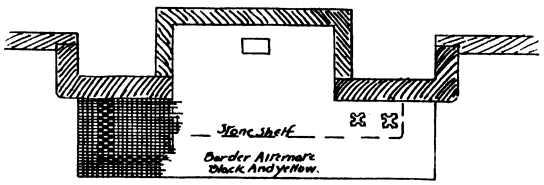


·IN LIBRARY·

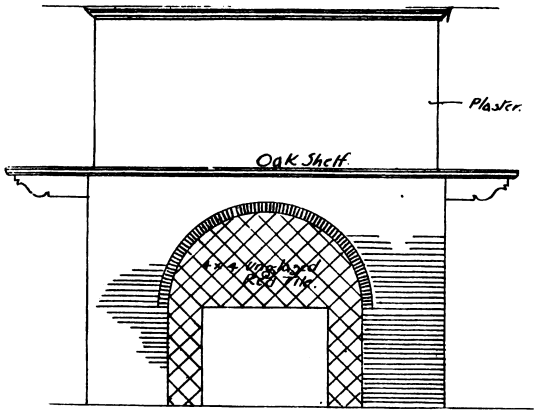


PLAN.

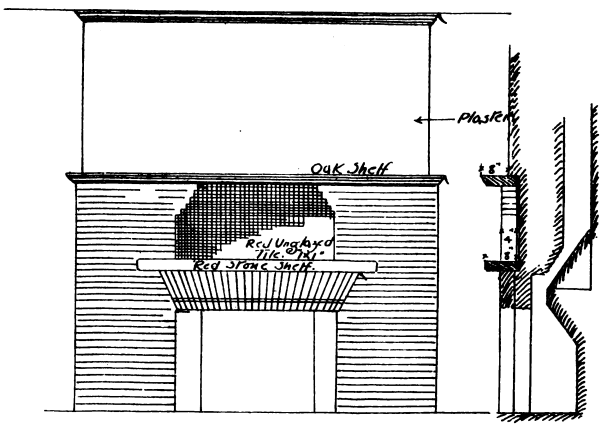
·BRICK MANTELS IN YMCA BVILDING·
·CLEVELAND·O·
C·F SCHWEINFVRTH ARCHITECT·



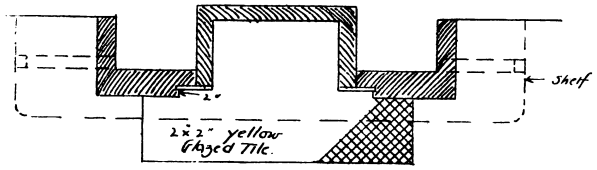
PLAN



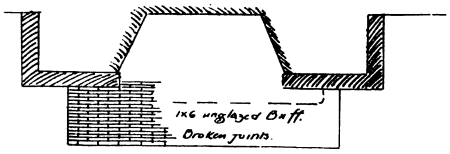
SMALL OFFICE 3rd FLOOR·



IN LARGE OFFICE 3rd FLOOR



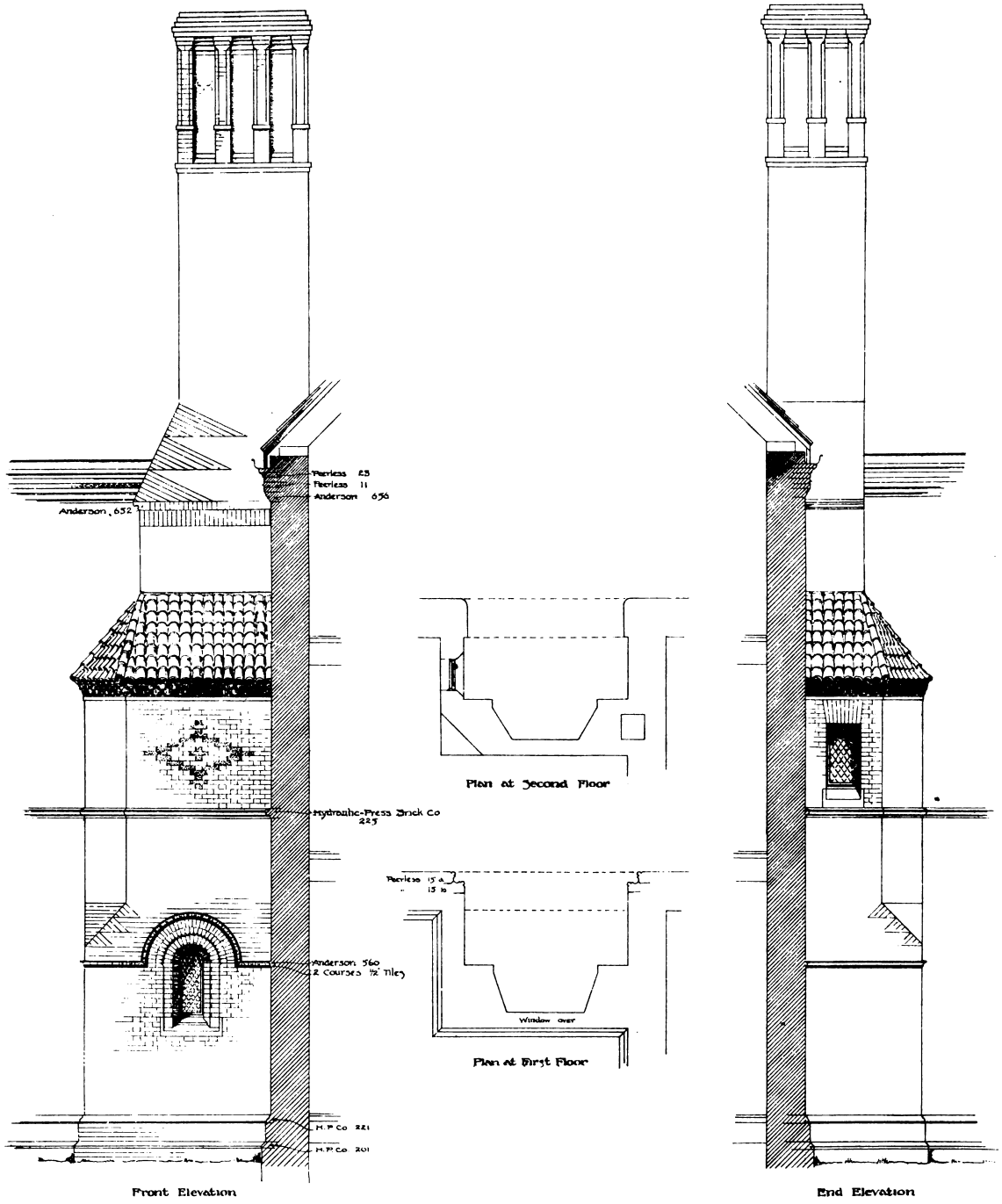
PLAN.



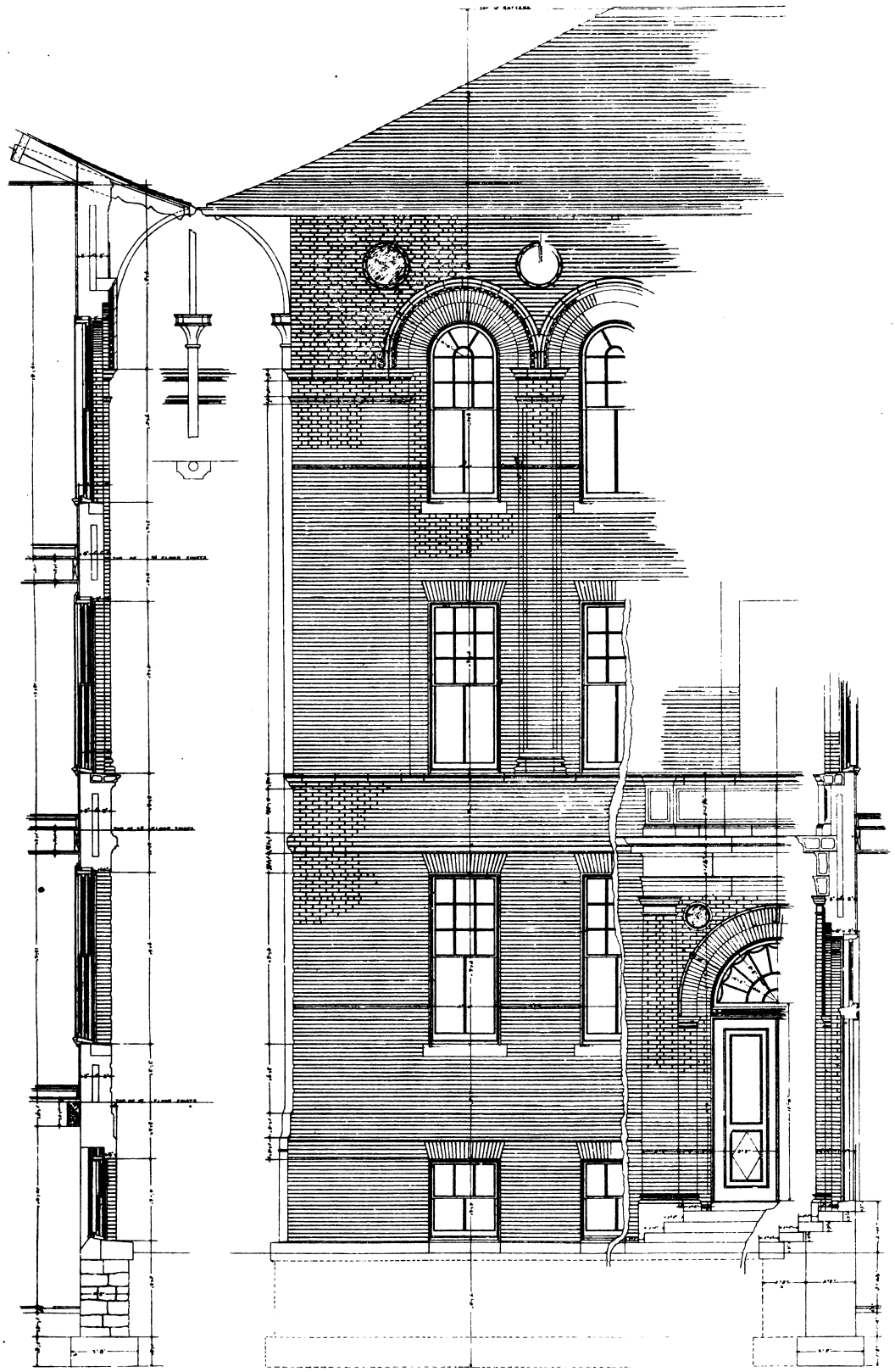
PLAN.

BRICK MANTELS.

C. F. SCHWEINFURTH, ARCHITECT, CLEVELAND, OHIO.



DESIGN FOR AN OUTSIDE CHIMNEY.



AGASSIZ GRAMMAR SCHOOL.

E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON.

ceivable form of colored material were used with a most lavish hand, to our present period when only a few struggling manufacturers are trying to stimulate a demand for more latitude in external color work, while our architects seem content to use but a single material in carrying out ideas of civic buildings. If we are to use color in our street architecture, stone will never satisfy. Marble in our climate will not stand. There remains only enamelled terra-cottas, which, however, offer so wide a field and are so boundless in their possibilities that if we do not in the next quarter century evolve a more coherent and successful treatment of color for the exterior of our buildings, it will not be for lack of opportunity or materials, but entirely from lack of our own appreciation.

But it cannot be reasonably doubted that we are on the eve of a very marked revolution in this respect. Any one who has followed the growth of the buildings which are being prepared for the World's Fair at Chicago, cannot but be struck with what might be called the spontaneous color outbreak which has been manifested in all of the documents published so far; and this seems to have come simply as a result of starting with the use of plain white plaster for all the details of the building. So simple a foundation cannot but suggest clear, brilliant tones, and brilliant coloring has been the prominent tendency of all the schemes of the exposition which have been made public. Of course, enamelled terra-cotta is only one vehicle for the expression of color in architecture, and it is doubtful if the authors of any of these color studies had any specific materials in view; but not even the richest and most variegated marbles could answer for the purpose quite as completely. There is no doubt that the exhibition will prove quite as marked an encourager of art in this country as was the Centennial Exhibition at Philadelphia, and to judge by present manifestations, we are on the eve of a regeneration in the use of color for exterior architecture, a regeneration in which enamelled terra-cotta is sure, perforce, to play a leading part.

The mottled and dull clouded terra-cottas which have been so much used of recent years have had a retarding influence upon the development of applied color to terra-cotta, in that they have started in the wrong way. The architect who undertakes to introduce color in exterior design must first of all think in color, think in a variety of tones, and not limit himself to mere monochrome or single colored material. And then he must start as an artist does with a picture, with white as a basis, building down to the strong tones and only using the mottled effects and the deep coloring to accentuate the lighter and transparent tones; in other words, work just as Della Robbia and Pallisy did in the old days. All of their colors were opaque enamels laid over plain terra-cotta. We can do exactly the same to-day, and work down from light to shade rather than from shadow to light.

But, after all, comes the commercial question, is it wanted and will it pay? No one would undertake to advise covering all of our buildings with enamelled terra-cotta. Nor would one undertake to say that terra-cotta in any shape would be the proper thing for all places and all times; but there come to every architect in his practice opportunities which demand pronounced color treatment, — a theatre front, the vestibule of a hotel, a high frieze around some tall office building, Turkish bath rooms, a safe deposit office, and other similar cases wherein color should show as an essential part of the scheme, but where it must be in the form of something more lasting and less destructible than either paint, wood, or plaster. To a certain, but quite limited, extent this can be accomplished by the use of marble, but on the other hand almost everything that is possible with marble can be carried out a great deal better by enamelled terra-cotta. Whether it pays the manufacturer to undertake such work is a pretty serious question. Probably it does not pay at the beginning, but ultimately, when we as a people are made more awake to the possibilities, when we expect that a building of a public nature, or a light and cheerful destination must be treated in bright and lively colors harmonious in tone but strong and lasting in effect, there is no doubt that enamelled terra-cotta will then very largely usurp the place which is now occupied only by the dull monochromes which we are content to call terra-cotta. It must be done thoroughly, however. We must admit that enamelled terra-cotta is no longer an experiment; that any desired tone can be obtained, and that the artist who undertakes to use it is not obliged to limit himself to the colors found on sample cards, but can let his fancy run at riot as he pleases, with a surety that the result can be carried out to a shade with the various enamels. We must admit that the field is boundless, that terra-cotta is not to be regarded simply as burnt clay, but as a vehicle for permanent color effects. If the manufacturers who have thus far done so well with enamels can follow out the lines they have started, and can give the designer all the latitude of which the material is capable, there is no doubt of the result.

C. H. Blackall.

TWO LETTERS.

New York, March 26, 1892.

To the Editors of the Brickbuilder:

Gentlemen, — I received some days since a copy of the January number of The Brickbuilder, which has been read with much interest.

The paper is a credit to its publishers, occupies a new field, and should become useful to architects and brick manufacturers.

Mr. Warren's article, entitled "A few Neglected Considerations with regard to Brick Architecture," was read with special interest. It is full of important suggestions of great value, with most of which I fully agree. His ideas regarding the variation in shades on large wall spaces, so as to pattern after nature and avoid a mechanical uniformity, are those of Mr. J. C. Anderson, who has rendered the architects of this generation such invaluable service by his years of labor and research in the art of clay working.

He has long been trying to impress it upon our architects and builders, and no one will rejoice more than he to find so powerful a pen as Mr. Warren's enlisted in the same cause. What a triumph it will be for the culture of our time, and what a monument to the genius of its architects, when they fully comprehend the possibilities now largely hidden in the humble brick.

Then in place of dull, characterless walls we shall have the rich tints of the autumn foliage, combined as nature intended, in color harmony. The fire will bring these out in clay as the sun does on the forest leaves, and the artist will arrange them so as to produce the desired effect.

In Mr. Warren's suggestion that superior effects can be obtained by using common brick for the large wall spaces, using pressed brick only for ornamentation and trimming, you will pardon the assumption of a layman, when I venture to say "he is clear off." That must come from his environment. It is a Boston fad, as also his erroneous suggestion that the common brick possess greater strength. While Boston produces an excellent common brick, much superior in strength to the average, yet Gen. Q. A. Gillmore (a high authority) gives the strength of strong red common brick as 1,100 lbs. per square inch, while the tests made by Capt. Lyon at the U. S. Watertown Arsenal, of the Anderson pressed brick, gives the *average* of this manufacture 11,944 lbs. per square inch, and in some of the tests made they ran up to 16,991 lbs. per square inch, showing strength greater than granite. So much for the relative strength of common compared with pressed brick. The shades and tints of pressed in variety and character are superior to common, owing to the greater heat employed in burning. The reason this has not been discovered is because of the separation of each shade into uniform lots in sorting, which Mr. Warren so justly complains of, and the use of a single shade on the walls; but the variety is there all the while awaiting the advent of an artist to use them, but until he appears, dull uniformity will be the rule.

A common brick wall ornamented with pressed brick is very much like a flounce of silk on a body of calico, or a broadcloth swallow-tail coat over coarse, dirty pants tucked into cow-hide boots. They may be striking, but hardly artistic.

The advocacy of such a combination it seems to me is subversive of what we all should most desire, the elevation of our standards.

Again, are our architects and art critics willing to admit that the highest excellence can only be attained by taking the work of past generations for our models? That this age is tied to the apron strings of craftsmen whose bones long since have turned to dust? That because our fathers put a stone in one end of the sack to balance the corn in the other, as the horse bore it to the mill on his back, the same method should meet the wants of their sons?

Are we inviting the world to our shores next year to witness the progress of art during the past four centuries, to show them nothing better than cheap imitations of their old buildings and cast-off ideas?

We certainly have a right to expect better things and the advocacy of more independence and originality from The Brickbuilder. It should point the road on which our young American architects and craftsmen may achieve a success that will carry their names with honor to coming generations as master builders. It

should show that appreciation and encouragement of the efforts of those manufacturers who, like Mr. Anderson, are by their genius and labor, producing material fit for the builder's use; for it must be remembered that it is only by the co-operation of the architect with the producer of the material that enters into a structure that the greatest measure of success can be obtained.

Wishing THE BRICKBUILDER success in the full measure it may deserve it, I remain, Yours truly,

J. C. CUSHMAN,
Secretary New York Anderson Pressed Brick Co.

To the Editors of the Brickbuilder:

GENTLEMEN, — The letter of your correspondent, Mr. J. C. Cushman, of the New York Anderson Pressed Brick Co., in the course of which he makes some strictures on the views expressed in my article in your last issue, is a curious example of that mode of thought in this country to which our worst architectural failures are mainly due, and I am only glad of an opportunity to combat directly views which seem to me so misleading, but which one rarely has the good fortune to find so frankly and concisely stated. There are three principal mistakes or confusions of thought which run through your correspondent's letter. In the first place he confuses mechanical excellence with artistic beauty; in the second he seems to regard originality (or more clearly stated, mere novelty) as the most desirable artistic quality, and in the third place he fondly imagines that advance in art is possible without reference to the works of past generations. Now these opinions are precisely those which have made difficult the path of the true artist, the sincere lover of the beautiful in this country, and which have, perhaps more than anything else, tended to retard our artistic growth.

The truth is, we live in a mechanical age and country. Our greatest achievements are in the domain of mechanical, not of artistic, excellence, and as our mechanical and scientific advance has been so stupendous, so wonderful, it is perhaps not unnatural that, in the popular mind at least, the point of view of the mechanic arts in which we so greatly excel should be transferred to the fine arts in which our achievement is so meagre and in which our interest is so slight.

But let me endeavor to answer your correspondent's criticisms one by one. I wish the statement that the artistic use of common brick is "a Boston fad" were borne out by the facts; but alas! the wilderness of uninteresting and monotonous pressed-brick fronts in most of our new streets makes this flattering opinion hardly tenable. The few exceptions to be found here and there by such men as the late H. H. Richardson, McKim, Mead & White, and Sturgis & Cabot are by men who took their suggestion, not from Boston environment, but from a careful and sympathetic study of the old brickwork of Italy, France, England, or the Netherlands. Mr. Cushman will not find anywhere in my article any suggestion that common brick is stronger than pressed brick. I am well aware of the greater crushing strength of the latter, but I should like to ask what constructional purpose is served by giving a wall a thin facing of a material having a crushing strength of about 12,000 pounds to the inch, when the centre and back of the wall, which bear most of the weight (in the usual method of facing buildings, practically all the weight), has a crushing strength of only 1,100 pounds per square inch, or often less. Moreover, the crushing strength of brickwork is a different matter from the crushing strength of individual bricks.

Your correspondent thinks the variety and character of the shades of pressed brick are superior to common. The colors of pressed brick are, it is true, more intense and each brick more even in color than common brick, and it is precisely on this account that I prefer the common brick for broad wall surfaces in most instances, especially, as I said in my article, in the country, where pressed brick always looks so much out of place, precisely on account of its superior mechanical and inferior artistic quality. The common brick is quieter, softer in color, and its rough texture as against the smoothness of pressed brick gives greater beauty to the wall surface in which it is employed. The objection to the use of pressed brick as a trimming for common brick is certainly not well founded, and one has but to remember the beautiful effects obtained by the use of stucco with brick, stone, or marble trimmings, or brick with marble or stone trimmings, to see the irrelevance of Mr. Cushman's comparisons. In the moulded and ornamented parts of a building a material capable of high finish and delicate detail is usually required; in the wall spaces a material that shall be pleasant in color and texture. That Mr. Cushman regards such combinations as tending to lower our standards would indicate that the standards he has in mind are purely mechanical ones. But the object of my article was mainly to insist on the unused possibilities of design in the common brick. I distinctly admitted in my article that in our *cities* the pressed brick front may be in place, but that when it is used, the brick should be unculled (except as regards quality), and in this I am glad to find that Mr. Cushman agrees with me. In our cities the demand for mechanical excellence usually requires the use of pressed brick; but it should be distinctly recognized that it is a mechanical, not an artistic standard that requires this. Our people do not like the appearance of anything that is not mechanically perfect. I do not say that this is not perfectly right (when other considerations do not outweigh), but I do say that it has nothing to do with artistic excellence or æsthetic beauty.

Mr. Cushman's question, "Are our architects and art critics willing to admit that the highest excellence can only be obtained by taking the work of past generations for our models?" must receive a decided affirmative answer. Not only is this now the case, but it always was and always must be the case. Whenever art has been forced by circumstances to take a new start it has had to wait till it had a generation or two of tradition at its back, before it attained to the highest excellence, and even in that new start it has leaned on such knowledge of past art as circumstances brought to its hands. Such a question as that of your correspondent could hardly be asked by one who was familiar with the history of architecture in the past or who really understood the significance of what is being accomplished by our best architects to-day; and he would find on examination that those of our architects whose works rank highest with competent judges, and who are most conspicuous for the truest originality, are precisely the men who have the most intimate knowledge of the great achievements of past art, and whose work is consciously founded on the close and loving study of the work of "craftsmen whose bones," as Mr. Cushman says, "long since have turned to dust."

When we are able to equal in artistic excellence the work of these craftsmen, we shall be less likely to regard their achievements as "cast-off ideas," and such measure of architectural success as the buildings for the Chicago World's Fair attain, to which your correspondent refers, will be accomplished — is being accomplished by a frank and avowed following of the most approved of old-world models, adapted and moulded by new-world requirements and methods, and modified by new-world ideas. These are the methods and the only methods by which artistic advance is possible to us. I must insist again upon the statement with which I closed my article. "In developing our own brick architecture we cannot do better than turn to the noble brick buildings of the past, in the endeavor to learn the principles that underlay its developments, and in the hope and belief that these principles will receive more beautiful exposition in the future."

That the work of such men as Mr. Anderson is aiding in the advance to which I look forward, I am very glad to acknowledge, and the beauty of finish and range of color which his brick give us are a distinct advance, for which architects may well be grateful. I am strongly of the belief that the same scientific knowledge and the same patient research will yet accomplish more than has yet been accomplished with the common brick in beauty and variety of color. It seemed worth while to answer your correspondent's letter at some length because the views he expresses are founded on misconceptions which are so common and so unfortunate, as it seems to me, in their results. Mechanical excellence is a desirable thing, but a designer may be pardoned for regarding artistic beauty as a superior consideration where constructional requirements are not in question.

Yours truly, H. LANGFORD WARREN.

THE BRICKBUILDER COMPETITIONS.

In accordance with the statement made in the January number THE BRICKBUILDER announces the first of a series of competitions. Messrs. E. M. Wheelwright, R. C. Sturgis, and H. L. Warren have consented to act as judges, and on their award THE BRICKBUILDER will give the prizes offered in each competition. The award will be announced in the issue of THE BRICKBUILDER next following the receipt of the drawings, and the prizes will be immediately distributed.

All drawings must be sent prepaid, addressed to the office of the Brickbuilder Publishing Co., 4 Liberty Square, Boston, Mass. They must be marked with a motto or cipher and accompanied by a sealed envelope with similar cipher, which shall contain the author's name and address. These envelopes will not be opened until after the award is made. The publishers of THE BRICKBUILDER reserve the right to publish any or all of the drawings for which prizes have been given. Prizes will be given only to the authors of such drawings as the judges consider of merit.

COMPETITION NO. 1.

AN ARCHED ENTRANCE.

Programme. A fraternal order or society in a large town proposes erecting on a lot of fifty feet frontage on the principal street, a two-story brick building, the ground floor of which will be given up to two stores, and an entrance way and stairs leading to the rooms of the society located on the floor above. The entrance will be in the centre of the façade, and will have an opening no less than six feet wide. The first story will be fourteen feet high from the sidewalk to the top of the girders, carrying the wall over the store show-windows. The line of the second floor will be indicated by an ornamental course directly above the girders. The ground floor will be six inches above the sidewalk. Each store must have a clear space between brick piers, for entrance and show-windows, of at least fifteen feet. The problem is to distribute the brick wall surface into piers and abutments to the arched entrance, and to design this entrance, using bricks of the ordinary size and moulded bricks from any of the catalogues of well-known makers, the catalogue number and maker being indicated in each case.

Required. A general lay-out of the first story at a scale of one fourth of an inch to the foot, the door being carefully indicated; also a detail drawing of the door at a scale of one inch to the foot, showing elevation and section, with such other details as are necessary to explain the design. A perspective sketch, on a separate sheet, may accompany the drawing, but it is not required. All drawings to be made in black ink on Bristol-board, hot-pressed Whatman or Leonine drawing paper.

Date. All drawings must be received at the office of THE BRICKBUILDER not later than May 12, 1892.

Prizes. Upon the award of the judges the publishers of THE BRICKBUILDER will distribute the following prizes: First prize, $10; second prize, $7; third prize, $5; five fourth prizes consisting of subscriptions to THE BRICKBUILDER for 1892.

IMPORTANT. As it is proposed to publish successful designs in THE BRICKBUILDER, no drawings will be considered that are not arranged on the sheet with a view to their reducing and grouping well on a BRICKBUILDER plate, the proportion of which is as three is to four.

COMPETITION NO. 2.

A TWO-STORY STORE FRONT.

Programme. The building is to be built between two party walls, on a lot having a frontage of twenty-five feet. The first story will contain a store and the entrance to the floor above which may be used for business offices or as the merchant's residence. The first story will be fourteen feet high in the clear, the other story ten feet. The building will be simple in design and will be built of brick. Moulded brick will be only sparingly used in cornice and strings, and perhaps about the windows and doorway, the catalogue number and maker being in each case indicated.

Required. An elevation of the building at a scale of one fourth of an inch to the foot, with details on the same sheet at a scale of one half inch to the foot, showing sections and elevations of cornices, strings, or other features. Drawings must be in black ink on Bristol-board, hot-pressed Whatman or Leonine drawing paper.

Date. All drawings must be received at the office of THE BRICKBUILDER not later than June 1, 1892.

Prizes. First prize, $25; second prize, $15; third prize, $8. Three fourth prizes consisting of one book, the designer's selection, from the following list: Treatise on Masonry Construction; The Five Orders of Architecture, according to Vignola, editions of Bates, Kimball & Guild or W. T. Comstock; Boston Architectural Club Sketch Book; either of the three volumes of the Technology Architectural Review; A. Parlett Lloyd's Building; Petit's Architectural Studies in France; either volume of Berg's Safe Building; Ware's Perspective; Kidder's Pocket Book, 1892 edition; both volumes Roger Smith's Handbooks of Architectural History. Five fifth prizes consisting of a subscription to THE BRICKBUILDER for 1892.

IMPORTANT. As it is proposed to publish successful designs in THE BRICKBUILDER, no drawings will be considered that are not arranged on the sheet with a view to their reducing and grouping well on a BRICKBUILDER plate, the proportion of which is as three is to four.

THE ILLUSTRATIONS.

Plate 9. Primary School at Glen Road, Boston, Mass. Edmund M. Wheelwright, City Architect.

The design is quiet and dignified, but is not as successful as most of Mr. Wheelwright's recent school buildings. Though executed in brick it is not a characteristically brick design, but rather suggests stone.

Plate 10. Some Boston Windows.

The two windows from Hotel Ludlow (Mr. C. Howard Walker, Architect) are of red and yellow brick; the circular disks are of marble. They are an example of the charming effect to be obtained by the use of plain unmoulded brick.

The window from the new wing of the Boston Museum of Fine Arts (Messrs. Sturgis & Cabot, Architects) is a good example of a simple gothic window.

The window from the building on Beacon Hill Place is of brick painted yellow, and is rich in effect; though the means employed are simple. It is of yellow brick with red brick trimmings. Messrs. Allen & Kenway were the architects.

Plate 11. A Comparison of Windows.

This plate shows a fine example of an Italian gothic window, from the Broletto at Brescia, precisely as it exists, redrawn for THE BRICKBUILDER from Prof. Strack's work on Italian brick architecture, and to the right of the plate is the same window as closely as it can be reproduced by using modern brick. All the bricks in this window are made by one or other of our well-known manufacturers of pressed and moulded brick. The schedule on the plate shows the makers and catalogue numbers of the bricks used. A study of the old and new is instructive and reveals, among other things, the strange absence from the brickmakers' catalogues of well designed brackets, and the want of some very simple but useful mouldings.

Plates 12 and 13. Residence of Mr. C. J. Page, Westland Avenue, Boston. Mr. H. Langford Warren, Architect.

This house is built of common brick with pressed brick trimmings and mouldings. The columns in the windows are of marble. The diaper pattern is obtained by using two kinds of common brick from different kilns, having a somewhat different color, the diaper being much yellower than the ground.

Plate 14. Brick Mantels. Mr. C. F. Schweinfurth, Architect, Cleveland, O.

These simple mantels are suggestive examples of what may be done by a straightforward use of brick and tile.

Plate 15. Design for an Outside Chimney.

This chimney is supposed to stand in a re-entrant angle of a house. The moulded brick used from the trade catalogues are indicated by notes in the drawing.

Plate 16. Detail of the Agassiz Grammar School, Boston, Mass. Mr. E. M. Wheelwright, City Architect.

This most interesting design is characteristic of the excellent work being done by the present city architect of Boston. It is admirably proportioned and refined in detail, and the treatment throughout is characteristic of the material employed. Of especial interest is the decorative use made of different bonds. In the ground story a bond of headers every six courses is used, and to emphasize still further the horizontol bonds thus formed, the courses of headers are recessed half an inch from the wall face. This story is laid in red mortar. The next division of the design is laid in Flemish bond, in yellow mortar, while the frieze above the third story windows is laid in white mortar, in a very decorative French bond consisting of a course of three headers, a stretcher, a header, a stretcher, three headers, and so on, as may be seen by the drawing. Marble disks are used as decoration in the frieze, and on each side of the doorway.

Supplement. Photograph of the Residence of Mr. C. J. Page, Westland Ave., Boston.

This supplement is to show the actual house, the scale drawings of which are given in plates 12 and 13.

Our supplement for next month will be a photographic reproduction of the famous Baptistery of S. Stefano at Bologna, which is the first of the series announced elsewhere. An interesting description will accompany the plate.

FOUNDATION WELLS IN INDIA.

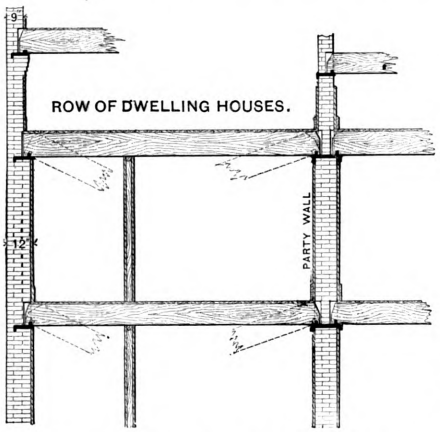
Piling for the foundation of buildings appears to be entirely unknown in Hindostan. The ordinary mode for securing a foundation, where the superstratum is tenacious and rests upon loose sand, is to dig a well until water is reached; a curb of timber is then placed, and upon it a cylinder of brick, 7½ exterior and 3½ feet interior diameter, is built to the height of 3 or 4 feet above ground. As soon as the masonry has hardened sufficiently, the well-sinker fixes a plumb-line to the top of the cylinder as a guide and descends within-inside, carrying an instrument called a "Phaora, or Mamooti," somewhat similar in shape to a hoe; with this he excavates the earth until the water is too deep; he then commences the use of the "Jham," which resembles the "Phaora" in shape, but is about 36 inches long and 27 inches wide, and is suspended to a cord passing over a pulley above the cylinder. Upon this instrument the well-sinker descends, and, diving into the water, excavates with the "Jham" the soft earth under the sides of the curb, and is at intervals drawn up with the instrument. The cylinder descends gradually from 6 inches to 2½ feet per day, as the earth is withdrawn from beneath it, and relays of workmen keep it constantly going, lest the sand should settle around it and cause it to hang up. The natives are very expert in this operation, and not unfrequently remain under water more than a minute at a time. The cylinders have been sunk as deep as 40 feet, but with extreme labor. A series of these wells being sunk at intervals of one foot between them, they are filled with a grouting of lime and rubble-stone, and separately arched over; arches are then thrown transversely from the centre of each parallel pair, and another set of arches turned over the adjacent wells longitudinally; the whole is then covered with masonry, and the pier or other building raised upon it. Such foundations are found to answer perfectly in situations where almost any other kind would be washed away.— *The Architect.*

PRACTICAL NOTES.

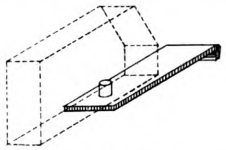
[PUBLISHERS' ANNOUNCEMENT.—Under this heading we shall mention improvements in connection with brick-building, but in no case will any paid for matter be allowed in these columns, for the purpose of this department is not advertising. No matter appearing here is in any way, shape, or manner published as part of any advertising contract, verbal or written. The selection is made for the practical use of our subscribers. While in many cases articles are written upon data supplied by manufacturers, we are confident that these data are trustworthy.]

WALL ANCHORS.

In our last number we called attention to the Goetz system of anchorage and caps, illustrating the various modes of application. It will, we think, be of interest to our readers to continue the subject by a brief discussion of the Duvinage system, known as the Standard Anchor and Post Cap. The anchor is of principal importance. It is designed, as is the Goetz anchor, to do away with the danger of falling joists wrecking the walls, and at the same time to form a tie, which is effected in this case by a projecting lug for which there must be an auger hole. The plates are made in several sizes, of both cast and wrought iron; and in the case of a party wall or partition, a double-ended plate, extending through the wall, is used.

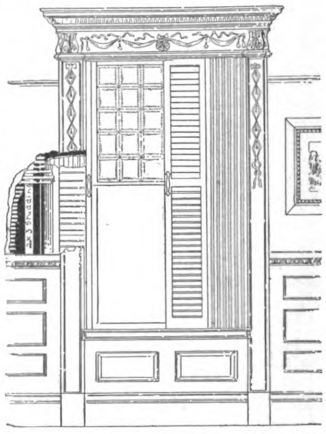


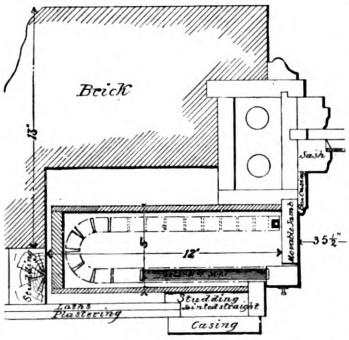
The plates are also made for iron and steel beams, and are an additional advantage in that they give a larger bearing surface. Certainly it has an advantage over the Goetz anchor in requiring less labor to prepare the joists, which need only half a dozen turns with an auger, as against two saw cuts and chiselling out. The cuts herewith given, supplied us by the inventor, will give clear enough ideas in general of the anchor. Further information as to price will be supplied by the manufacturers, P. Duvinage & Co., 371 Fulton Street, Brooklyn. The plates are sold also by dealers in builders' hardware. The Goetz-Mitchell anchor is manufactured in all parts of the country, by local foundries, upon a royalty. The address of the nearest foundry would probably be supplied by the general office, at New Albany, Ind. The matter of effective anchorage is of considerable importance, and we should like to have ideas from our readers.

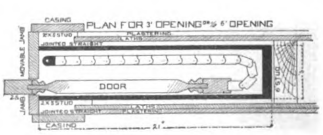


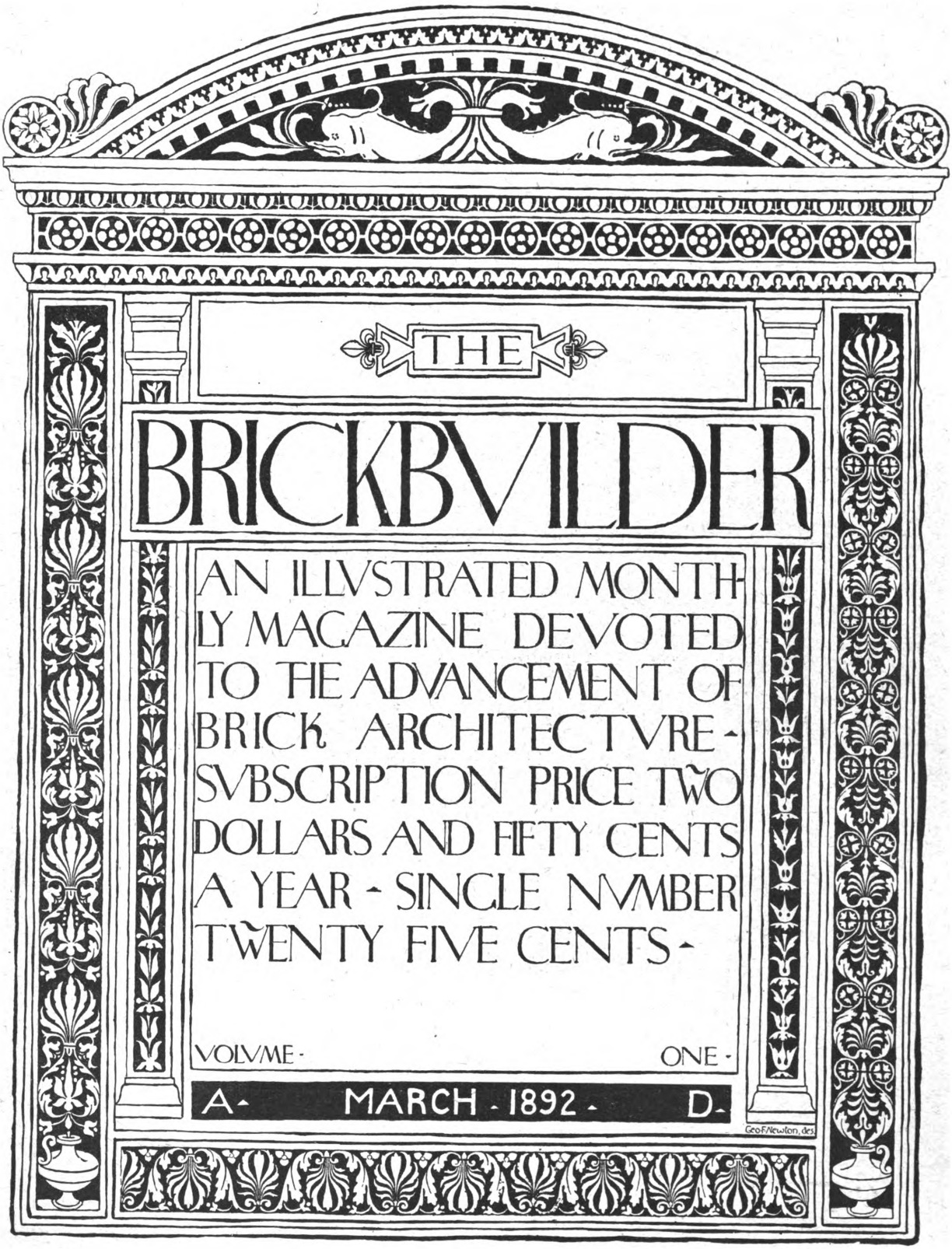
A NEW FOLDING BLIND.

The mention of this blind and the doors that work on the same principle, would hardly be in place here, were it not for the fact that many architects have found them desirable for use in brick buildings where the removal near the window opening of one course of bricks, gives room for a large blind. One way is here shown, but there are others that suggest themselves. Recently, the manufacturers brought to our notice a case where there was but sixteen inches of pier between windows, yet the blinds were put in by a little variation of the principle of closure on which they were constructed. They have also been found to adapt themselves perfectly to projecting bow windows which, in brick buildings, are so often constructed of copper, or galvanized iron. While carefully made and hung, they are so boxed as to be easily put in place by any carpenter. The catalogue shows various uses to which the Flexifold doors and blinds may be put, but it is a matter of regret that with so great an opportunity for artistic design and finish, as these offer, that the manufacturers should not have been more happy in the designs their catalogue contains. A recent sketch by Clarence Luce, of New York, published in some of their advertisements, shows that thoroughly artistic treatment is possible, when an artist studies the problem. The company has a branch office in the Boston Master Builders' Exchange, and information can be obtained there.









The Brickbuilder.

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THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF BRICK ARCHITECTURE.

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We remark with pleasure the appreciative notice of THE BRICKBUILDER which appears in *The Architectural Review* of March 14. It is encouraging to have the approval of a journal which is rapidly becoming the recognized authority in matters of architectural criticism; indeed the only journal in this country which attempts anything like that serious, systematic, and critical review of current architecture, which is so much needed. Whether or no it be true that in multitude of counsellors there is safety, it is certain that when counsellors agree they carry the greater influence, and we are glad to gain for our position that weight and cogency which come from the concurrence of another and so good an authority. The remarks of the *Review* emphasize and supplement so well the views we have expressed in these columns, and which we shall from time to time reiterate as occasion may serve, that we venture to quote them entire: —

"THE BRICKBUILDER has published an excellent initial number, with a series of plates that cannot fail to be useful. There is no field which has been so neglected as that of obtaining good results in brick architecture; and now that the range of color of bricks is practically unlimited, it is possible to obtain results that will compare with the best of the Italian and Spanish brickwork. We are glad to see that THE BRICKBUILDER advocates the adoption of a pressed brick that will bond with the common brick. At present it is not an easy matter to even build a common brick wall with pressed brick quoins. There is one thing which thus far has coarsened and vulgarized brick buildings in which no terra-cotta or moulded brick has been used, and that is that the smallest brick were not sufficiently small or of varied enough shapes to make refined label mouldings, string courses, etc. It will be seen, by a comparison of the plates of Boston and of Italian cornices, that while the former have units of one size only to combine, the latter have units of several sizes and of several shapes. As a result the Boston cornices are comparatively commonplace, crude, and large in scale, while the Italian ones are full of interest and refined. In going over the catalogues of moulded brick in nearly every case, no matter how varied the profiles may be, the size of the bricks is the same throughout. Designing in such a limited scale of parts is therefore considerably hampered; and as in mosaic, there are larger and smaller pieces, so in brick cornices, belts, etc., it would be a positive advantage to have a choice of sizes of units. If, then, there were made small brick, square, triangular, circular, of dimensions which would be divisors of the usual brick for facing the walls, the possibilities of rich design in brickwork would be increased to a practically infinite degree. Such choice of material would not only be acceptable to architects, but would stimulate the ingenuity of the mason (for ingenuity enters largely into the design of a brick cornice), and anything that aids in developing interest or enthusiasm in the workman cannot be too greatly desired. Mr. Warren's 'Neglected Considerations in Regard to Brick Architecture' is most excellent. He states the case thoroughly and to the point. We only wish that all architects would insist upon the considerations he mentions. It is a mere matter of prejudice, a desire to avoid what has seemed acknowledged cheapness, that have made the public object to common brick. In fact, there are no pressed brick buildings older than one hundred years, and why the same people who admire the brick buildings of Europe should fail to employ the same material here is a subject for inquiry."

We agree entirely with the statement that there is great need of a variety of sizes and shapes of brick, especially for label mouldings, string courses, etc., and this not only in moulded, but also in plain brick; nor does this militate in any way against the adoption of a standard size. As the *Review* suggests, the dimensions of the smaller sizes should be divisors of the standard size bricks. The brickmakers might with advantage give us also moulded brick of the so-called Pompeiian or Roman size. Such a series of mouldings would be a valuable addition to those already at command. The conclusions which the *Review* draws from a comparison of the Boston and Italian cornices published in our first number are, perhaps, more striking in the comparison of windows shown in our last and also in the present number, though in these instances the results in the modern case are not so disastrous. When we see the old Italian window and its nearest modern equivalent, according to the brick catalogues, side by side, the most obvious fact brought out by the comparison is the equality in size of all the parts in the modern example, and the great variety in size in the ancient one. This is noticeable both in the comparative designs which we publish in this number and which we gave in the last, and it is obvious that the ancient examples gain from this very cause. But we do not believe that the coarseness and vulgarity due to want of proper scales in simple modern brickwork have been due entirely to a want of variety in the material at hand. Had our designers felt the want as they should, they would have found some way out of the difficulty.

For instance, tiles of varying thickness are generally easily obtainable, and, by using one or more projecting courses of tiles together, a great variety of strings and label mouldings of different thicknesses can be produced at little expense, and even very effective dentil or billet courses. The use of plain red tile in connection with brick can indeed be made to produce a much greater variety of treatment than has yet been attempted. We will mention only one other instance; namely, the use of plain tile, alternately flat in the wall and on edge, to produce a series of sunk panels separated by delicate arrises formed by the edges of the tile projecting from the wall. These are suggestions for the simplest and least expensive treatment, and we are inclined to give especial attention to the simple and inexpensive structures, as it is precisely to these that so little attention has been paid hitherto, when yet a simple and inexpensive building is capable of as much *design* as a more elaborate and costly affair, and if well treated may be really more beautiful than its more pretentious neighbor. Surely anything that is worth doing at all is worth doing well,

and inasmuch as the cheaper buildings must always be in the majority, must always therefore be of the greatest influence in giving its character to any place, it is always worth while for the designer to bestow his best efforts upon them. And this does not mean that they are to be cut up into a multitude of parts or made to strive for what they cannot attain. Let an inexpensive building, above all things, be modest; let it be severely simple, even to baldness if need be; but let its parts be carefully proportioned in relation to each other; let its window openings be grouped as agreeably as may be and be rightly proportioned to the wall-space; let its detail be in scale with the building — neither too coarse nor too fine — and concentrate such modest ornamentation as it may have around the doorway or in the cornice; and, finally, let it be the simple and straightforward expression of its practical requirements, and the result cannot fail to be charming. These elements of beauty the very simplest and most utilitarian of buildings may have and ought to have.

Tile making in this country has certainly not as yet been as successful as we hope it may become, nor need tile roofs be as expensive as at present they are. When the tile makers can furnish a good tile at a moderate price, we do not question that the architects will be quick to adopt it.

It is undoubted that the tile roof is in appearance the most beautiful of all roof coverings, and that it is capable of more artistic treatment than it has received as yet in this country. We have but to look at drawings of ancient Greek or Japanese tile roofs to feel assured of this fact. It is encouraging, however, to notice signs of great improvement in this direction. Among the tiles most recently put on the market, we have seen with pleasure those made by the Celadon Terra-Cotta Co., of Alfred Centre, N. Y., as being one of the most beautiful roof coverings we know, and which should, we think, prove to be a durable and water-tight tile, even in our severe climate. The care bestowed upon the design of the eaves-tiles and hip-rolls, some of which show evidence of the study of Japanese originals, is especially to be commended. But in cost, these tiles are no exception to the expensiveness of our American tiles.

In several quarters there exists a prejudice against brickwork, which one encounters once in a while when least expected, a prejudice often as obstinate as it is unfounded. Because brickwork happens to be comparatively inexpensive, it is by some ignorantly supposed to be deprived of all other virtues. Being cheap it is assumed that it cannot be beautiful, when yet it is as capable of beautiful treatment as any other material, and is as worthy of excellent design. Then, strangely enough, it is maintained that it is not durable, when yet it is the most indestructible of all building materials. We have heard it stoutly asserted, especially with regard to moulded brick, that it lacked durability, and this as if moulded brick were a new material, a recent fad. But moulded brick is no experiment; nor need one go to the walls of Babylon, or to the buildings of four, five, or six hundred years ago in England, Italy, or the Netherlands, in order to be sure of the permanence of moulded brick. The Eastern States of our own country are not without fine examples of a simple and modest but excellent brick architecture, dating back from one to two hundred years, in which moulded brick is frequently employed. Such are the older buildings of Harvard College, the Old South Church in Boston, the old Swedes Church and Christ Church in Philadelphia, besides numbers of mansions about Philadelphia and all through Virginia, and in the Dutch settlements of New York and New Jersey. The brick used in these buildings is, of course, handmade, and most of it was imported from England, or, in the case of the Dutch settlements, from Holland. An examination of these buildings would quickly set at rest any question as to the durability of brickwork.

But a great deal of bad brickwork has been put up of recent years, and to this, doubtless, is in large measure due the prejudice of which we have spoken. There being in brickwork so many more joints than in stone masonry, the quality of the mortar in brickwork is of far greater importance. If the mortar is poor and disintegrates, and the building crumbles into the small parts of which it is made up, it becomes of little consequence that these small parts are themselves of such a durable nature. The best cement mortar is none too good for brickwork that is intended to be permanent, especially in this climate, and it is to the truest interests of the brick masons as well as of the architects, to see to it that the best mortar is always employed. It is especially important that the projecting courses are laid in cement mortar. Another point of importance to the durability of brick walls is that they should be properly protected at the top with an overhanging course with a drip either of salt-glazed terra-cotta, or stone, or even a mere board covered with tin. These are elementary points, but they are only too often neglected.

It is true, of course, also, that there are, especially in some sections of the country, too many bricks of a very poor quality, soft and therefore not durable. Too much care cannot be exercised by builders in selecting brick. If we are to have a good brick architecture, if brickbuilding is to become what it may become, the first thing is to have brick of good quality, and the next to see to it that the mortar and the workmanship are of the best. Without these brickbuilding will rapidly come into disrepute, and the finest designing will be futile. It is the too frequent want of these that has given color to the prejudices to which we have referred.

There is another moral we are inclined to draw, suggested by the studies we were obliged to make in preparing for the comparative plates we are publishing of features of ancient brick architecture, with their possible modern equivalents, and that is with regard to the character of the mouldings themselves, which our plates are on too small a scale to clearly show, but which are none the less important in the effect of the executed work. It would be just as cheap to make good mouldings as bad ones, refined mouldings as vulgar ones, interesting mouldings as stupid ones, once the original models and forms were made. And yet an examination of most of the brickmakers' catalogues reveals the fact that they have been copying from each other, and perpetuating a series of the poorest and most commonplace mouldings it is possible to imagine, mouldings which had their origin in this country at a time when architectural design with us was, perhaps, at its lowest ebb. Except in the case of simple beads or quarter rounds and quarter hollows, geometrical forms in which it was hardly possible to go astray, the mouldings are in most of the catalogues coarse in feeling, poor in line, and almost hopelessly vulgar, and, what is remarkable, the same bad mouldings appear in catalogue after catalogue, copied apparently from some unfortunate original.

The want of refinement is of course most apparent in the ornamented members. The egg and dart mouldings, for instance, are in most catalogues quite without any beauty. Why cannot the brickmakers throw away their old moulds and get really good designers to draw them some really good mouldings and some really good modellers to model them? It would cost a little at the outset (especially as good designers and modellers are paid more than poor ones), but it would pay in the long run. There are one or two companies, indeed, which stand head and shoulders above the rest in this respect, and, provided the quality of their brick is as good, they cannot fail in the end to get the best class of trade. We hope to see the

example of these companies followed, and would suggest to the more enterprising moulded-brick companies that they might with advantage institute a competition with adequate prizes and competent judges for the best series of brick mouldings of given sizes. THE BRICKBUILDER would be glad to aid any such enterprise in any way in its power. We have all the mouldings of the past to copy from or to use as suggestion, and there is no reason why brick mouldings to-day should not be made as beautiful as ever they were. The brickmakers have done wonders of late in giving us a most beautiful series of colors in brick, but have in most cases neglected to make any improvements in their mouldings. Let them look to their catalogues!

In the *American Architect* for April 23, Prof. Morse concludes his instructive series of articles "on the older forms of terra-cotta roofing tiles." The articles reveal the fact that the vastly larger majority of the civilized human race live under tile roofs. In the last article is an interesting map showing the distribution of tiles of different forms throughout Europe. Prof. Morse classifies the tiles of the world according to their forms, and gives brief descriptions of the forms of tile that have been in use in different countries. The ancient Greeks and the Japanese stand out pre-eminent as the peoples that have made the most artistic use of tile roof coverings, and who have bestowed most thought upon the treatment of the roof. And as Prof. Morse points out, especially in the case of a tiled roof in Nagasaki and the roof of the temple of Hera at Olympia, there are striking resemblances between these roofs, "separated by nearly three thousand years in time and thousands of miles in space." Prof. Morse regards the ancient Greek tiled roof as originally derived from the far East. The paper is full of suggestions for tile makers. We would call especial attention to the following remarks on the curious infrequency of tile roofs in the United States: —

"We have seen in the course of this paper that in all parts of the world outside of savage areas and under all climatic conditions people shelter themselves beneath roofs covered with terra-cotta tiles. With this wide dispersion of roofing-tiles, however, there still remains a territory extending from the Atlantic to the Pacific, embracing Canada and the United States, which is virtually destitute of this ancient form of roof-covering. It is a curious fact that a material so cheap, durable, and picturesque, and one so widely distributed throughout the world, should not have effected a lodgment in this country. It seems all the more singular when it is considered that the early colonists — Spanish, Dutch, French, English, German — all came from tile-using countries. This curious condition of things can only be accounted for by the fact that at the outset wood was so much cheaper than any kind of baked clay that it was used in the form of clapboards and shingles to the exclusion of other material, and thus the habit finally became ingrained."

"Within recent years pantiles and flat tiles have been manufactured and used in this country. Their use has been mainly confined to large structures, not for the sake of economy or utility, but for architectural effect. Such roofs have been far more expensive than similar ones in Europe, and judging from the trouble many of these roofs have given, it is quite evident either that the right kind of tile has not been made or that it has not been properly applied to the roof. From the frequent breaking of the tiles it has been supposed that our climate, with its rigorous changes, was the cause of this. I have observed, however, in Europe, that tiled roofs are quite as common in regions north of the line of frost and snow as below that line. In England the effect of frost is spoken of as being unfavorable to tiled roofs. Despite these drawbacks, it would seem that the terra-cotta tile, when properly made and adjusted, is one of the cheapest and most durable of roof-coverings, as it is certainly one of the oldest and widest distributed."

"Acting as a non-conductor, the upper portion of the house is warmer in winter and cooler in summer. Slate roofs absorb and transmit a good deal of heat. Shingle roofs are a menace in times of conflagration. With the best tile clays in the world and an abundance of the rude labor usually employed in tile-making, there is no reason why roofing-tiles should not come into common use in this country, as they have in all other parts of the world."

The *Thonindustrie-Zeitung* is quoted by the *American Architect* as stating that where the efflorescence on bricks is caused by lime in the clay of which they are made, it can be prevented by dipping the bricks in dilute hydrochloric acid just before burning.

"If the clay contains much lime the acid should be weak; if the proportion of lime is small, it may be stronger, the point being to keep the acid so dilute as not to injure the bricks by a rapid disengagement of bubbles of carbonic acid from the clay. With the average clay, a mixture of one part commercial hydrochloric acid with forty of water answers well. Forty quarts of water are put into a cask, and one quart of acid added. This will give acid enough for dipping five hundred bricks. The bricks, when thoroughly dried in the air and ready for burning, are dipped for a second in the cask of acid, and then dried again and burned in the usual manner. After five hundred bricks have been dipped the liquid will be exhausted, and a fresh solution must be prepared. The bricks so dipped burn with a clear, even color, very suitable for face-bricks. In Germany, the operation adds only twelve cents per thousand to the cost of the bricks."

It is curious to observe that while the *Thonindustrie-Zeitung* says that the efflorescence is generally due to lime in the clay, Prof. Baker in his work on "Masonry Construction" states that it "generally originates with the mortar." It is probably as often due to the one cause as to the other. It is at any rate so often due to the mortar that treatment of the bricks before burning alone will not often be sufficient to prevent it. Prof. Baker recommends the use of Sylvester's method of repelling moisture from the surface of the walls by applying alum and soap washes alternately on the outside of the wall. Water absorbed by the wall from the mortar or during rain dissolves the salts contained in the brick or mortar, and on evaporating, deposits them as a white efflorescence on the surface. If the wall, by Sylvester's or any other method, is made impervious to water, this desposit is prevented. Prof. Baker also recommends as cheaper than Sylvester's washes, making the mortar impervious to water, by adding one per cent by weight of powdered alum to the dry cement and sand, and thoroughly mixing, and dissolving about one per cent of any potash soap in the water used in mixing the mortar. This method can also be used with lime mortar, though with less advantage. It of course prevents the efflorescence only in so far as this is due to absorption of water from the mortar, or from salts in the mortar. Other methods of preventing efflorescence by waterproofing walls are by Cabot's wash, and by Caffall's process of heating the walls and then coating them with a preparation of paraffine, which penetrates to the depth to which the heat has penetrated. Lately Mr. H. C. Standage, writing in *The Builder*, suggests that the proper remedy is the application of hydrochloric acid or a solution of common salt to the bricks, in order that by chemical action the salts which form the efflorescence may be converted into soluble salts and washed away by the rain. As the common salt is much cheaper than hydrochloric acid, he suggests that the bricks should be dipped in such solution before being laid, or well washed with it afterward. This whole subject, and the various methods of prevention and their comparative merits, need more thorough investigation than they have, so far as we know, as yet received.

A PLEA FOR PERFECTION IN BRICKWORK.

The perfect in building construction may be said to be reached when there is obtained a maximum of strength and durability at a minimum cost. To design a roof, a floor, or a wall that shall be strong enough to carry the load to be placed upon it, and strong enough to resist the thrusts that may be put upon it, is simple enough; the problem is to design in such a way that the portion of the structure is exactly strong enough and no stronger than is required; in other words, that there is no waste.

Having these facts in mind, it is easy to understand why there is so great a difference between carpentry in the United States and in England, and some parts of Europe. In this country timber is cheap and labor comparatively dear, while in England the reverse is true, and labor is cheap and timber comparatively dear. Adding the expense of freight to American timber used there, the cost will be somewhat more, while labor costs in round figures only about one half of what it does here. These facts affect and regulate construction to a very great extent, and what would at first sight appear to an English carpenter faulty and wasteful construction, is simply the result of a desire to save time; in other words, material is sacrificed for saving of labor.

These facts are equally true as far as brick construction is concerned, and it is doubtless due simply and only to the desire to save time that the imperfect, faulty, and altogether wasteful method of laying bricks in "running" or "American bond" has come into general practice. It has been suggested in these columns that the fact of face bricks being of a different size to those on the interior of the wall is responsible for the use of the bond, but the writer thinks that this does not by any means explain it all, although it may to some extent. There is no reason in the world why the back of a wall, whatever the sizes of face and back bricks may be, should be laid in running bond.

Now, in the construction of buildings as in other things, it is often profitable to closely and critically examine the methods followed elsewhere to ascertain whether they may not be adopted with advantage here. It is certain that no part of a building deserves perfection in construction, so to speak, so well as does brickwork, and this for the simple reason that no portion is less liable to decay. The best bricks, and this literally means bricks of the highest quality, are exceeded in durability by no known material used in the construction of buildings. Iron rusts; timber decays; stone perishes, and if it be limestone is destroyed by fire quicker than timber; but good brick resists the action of atmosphere, fire, and water, and lasts for ages. The very strength and durability of brick have been the cause of poor brickwork, paradoxical though it may seem.

To construct a brick wall that shall be as strong as possible from the materials at hand would appear to be eminently desirable, but a wall erected in running bond falls short of that by a good deal. That this is true is not difficult to understand. The system of construction violates the most important principle of bonding which is, that no two vertical joints shall come over one another. Suppose that there were no considerations of appearance, why not pile the bricks up one upon the other irrespective of bonding? "Oh," the bricklayer will tell you, "we must get bond,"—he must interlap the bricks to get bond,—to get strength on the face of the wall. Why not get bond through the breadth of the wall as well? That there is a necessity for it will not be denied, for the whole weight of the building rests on the inside portion of the wall, and it is of the utmost importance to distribute this weight through the thickness.

That which comes nearest to a perfect wall is that system of construction known as "English bond," in which the bricks are all laid headers, excepting at the face, in alternate courses, where they are laid stretchers. This system of construction produces a wall in which the fundamental principle of bonding is closely adhered to, and it will be found that, when it is faithfully carried out, no two mortar joints, in any part, come over one another. Flemish bond, although less perfect from a constructional point of view, is very considerably stronger than running or American bond, while its appearance is generally acknowledged to be very much superior.

Now, while the strength of a wall erected in English bond is very considerably stronger than one built in running bond, it is a fact to which due regard must be paid that the latter effects a saving of time. But while it is true that running bond can be built somewhat quicker than English, the writer claims that the advantage gained in this respect is so small as to be altogether inadequate to compensate for the great decrease in strength. It may be added, that, when he has urged architects to specify English and Flemish bond, he has been told that builders would refuse to construct them without an exorbitant increase of cost, being actually bound by the journeymen bricklayers to lay only the system of bonding they have been used to. This idea is doubtless exaggerated because no small proportion of working bricklayers are foreigners and are well acquainted with the correct methods of laying English and Flemish bonds.

But whatever bond is used in the construction of walls, there are certain other points of importance that are only too frequently overlooked. The first of these that may be mentioned is "damp courses." In Europe the use of damp courses is rendered compulsory by the building laws in most large cities. A damp course, if constructed of proper materials, is absolutely effectual in preventing the rising of moisture by capillary attraction from the earth and the consequent dampness of the walls.

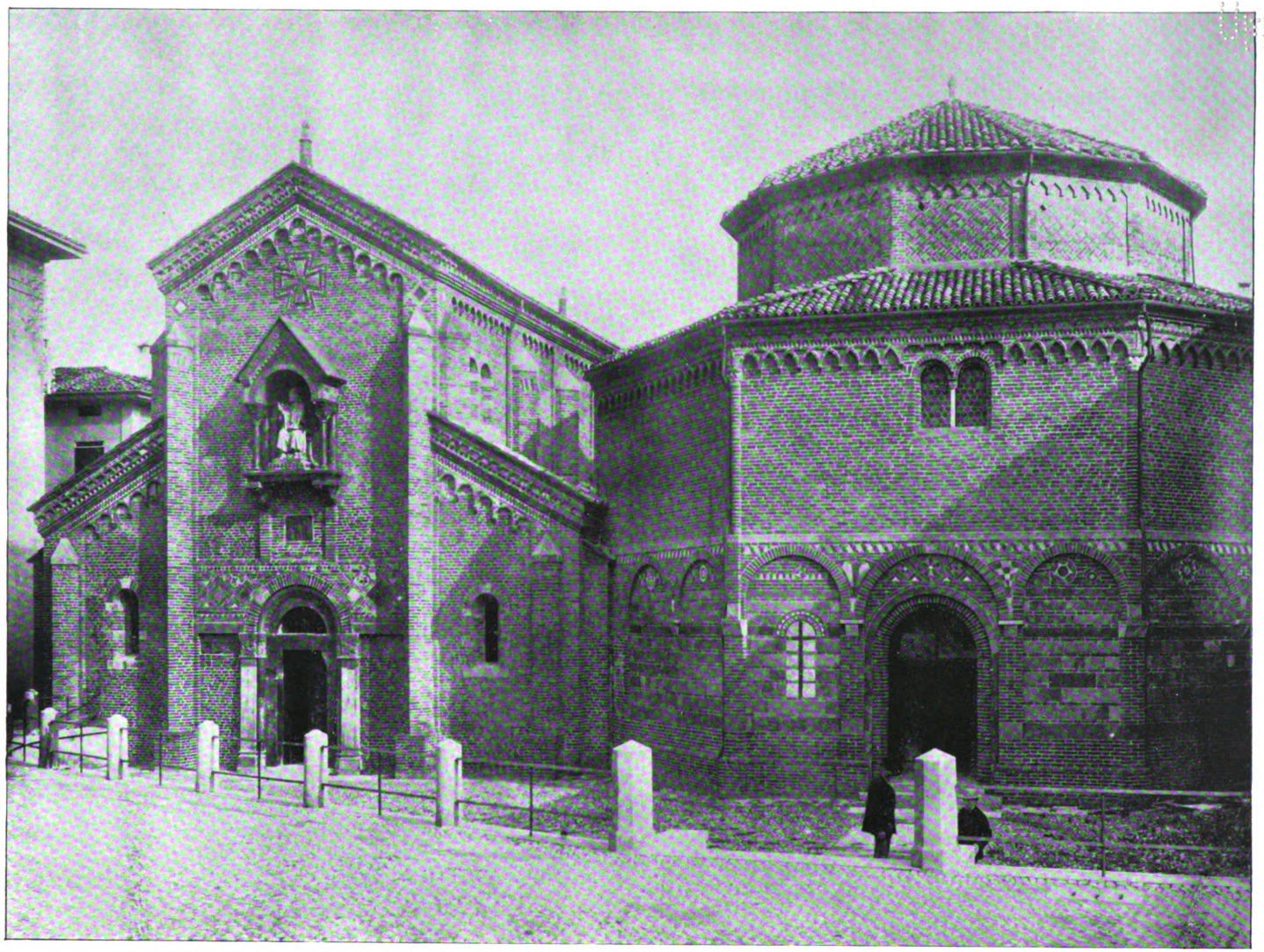
"How to cure damp walls" is a question that is propounded to the architects' and builders' journals very frequently by house owners and others who are suffering from this trouble, and who not infrequently state that they have tried the application of various kinds of paint to the surface of the walls with the only result of driving the moisture higher up the wall. In such cases an effectual remedy may be found in inserting damp courses throughout the wall, underpinning it as may be necessary, although, of course, the damp course should have been inserted when the wall was built.

A good damp course may be constructed of three layers of common roofing slates, laid in cement with the joints lapping, the edges of the slates projecting to about an inch or so beyond the side of the wall. The damp course, of whatever kind it is, should be put in just above the ground line. A layer of Portland cement (that is, cement mixed with water without the addition of sand) spread over the surface of the wall, to the thickness of three fourths of an inch, makes a very effective damp course, as does also a layer of bituminous asphalt laid in the same way. Sheet lead is also used and possesses the advantage of yielding somewhat to the inequalities of the brick or stone, and by that means distributing the weight more equally over the area. Damp courses may be constructed of other materials: in fact anything that is absolutely impervious to moisture and may be applied to the thicknesses of the walls is suitable.

While the fact that damp courses are very little used can but occasion surprise to those who have had an opportunity of having seen them in constant use, the fact that hollow or cavity walls are so little used is even more surprising. Brick buildings, when standing in isolated positions, may always be erected with advantage with a cavity wall, because any moisture passing through the outer casing cannot find its way into the interior of the building. Cavity walls are constructed of what are practically two walls, built side by side parallel and at a distance apart of about two inches, the two casings being closely tied together either by bricks, or by iron ties specially made for the purpose and inserted in every fourth course at a distance apart of about two feet six inches. The wall, from the foundation up to the ground line, is built solid, and on the top is formed a damp course upon which two cavities are built. The portion between the cavities thus forms a gutter and is constructed with a fall so as to allow any water that may find its way in to run down the drains with which the cavity is connected. Sheet lead or sheet zinc is inserted over all door and window openings. In the case of brick-and-a-half walls, which consists of one brick wall and a half brick wall, connected as described, it will be a subject for consideration as to whether a thicker or thinner casing should go on the outside. As a rule a thicker is preferred on the exterior, as it offers the greater resistance to the moisture finding its way in; but in any case it is well to observe that the floor and roofing timbers should always rest on the thicker casing.

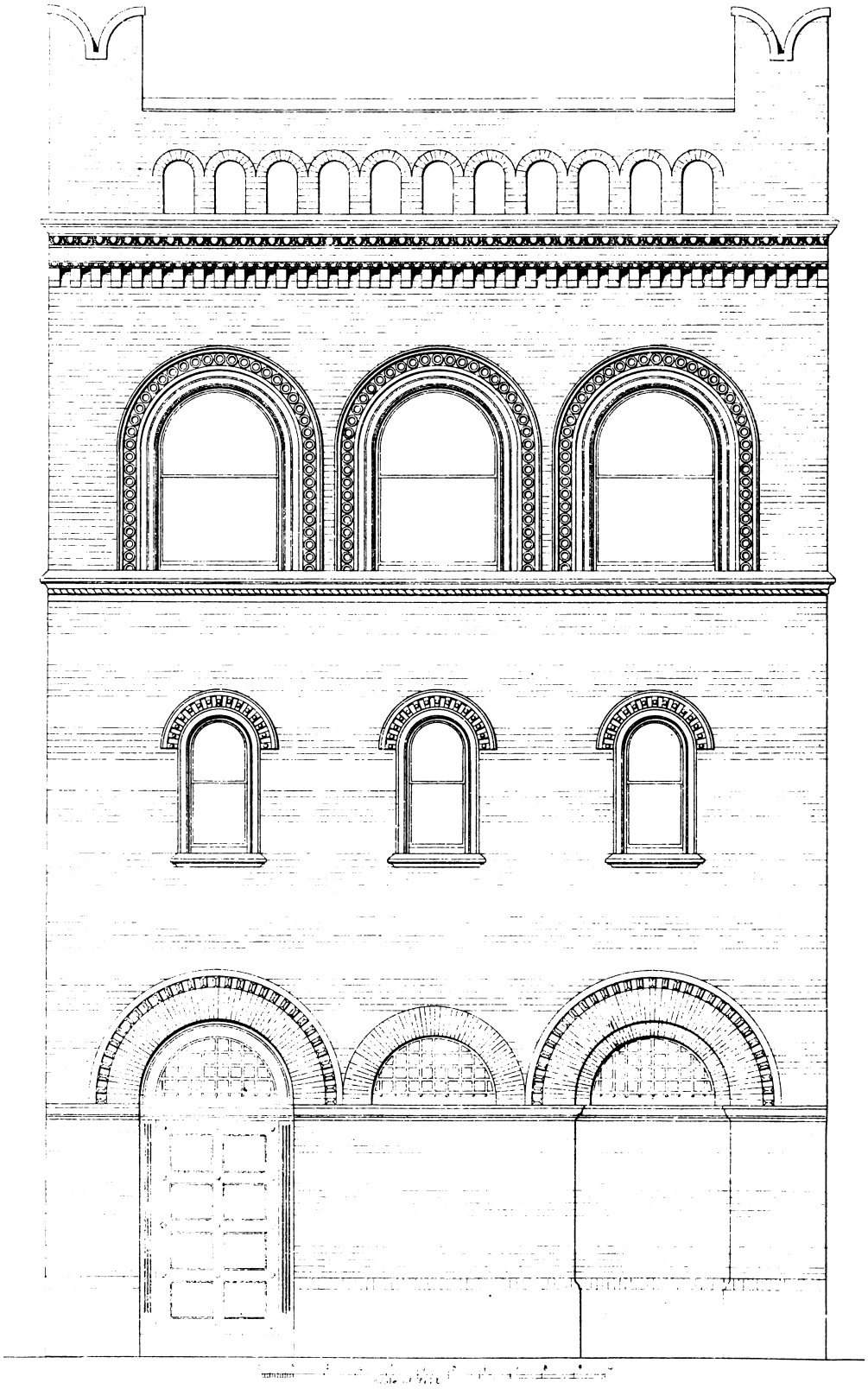
One of the most important advantages of hollow cavity walls is the important influence it has on the temperature of the house. The two inch space of air in the centre of the wall acts as a sort of a non-conductor, and the variations in the atmosphere are not felt to anything like so great a degree as they are when the walls are built solid. In other words, houses built with these walls are warmer in winter and cooler in summer.

Another point of construction that may be referred to is the hoop iron bond; this costs so little and adds so much to the strength of the brickwork that it is difficult to understand why its use has not become more general. Hoop iron used for this purpose is about an eighth of an inch thick, and one and a half inches broad. It is laid in every fourth course right along the wall, one row of hoop iron being



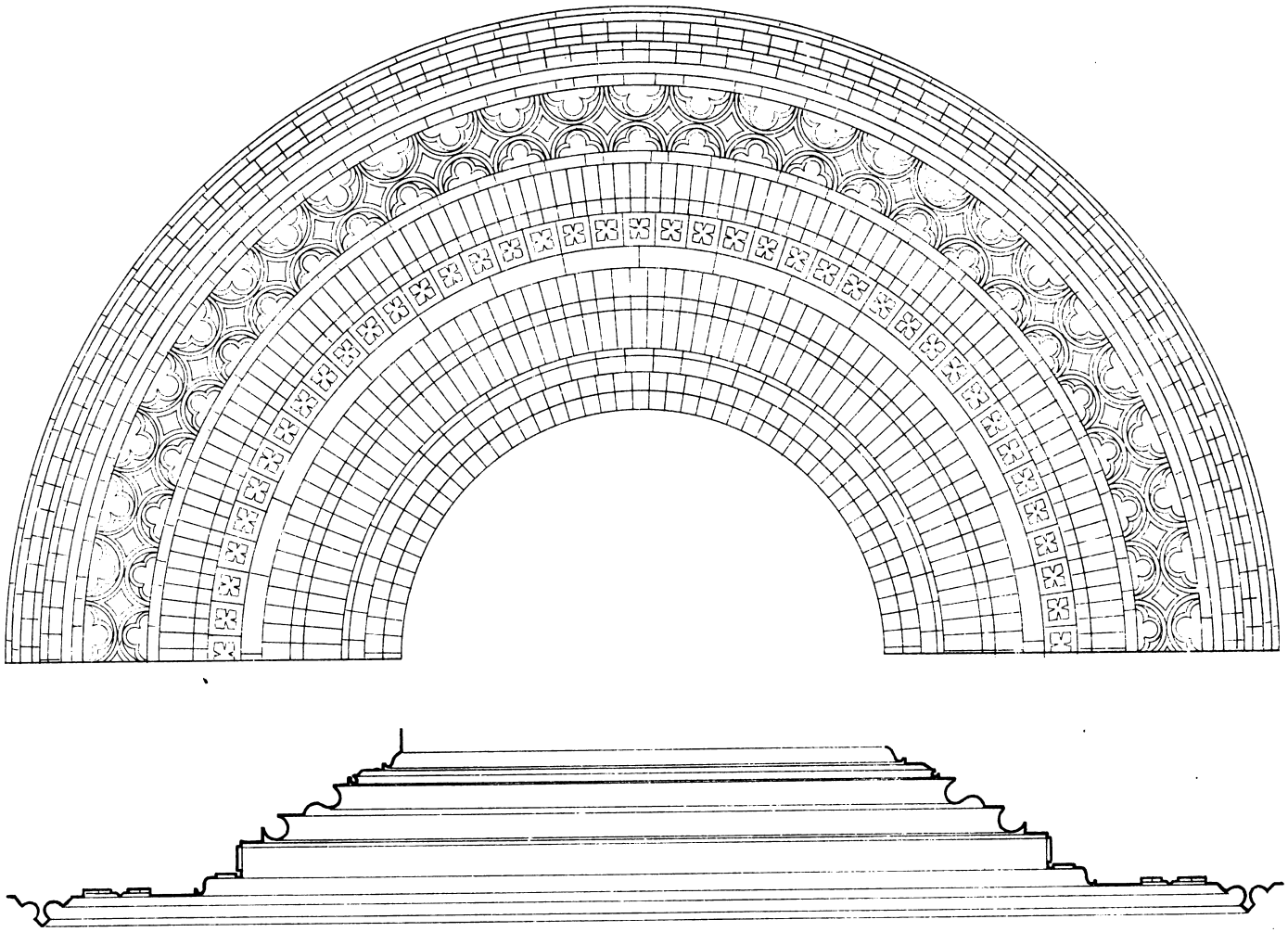
OLD BAPTISTRY OF S. STEFANO, BOLOGNA.

First of a Series of Photographs of Foreign Brickwork.

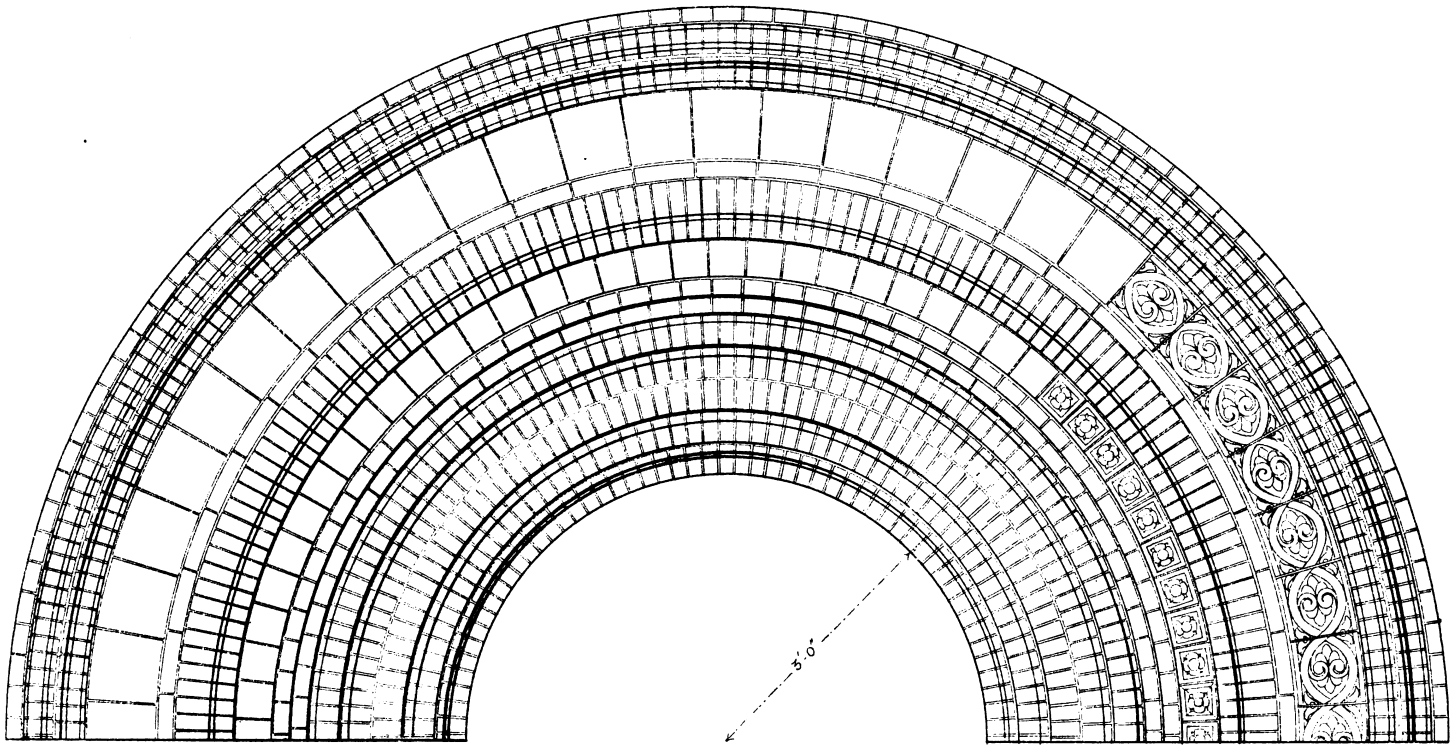


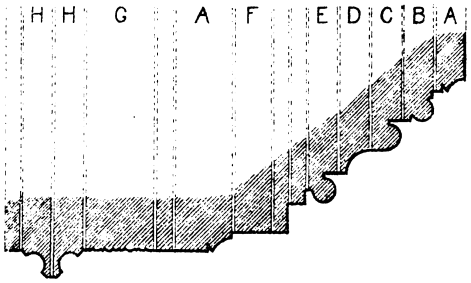
PROVIDENCE STREET ELEVATION, BAY STATE TRUST CO., BOSTON.

CARL FEHMER, ARCHITECT, BOSTON.



CIRCULAR WINDOW FROM BROLETTO AT BRESCIA.





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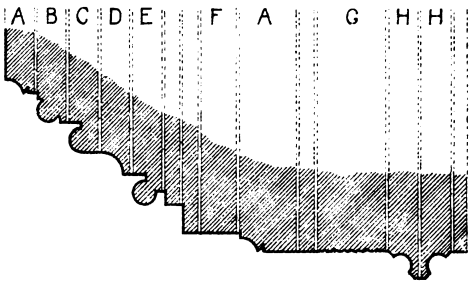

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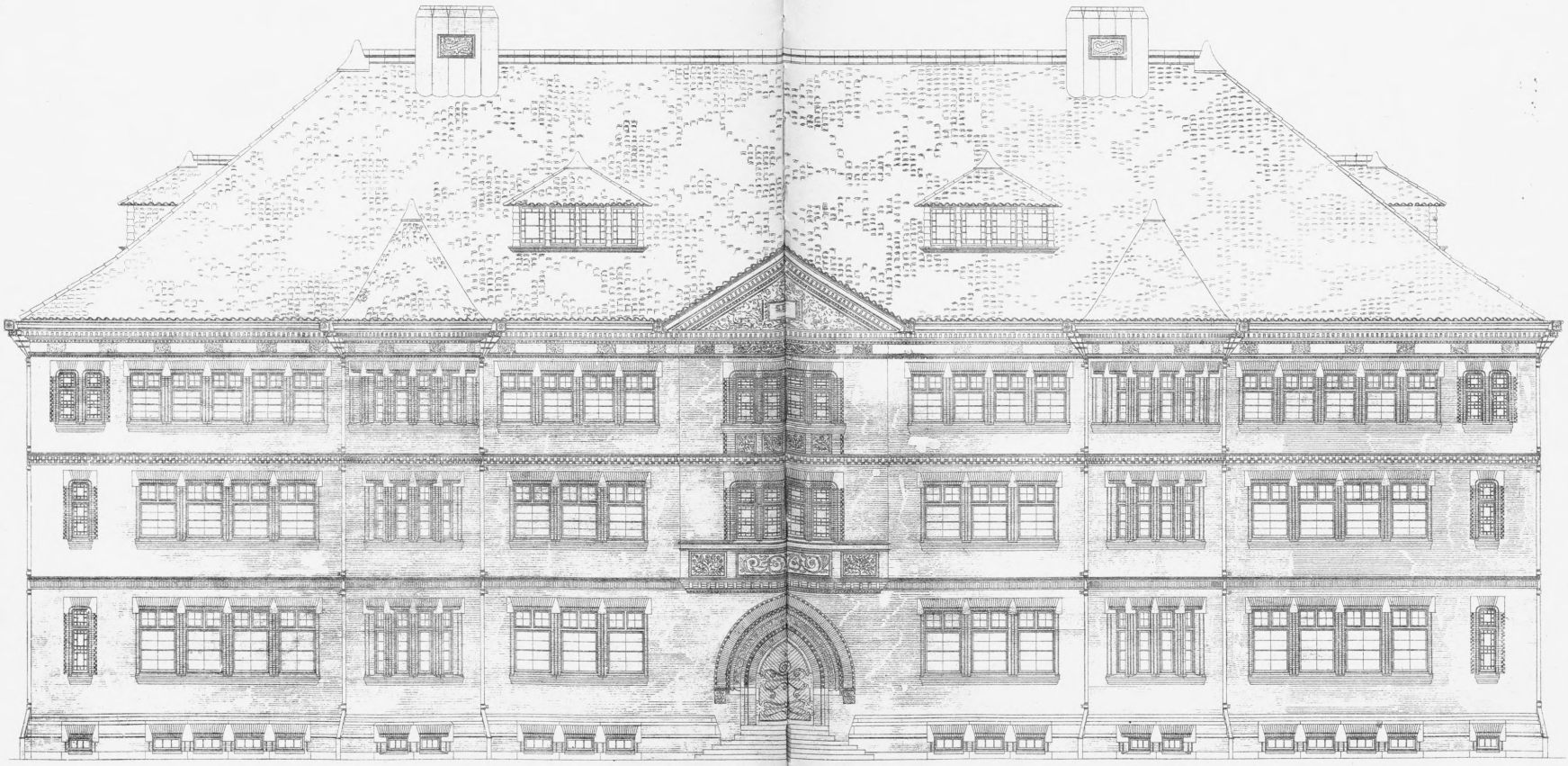

SEVER HALL, HARVARD UNIVERSITY.—WEST ELEVATION.

THE LATE H. H. RICHARDSON, ARCHITECT.

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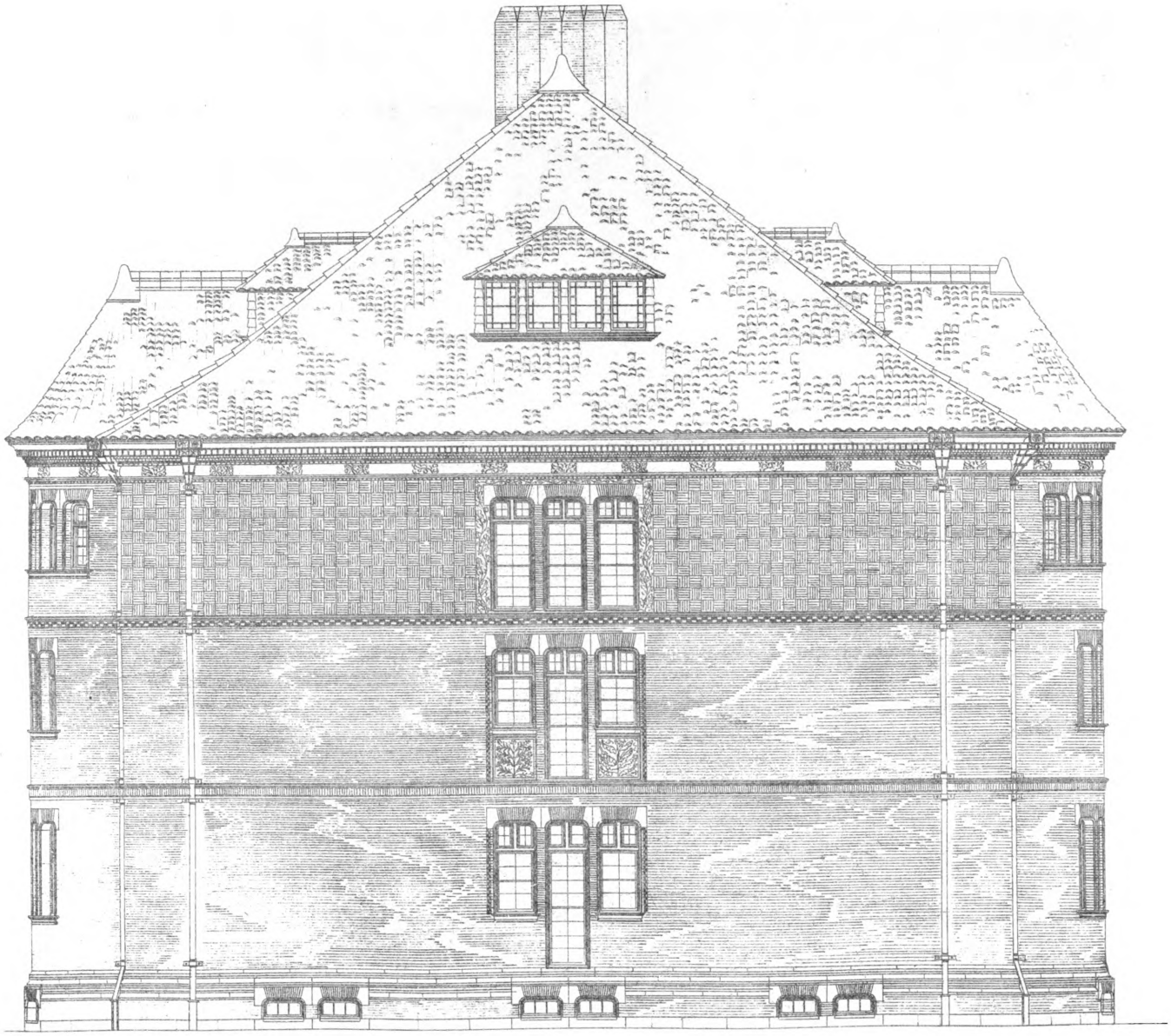

SEVER HALL, HARVARD UNIVERSITY.—SOUTH ELEVATION.

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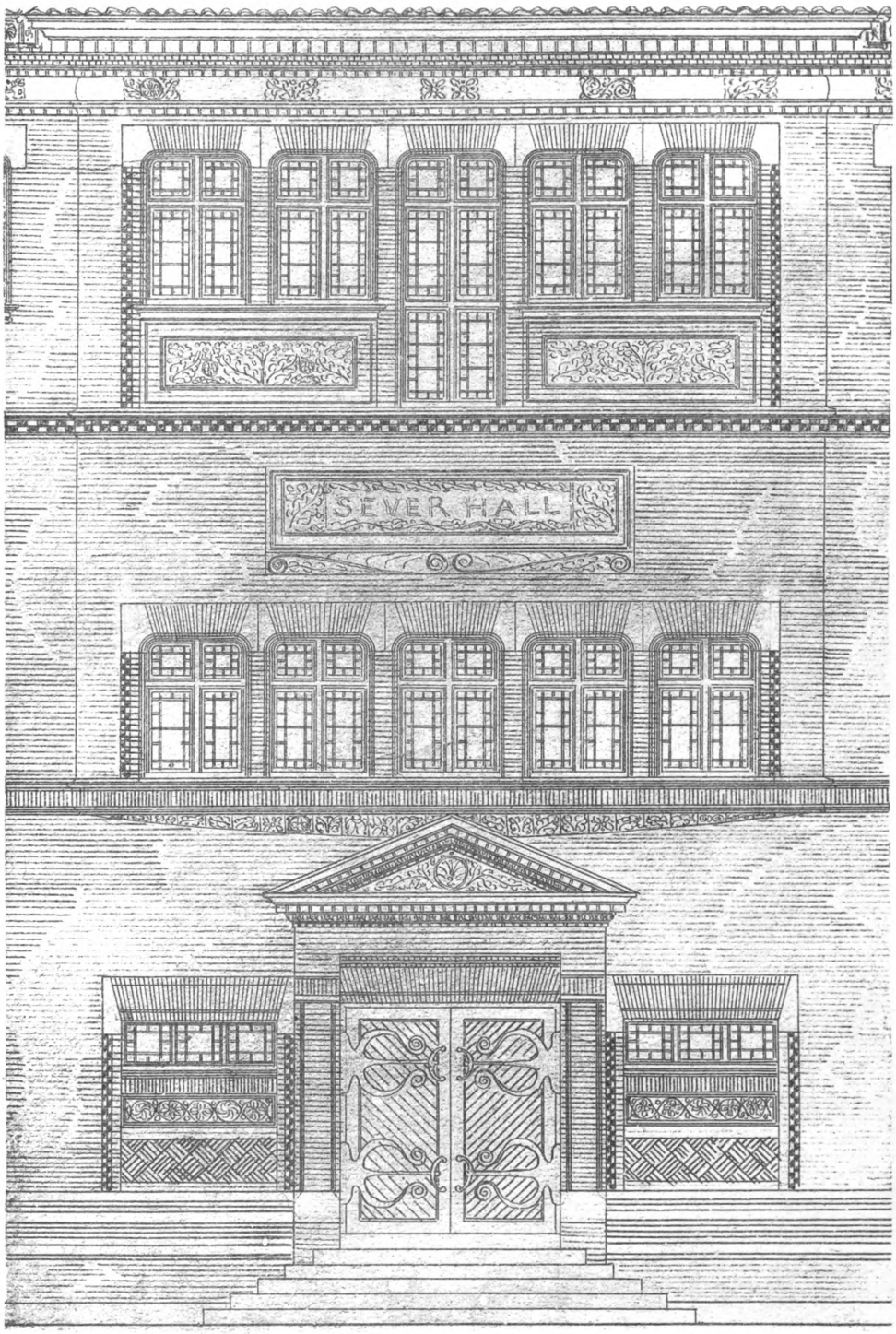

SEVER HALL, HARVARD UNIVERSITY.

CENTRAL FEATURE OF EAST ELEVATION.

THE LATE H. H. RICHARDSON, ARCHITECT.

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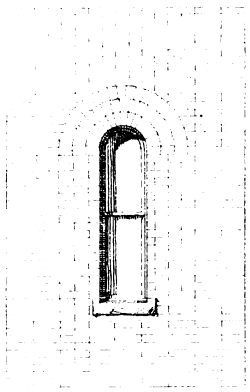

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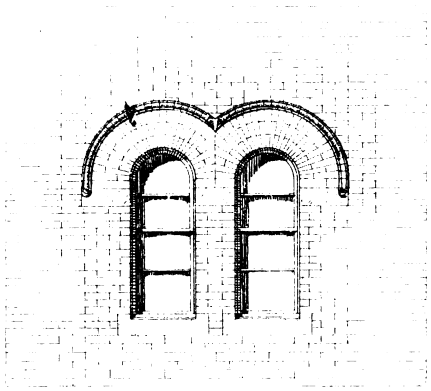

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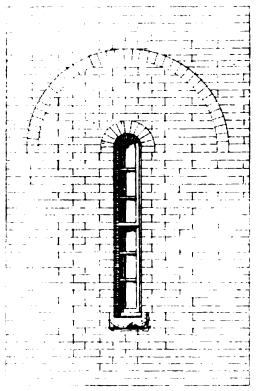

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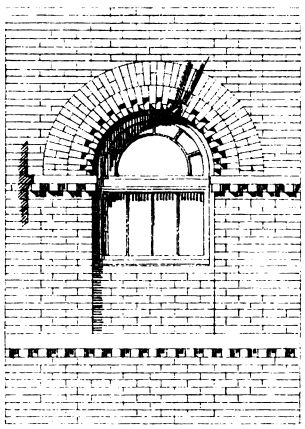
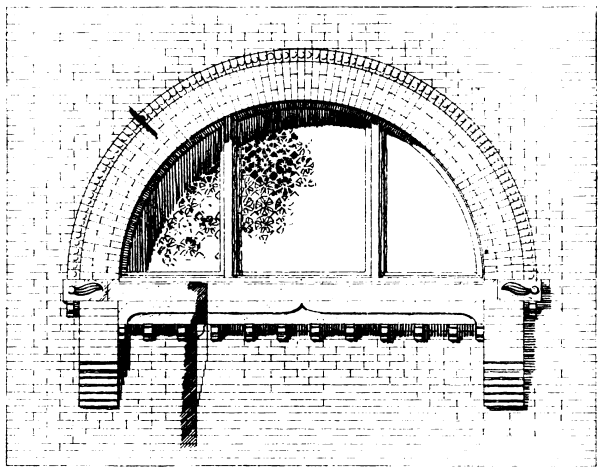
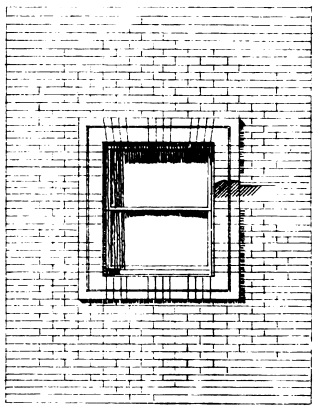


TUFTS & SOUTH STS.



232 W CHESTER PARK.



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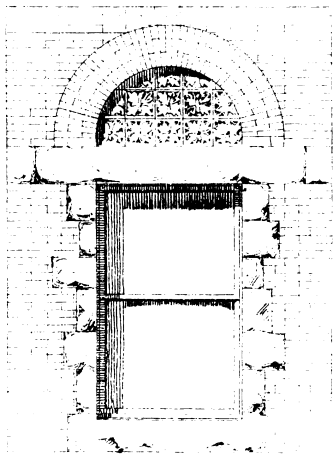
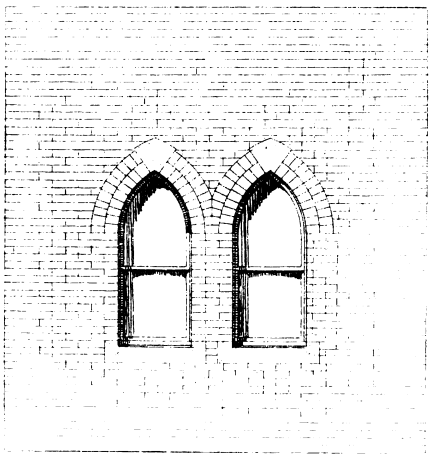


95 COLUMBUS AVE.



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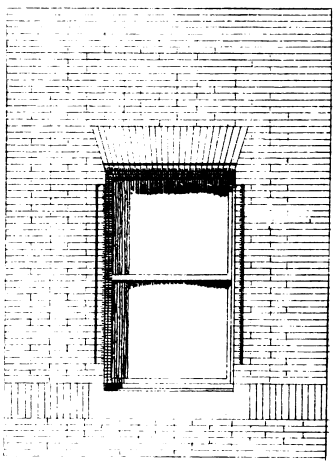


TRINITY PARSONAGE.

SOME BOSTON WINDOWS.

inserted for each half brick in the wall's thickness; the hoop iron is riveted at the angles. In order to prevent the iron from rusting, it is covered with tar or zinc. The edges are generally jagged with the object of getting a better grip of the mortar, and the hoop iron holds the wall together and assists in distributing the weight and is in every way desirable. Its cost is little, and the work it does great.

The writer, in preparing the above, has only referred to one or two of the more important directions in which it would appear that an improvement might be made in the construction of brickwork. Architects and builders have now better facilities for producing perfect brickwork than they ever had in the history of the world; and they should make it a matter of pride to see that the most perfect building material approaches as nearly as possible to perfection in construction. ARTHUR SEYMOUR JENNINGS.

COLORED GLAZES ON TERRA-COTTA.

Italians in general know little of the arts and how they were followed abroad after the fall of the Roman Empire, but seem to think that art of every kind had no existence anywhere but among themselves. No wonder, then, that Vasari, though wrongly, claims for Luca della Robbia the honor of being the inventor of applying colored glazes to burned clay, and the only artist in it at the time. The art of fixing by fire upon clay, sun-dried, if not already baked, the two sorts of glaze, the colorless and the colored, was well understood among the more cultivated nations in Europe, Asia, and Africa from remote antiquity. Spread with great niceness, either partially or entirely, over those admirably figured and beautifully shaped fictile vases which Greece wrought at home or by the hands of her colonists in Italy and Sicily, as well as upon that finer kind of hardware now generally known as Samian, do we observe a delicate, thin, colorless, transparent mineral glaze. A coarser sort of glazing was used by the Romans, who have bequeathed us such a mighty heap of potsherds on the banks of the Tiber as to merit its present name, Monte Testaccio. At a very early period the Egyptians ornamented many articles with a colored glazing. In the Middle Ages, as early as the eleventh century, upon those fine belfries to the churches at Rome, and built during that period, do we see let into the brickwork those curious large, round, concave pieces of hardware that glisten again as bright as ever, with their bright gum glaze, even now. Later, the art was brought to great perfection by the Saracens, and carried with them wherever they settled themselves around the basin and in the islands of the Mediterranean. Under these the South of Spain won for itself great reputation for its works in burned glazed clay, and more especially for its tiles, which, from being at first usually tinted with a bright purple glaze, bestowed their own specific name, Azulejos — just as Faïnza did to pottery in France—upon tiles of all sorts, and as a generic denomination. Those who have seen the beautiful Alhambra must recall to mind how several of its splendid halls are floored with these same tiles, still bright, and their walls in part skirted, after a very tasty pattern, with cubes of various colors, in the same material. But in Tuscany itself and not long before, Jacopo della Quercia had employed a glazing, a colorless glazing, it is true, but yet a glazing, upon burned clay. Here, in England, the glazing by fire of sun-dried clay tiles, especially for church decoration, was known and followed at an early period; and the specimens that have come down to us from the thirteenth century, and found at Chutsey, Castle Acre, Woodpery, and several of our other old churches and minsters, show not only a great elegance in design, but disclose the process used in making them. While yet the well-fined and kneaded clay was soft enough, the design was deeply struck into the face of the tile by a stamp, and the hollow thus struck filled up with white pipe clay. Over all this was floated a metallic yellow glaze that in the firing gave to the red a warm, full tone, and a rich, golden hue to the pattern done in white clay. In Germany the same art, after a simpler way, was practised. The "Acta Sanctorum," by the Bolandists, furnish us with the cenotaph raised in the old cathedral at Hamburg to the memory of Pope Benedict V., who died A. D. 965; and after the fashion of our English high tombs, its sides are skirted with glazed tiles, figured with sacred subjects and the persons of the apostles, the figures being white upon a green ground. Such a method was, therefore, very old and widely spread. While refusing, then, to recognize in Luca della Robbia the inventor of colored glazes as applied to burned clay, we must not, cannot rob him of the glory of being the first to use them with such new, such bold, such marvellous effect. — *The Architect.*

MEDIÆVAL BRICKWORK.

In the Middle Ages brick was used in place of stone in certain districts where stone was hard to get. These districts were widely separated, and though their architects knew what was generally current in architecture in their own neighborhood, it is most probable that they knew nothing of how other men who had to use bricks used them, and trusted in each case to their own good sense and skill to adapt what they knew of art to the material. The brick-building districts in the Middle Ages were mainly these: the North of Germany and the shores of the Baltic, Belgium, the district round Toulouse, the North of Italy and a large part of Spain, but especially the district between Zaragossa and Toledo. Now these districts are all far apart, but certain customs are found in all of them. The bricks are usually long and thin, made of well-tempered clay and hardly burnt, laid in thick beds of mortar, and frequently moulded with much care; in almost every respect, therefore, unlike the modern material. Everywhere, also, the habit of moulding bricks led to the frequent repetition of the ornamental features, and so to a really distinct style of art, quite unlike what would ever be thought of in the case of stonework. Up to a certain point, therefore, there was similarity of some kind. But in matters of detail, there were great differences. Look, for instance, at such a fundamental question as the mode of construction of an arch; in Italian examples it will be found that brick arches were constructed on a principle entirely unlike anything we ever see in England of the same period. The bricks are so disposed around the arch as to radiate, not from one centre, but from many; so that, instead of a wedge-shaped key in the point of the arch, we have a vertical joint, to which all the bricks accommodate themselves. Precisely the same peculiarity is seen in all the brickwork of Moorish architects, with the additional feature that the radiation of the joints began usually above the base of the arch. In German and English brickwork these features are never seen. So, again, in the formation of a cusp, the German, as a rule, moulded a whole cusp, and filled in his horizontal brickwork against it; whilst the Moor contrived in an entirely different fashion by building some of his cusps with horizontal courses cut to the required outline at the ends, and confining the arch bricks to the upper cusp. The Italian made his cusping by sometimes moulding his cusps, and sometimes cutting them, and sometimes again by an ingenious combination of cut bricks and stone. Analogous to these peculiarities is the constant use of the keystone to a pointed arch in Italian work, and the obvious repugnance to it in all work in the North of Europe, or again the practice, almost confined to Spain and Italy, of increasing the depth of arch voussoirs or arch bricks as they approach the centre of the arch, so that the soffit and back of the same arch are not concentric. In such cases we may accept any such variation as long as it is clearly not inconsistent in principle with the object of the work; and undoubtedly the more old examples are studied, the more these instances of variety will be found, which are not adduced as suggestions for copying, but as examples of the large and wide opening for original treatment of detail when it is done honestly and reasonably. In fact, the openings for such originality are just as great now as ever they were.

TERRA-COTTA IN BUILDING.

The artists of the Roman period made free use of clay wherever it came to hand more readily than stone. They learnt not only to use it in regular layers of brick, as we do, but to mould it to all the elegances of ornamental form, all the details of rich architraves, capitals, friezes, and engaged forms of sculpture. In some cases, as in the Amphitheatrum Castreuse and the temple of the god Rediculus, the material was wrought into form by the chisel. In modern Rome, as Hope pointed out in his "History of Architecture," very great use was made of brick until a period comparatively recent. Of the grand Farnese Palace begun by Bramante and finished by Michael Angelo the plain surfaces are of brick, though so exquisitely laid and of a texture so delicate as to be taken by the superficial observer for stone. On this side of the Alps clay has never been moulded into forms to rival those of Italy. Still, in the South of France, particularly at Toulouse, remarkable examples are to be seen. In the valley of the Elbe, where the same deficiency of stone compelled a resort to the use of brick, there was never any approach to the refined ingenuity of Northern Italy. At Lubeck, however, the cathedral and the church of St. Mary are respectable specimens of

the style. In the Marien Kirche, at Brandenburg, ornamentation is carried to excess. Hanover and other towns furnish picturesque examples, some of which may be seen in Mr. Fergusson's "History of Architecture." England at one time possessed a brick architecture of no mean merit. If less inventive in form or less rich in ornamentation than foreign models, it was at least simple, natural, and eminently fitted to the climate. Many a fine specimen of the old English grange, or of the more stately mansion of the Tudor and Stuart periods, still perpetuates a native type of architecture singularly suggestive of comfort. To the high fiscal duty and its ensuing restrictions is mainly due the degradation of brick in more modern time. The villanous imposture of stucco, aided by the contract system of building, completed the ruin of the style. The legal English brick became at once the least desirable and the most unsightly material that any country could show — the type of all that was bare, mean, ugly, and false. It was especially in the plains of Lombardy, where building stone is rare, that the great impulse was naturally given to the use of natural earths for building purposes. There, in edifices of the highest architectural importance, we find clay during a long period not only used for the purpose of solid construction, but also moulded into forms so exquisite as to take its place as a material of high value and dignity in art. So rich is Lombardy in early works of terra-cotta as to be fitly called by Hope "the great country of brick." Among the most ancient remains of the kind, M. Ottolini calls attention to the crypts of the church of Lenno, on the Lake of Como. There sundry relics are still extant of colossal statues in terra-cotta "of a close-grained and tough consistency," all of which the writer considers clearly to belong to the construction of Christianity. The use of terra-cotta followed the fortunes of successive schools of art in Italy. Both in sacred and secular architecture it enables us to trace the development of taste. The golden period of the art was marked by a wise sobriety and simple severity of ornament, with a scrupulous care to confine the material within its appropriate limits of style. In the hands of the gifted architects who flourished along with Lucca della Robbia, the pre-eminent modeller in terra-cotta, ceramic ornament entered into all that was purest and most noble in the arts of design. Crema, Chiaravelle, and, above all, Pavia were the headquarters of this graceful school. At Milan, in the Ospitale Maggiore and the Castiglione Palace, were exhibited the arabesques and medallions of the cinquecentro period. In the subsequent age, in the hands of the so-called imitators of Michael Angelo, art, overpassing the boundary line of truth, lapsed into exaggeration. The severe, modest, and delicate beauty of terra-cotta refusing to lend itself to the contortions and imitative tricks of the barocco or rococo style, the entire art soon fell into decay and eventual oblivion. — *The Architect.*

BRICKWORK IN THE TROPICS.

Bricks, when stones cannot be obtained, must of necessity be used for certain descriptions of work in the tropics. Great caution should be exercised in their selection, as it is found that all bricks made near the seaboard with brackish water are exceedingly susceptible to the weather, and moulder rapidly away when exposed. It is, therefore, advisable to make them at some distance from the coast, with fresh water, and, above all, to have them well and thoroughly burned, which, in these climates where fuel is generally most expensive, is most difficult to insure. Near to the seacoast in Brazil it is found necessary to protect all brickwork with plaster, which certainly serves its purpose exceedingly well. In the interior of the country well-burnt bricks may stand for a few years, but ultimately it will be necessary to plaster them, or to give them a thick coat of whitewash from time to time. Tar, over a coat of whitewash, has been used with considerable success for the protection of brick buildings and other works of this material; and in localities where it would not be considered unsightly, it is certainly preferable in buildings on the side from which the prevailing winds and rains set in during the wet season, as it not only throws off the moisture on the outside quicker, but tends to keep the interior of the building freer from moisture than any other outer protection. Of two samples of brick taken from the same wall, built in 1790, in Recife, although not in any way protected by plaster or lime whitewash, one appears to be quite perfect, while the other is rapidly decaying, and shows the necessity of outward protection as a general rule, owing to the all but impossibility of obtaining in large quantities thoroughly well-burnt bricks.— *The Architect.*

EGYPTIAN CONICAL BRICKS.

In the British Museum are certain conical bricks of baked red terra-cotta, internally black, but red on the exterior, in length about nine inches and three inches diameter at the base, on which are stamped in relief hieroglyphs the names and titles of a deceased, to whom they are said to be dedicated. They are found about the tombs of Thebes, especially those of the Drah Abu'l Neggah. Their use is unknown, but various opinions have been formed on the subject. As they often exhibit a red or white color at the base, it has been supposed that they were used as stamps, or, as they increase in numbers in the ground as the entrance of each tomb is approached, it has also been supposed that they were employed to mark the sepulchre itself and the adjacent ground which belonged to it. So close to one another, indeed, are the sepulchres of the Drah Abu'l Neggah, that these cones appear to have been almost unnecessary. It is, however, possible that they may have been used for some architectural construction, like the smaller cones of yellow terra-cotta used in the walls of Warka, worked in an ornamental pattern of brickwork. Commencing with the eleventh dynasty, and continuing to be used in great numbers till the close of the eighteenth dynasty, they became rarer after the age of Rameses, and their use almost discontinued at the time of the twenty-sixth dynasty, later than which none are found. Representations are very rare upon them, inscriptions in horizontal or perpendicular lines being chiefly employed. Rectangular and other bricks are found stamped in the same manner. These are so rare that the use of kiln-baked bricks prior to the Roman period of the first century A. D. has been denied. These bricks may have been used as trial-pieces of the stamps of the cone.

A movement of some importance to the young architects and draughtsmen of Pennsylvania has just been started by the School of Architecture of the University of Pennsylvania. The idea is to found a travelling scholarship in architecture, which will give to one promising draughtsman every year the advantage of a twelve-month of travel and study in Europe. Any draughtsman resident in Pennsylvania will be allowed to compete, and it is expected that the first examination will be held, and the first man sent abroad, next spring. To give the scholarship a solid foundation $20,000 will be necessary, yielding an annual income of $1,000. A good start has already been made towards the securing of this money. The architects of Philadelphia have given the plan their hearty indorsement, and it is hoped that the co-operation of the profession throughout the State may also be secured.

In order to excite public interest in the object and to aid in raising the necessary endowment fund, an exhibition of the drawings made in competition for the Rotch, McKim, and Columbia College scholarships is to be held at the Pennsylvania Academy of Fine Arts, together with some of the work of scholars while abroad. Such an exhibition should be of the greatest interest, and should aid materially in increasing the endowment fund, which is to be raised by subscription. The rapid increase in the number of these scholarships since the Rotch scholarship was founded in Boston in 1884 is a most encouraging sign, and must have great influence on the future progress of our architecture.

Under a new law passed at Albany the various building bureaus of New York City are to be united in a Building Department. The mayor has given his support to the plan, and with the united action of architectural and building fraternities it is highly probable that this much-needed reform will become a fact. At present, building operations in the city of New York suffer serious inconvenience through being under the control of three separate bodies, none of which are themselves independent, but portions of other departments. There is a bureau of buildings in connection with the Fire Department, and bureaus of plumbing and light and ventilation in the Health Department. The superintendence of buildings in a great city should be of sufficient importance to require a distinct organization of its own. The present arrangement entails very considerable extra expense through the duplication of plans and much loss of time and unnecessary journeys between different parts of the city. The item of cost of drawings is alone sufficient reason for establishing the new department, while much more thorough and satisfactory work must result from placing building operations under the control of an inde-

pendent organization with its own employees and its own head directly responsible to the mayor. Much of this responsibility is lost under the present system, in which closely connected parts are widely separated, and one of the most important objects of municipal care treated as minor parts of other departments with which, properly speaking, they have no organic connection. It is sincerely to be hoped that "practical politics" will not prevent this very necessary reform from becoming really effective. — *The Engineering Magazine.*

BOOK NOTICES.

ZIEGELBAUWERKE DES MITTELALTERS UND DER RENAISSANCE IN ITALIEN, nach Originalaufnahmen herausgegeben von Heinrich Strack, Professor an der Königlichen Technischen Hochschule und der Königlichen Kunstschule in Berlin. Berlin, Ernst Wasmuth.

This admirable collection of examples of the brick architecture of the Middle Ages and the renaissance in Italy is an unusually valuable addition to the documents illustrative of the best work of past times, now at the disposal of the architect. It is a work which every designer, at all interested in brick or terra-cotta architecture, will be anxious to add to his library. It is a large folio which contains, first, brief notes, which, though they do not profess to be complete, yet cover pretty thoroughly the more important brick and terra-cotta buildings in North Italy. Noteworthy points of these buildings are indicated, and there are brief historical notices with dates and references to other publications, in which drawings of the buildings mentioned are to be found, for these prefatory remarks are by no means confined to the buildings of which representations are given. The notes constitute in fact an outline arranged by localities of the history of brick and terra-cotta architecture in North Italy.

The plates which follow consist of measured elevations and details, beautifully rendered, in wash, and a number of photogravure reproductions from photographs of a large number of the more interesting of North Italian brick and terra-cotta buildings. The drawings are evidently made with great care and faithfulness. They are the work of pupils of Professor Strack working under his direction, and are the result of three successive trips of six weeks each made by the professor with a number of his pupils.

There is only one point in their work which we are inclined to criticise. The drawings are made by the pernicious method followed quite generally, we believe, in German schools, of representing the modelling by means of a series of light flat washes instead of by graded washes, with the result that instead of curved surfaces we have represented surfaces made up of a series of narrow flat planes. So that, for instance, a column of circular plan is represented almost as if polygonal, and the egg and dart mouldings appear as if chopped out in straight planes. But for this defect the drawings are beautiful examples of draughtsmanship.

EXAMPLES OF DOMESTIC COLONIAL ARCHITECTURE IN NEW ENGLAND. Compiled, photographed, and published by James M. Corner and E. E. Soderholtz, Boston Architectural Club, 6 Hamilton Place, Boston.

EXAMPLES OF DOMESTIC COLONIAL ARCHITECTURE IN MARYLAND AND VIRGINIA. By the same authors.

THE COLONIAL ARCHITECTURE OF MARYLAND, PENNSYLVANIA, AND VIRGINIA. Bates, Kimball & Guild, Boston.

Until recent years our interesting and simple architecture of colonial times, examples of which are scattered along our eastern seaboard, from Maine to the Carolinas, received but little attention. But of late it has become the fashion, a fashion which certainly has been of advantage to our domestic architecture in spite of many vagaries miscalling themselves "Colonial." The attention lately given to this style has naturally created a demand for books and photographs treating of the subject. No adequate historical treatment of our early architecture has yet appeared so far as we are aware; but the publications before us, besides being full of suggestion for the designer, bring together a mass of material which we hope may be made use of as a foundation for some historical consideration of the subject. The three portfolios, whose titles appear above, all consist of well-selected photographic views of the best examples of our early architecture in the localities named down to the beginning of the present century. In New England most of these buildings are of wood, though there are some, like the old buildings of Harvard College, which are of brick, and here we find some moulded brick used, all of which was imported from England. The best examples of colonial brickwork, however, are to be found in Pennsylvania, Maryland, and Virginia, though even here we find the more elaborate architectural features executed in wood. Most of this old brickwork is laid, it will be noticed, in Flemish bond, and in and about Philadelphia we find frequent examples of the decorative use of dark-colored over-burned brick, used as headers in connection with this bond, an example which has been followed in recent years, for instance, in the gate posts of the new gates at Harvard College. The publication of these works is most timely, and as they are attractively presented, well printed, and moderate in price, they should find a ready sale.

INTERCOMMUNICATION.

One of the aims which The Brickbuilder proposes to itself is to bring architects and brick manufacturers, as well as brick masons, into closer relationship, and as one means to this end it will open its columns to questions and answers, suggestions and criticisms, on all matters related in any way to the subject matter of the journal, whether practical or aesthetic. This department will be left entirely in the hands of our readers, and its value will depend on the interest they take in it. We have no doubt, however, that such an interest will be taken in it as will insure its great usefulness. We commend the department to architects, brick manufacturers, and brick masons, and urge them to make the freest use of our columns by sending any questions, suggestions, or points of interest which occur to them in the course of their daily practice and work, and as you, reader, whoever you may be, hope to profit by others' answers, we conjure you to reply to any question that may appear here, the answer to which your special knowledge enables you to give.

QUESTIONS.

1. Can any readers of The Brickbuilder tell me of some book giving instructions for figuring on complicated and ornamental brickwork? I am a brick manufacturer and would like some treatise giving practical illustrations of estimating from architects' and builders' drawings.

A. R. F., *Vancouver, B. C.*

2. What is a cheap method of laying a damp course in brick buildings — one that will prove effectual and permanent? Can any reader give instructions and approximate cost?

"Damp Course," *Bridgeport, Conn.*

CATALOGUES.

Sketch Book of the Philadelphia and Boston Face Brick Co., 4 Liberty Square, Boston.

This supplement to the catalogue of the company which issues it consists of a series of designs of varying excellence, principally for doorways, fireplaces, and cornices, showing applications of their brick. The sketches are very attractively made, and the designs, for the most part, are good. Designs, having the refinement of detail which these have, would be impossible without carefully designed and well modelled brick moulds, and the Philadelphia and Boston Company are certainly to be commended for the excellence of their brick mouldings. The preface to this "Sketch Book" states that the models and patterns were made by John Evans & Co., of Boston, the well-known architectural carvers, "after drawings by an experienced architect." The mouldings are, in fact, patterned more or less directly after old Italian originals. The catalogue shows the advantage of such a course, and we hope that other brick companies will take the hint and follow the example. If other manufacturers should get up other series of designs of their own, equal in excellence to these, we should look to see not only a marked improvement in the quality of brick architecture in different parts of the country, but an increased demand for moulded brick.

THE BRICKBUILDER COMPETITIONS.

We wish to again call attention to the series of competitions that this paper has instituted, and urge designers to enter them. We are exceedingly fortunate in securing as a jury Mr. Edmund M. Wheelwright, Mr. R. Clipston Sturgis, and Mr. H. Langford Warren, and the professional standing of these gentlemen insures not only absolute fairness in making awards but, what is equally important in competitions, intelligent judgment based upon a thorough knowledge of the principles of design and construction, and of brick design and construction in particular. It is our purpose to make these competitions as popular and profitable as possible, and to this end we invite suggestions from possible competitors, regarding selection of subjects, number and amount of awards, limit of time, methods of rendering,

etc. Before announcing a third competition, the subject for which has not been chosen, we would like to have some expression of opinion from our readers.

We would also say that no matter how few designs may be submitted, prizes will be awarded, providing the jury considers them at all acceptable. The decision of the jury, with criticism, will be published, together with the winning designs. In proportion as the number of competitors increases, the prizes will be increased, so as to make the award greater for winning against a greater number of competitors.

The matter of awarding special prizes to winners in a certain number of competitions is also under consideration, and should this be done, some system of averaging would be adopted so as to give the prize to the competitor showing the best general run of work. These competitions are not limited to subscribers, but are open to all designers, irrespective of age or location.

In our next number the awards on Competition No. 1 will be announced with criticisms by the judges, and at the same time the designs awarded first and second prizes in this competition will be published.

Competition No. 2 is for a two-story store front, the programme of which is fully announced in the February number; it is due the first of June.

THE ILLUSTRATIONS.

Plate 17. Providence Street Elevation, Bay State Trust Company, Boston Carl Fehmer, Architect.

This simple and well-proportioned design is executed in pressed brick with moulded brick trimmings and bands in the two lower stories of a brownish old-gold colored brick which form a pleasing and quiet contrast with the red brick. The design is as delightful in color as it is charming in proportion. The only thing to be regretted is the existence of the ugly and meaningless ears at the top, a misuse of the old Guelf battlement, the excuse for which we are entirely at a loss to divine.

Plate 18. Circular Window from the Broletto at Brescia.

Plate 19. Circular Window designed with stock patterns of ornamental bricks after a window in the Broletto at Brescia.

We give in these plates another comparison of an Italian window, with its nearest modern equivalent in terms of the brick furnished by our best brickmakers. This time it is the half of a large bull's-eye window from the same building from which we took the pointed window given in our last issue. The Italian example is even unusually refined and graceful with its happy contrast of large and small mouldings, and its admirable proportion of parts. The most striking difference between the two is in the ornamental members, Gothic motives being both rare and poor in our brickmakers' catalogues. We notice also the inevitable monotony in the sizes of the bricks in the modern translation, and the variety which is characteristic of its Italian prototype. But the most instructive comparison is to be made in the case of the sections of the windows in which the greater refinement and variety of the ancient example is apparent.

Plates 20, 21, 22, 23. Sever Hall, Harvard University. The late H. H. Richardson, Architect.

These elevations and details of Sever Hall, probably the most elaborate and carefully studied of Richardson's designs for brickwork, have been reproduced directly from the working drawings kindly lent us by Messrs. Shepley, Rutan, and Coolidge. The building is one of the finest examples of modern brickwork in this country, and the dignified and admirably proportioned design has been so much and so often admired that it is quite unnecessary for us to point out its fine qualities. The walls are entirely of brick, except the foundation course and steps which are of granite, and the skewbacks of the flat arches and the chimney caps which are of brownstone. Moulded bricks and built-up dentils of various kinds are extensively used. The bricks used, except in the carved portions, are a special handmade common brick twelve inches long and about two and a half inches wide, a size of which Mr. Richardson was very fond, and which, as will be seen, differs both from the standard size and from the so-called "Pompeiian" brick. It is a brick the size of which is perfectly in harmony with the bold and massive scale characteristic of Richardson's work. The moulded bricks used are not pressed but are specially made, common bricks. The ornamental portions are all of carved brick, for which a fine pressed brick was used. The drawings here published show only the position but not the character or design of this carving. The roof and crestings are of red tile; the conductors and gutters are of copper. The central part of the east elevation (of which we publish a detail) is slightly bowed out in plan in the second and third stories.

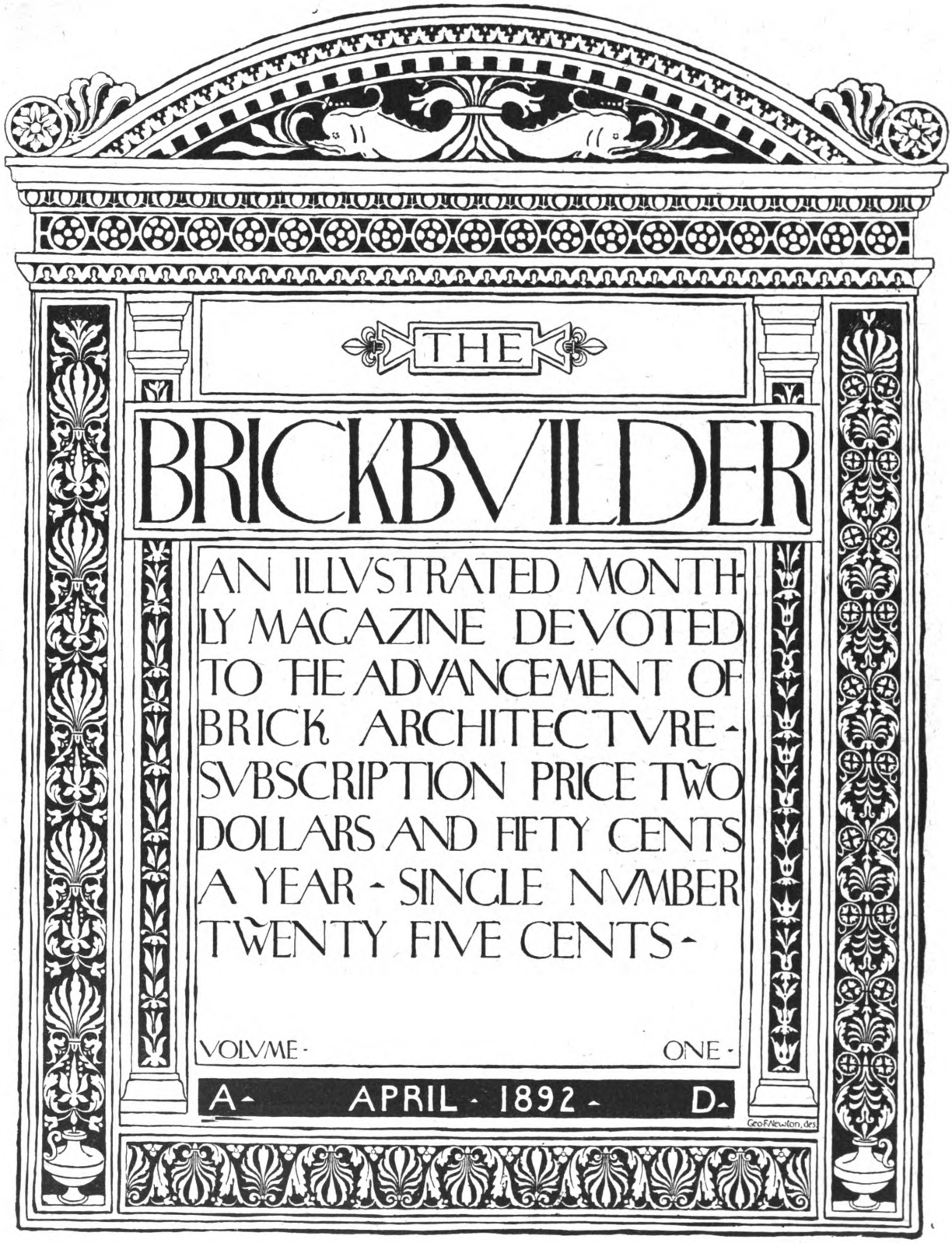
Plate 24. Some Boston Windows.

We publish these merely as examples of some of the simpler windows to be found in current work. The plate may serve to indicate how much better is a simply treated brick opening than one in which the brick is combined in an ill-considered manner with stone.

The windows from West Chester Park and Columbus Avenue certainly show "what to don't." In the latter example either the arch or the lintel might have been well alone, but they certainly are unfortunate in combination. The little pair of windows from Warren Avenue show the unfortunate effect of a keystone in a pointed arch.

Supplement. Front of the Baptistery and Church of San Stefano, Bologna.

Our supplement in this number, the first of the series of examples of old brick architecture which we propose to present to our readers, shows the front of the curious series of seven churches generally known as San Stefano at Bologna. The oldest of the group of buildings is that to the right of our plate: the old baptistery, originally built in the tenth century, and subsequently altered in the twelfth, at which time a sepulchre was built in the interior, whence the name San Sepolcro, by which it is sometimes known. The columns which support the dome in the interior were at that time strengthened by brick piers. The other church shown in our plate is but little later than the baptistery; but the group of buildings was only completed, substantially as we now see it, late in the twelfth or even in the thirteenth century. The buildings have been recently restored, and have in the process unfortunately lost something of the charm of color they formerly had. The group includes two interesting cloisters, the Corte di Pilato, which dates from 1019, and which bears a strong resemblance to the Narthex of S. Ambrogio, at Milan, and the double cloister of San Gerusalemme. The latter is especially interesting, both from the arcade in two stories which surrounds it, and from the rich color of the enamelled tiles, which, in ever-changing variety of pattern, fill the tympanums of the upper arcades, and contrast most beautifully with the dark rich red of the brickwork and the brighter red of the tile roofs above, and the blue sky beyond. The front of the buildings, as shown in our plate, gives a variety of admirable and suggestive examples of brick cornices, very rich in effect, while made up of the simplest forms. It will be noticed that there is almost no moulded brick anywhere. The building is an example of the charming and rich effects to be obtained by the use of common brick, where there is sufficient variety in the size of the brick. Stone, as well as enamelled brick and tile, and common brick, are used in the various ornamental bands and diaper patterns. It is curious to note the extreme irregularity in the size of the brick, which, of course, were made by hand, and apparently without much regard to size or shape except in width. The bond is equally irregular; but as many of the brick are almost square, it is impossible to tell just where the bond is. The effect of the whole, rude as the workmanship is — and before restoration, it appeared much ruder — is exceedingly picturesque and attractive. Altogether the group of buildings is one of the most curious in Europe. Unfortunately the charm of quiet color our plate cannot reproduce.



The Brickbuilder.

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Happening the other day to pass through East Cambridge, we were struck by the appearance of a huge, plain wall of brick, surmounted by an effective but simple cornice, the wall being almost unbroken by pilasters or openings of any kind.

It is built entirely of common brick laid in ordinary white mortar. There is in this building almost no attempt at design. It is purely utilitarian, and yet it is a remarkable instance of the dignity and impressiveness there may be in an absolutely plain brick wall. If well proportioned and crowned with a good cornice it is easily made a thing of beauty, and is always preferable to the tortured and restless façades which so frequently do duty as architecture. The lesson of simplicity should be an easy one, but how difficult it seems to learn!

The brick manufacturers have placed at the command of architects the greatest variety of pressed bricks of various colors, so that there is practically no limit to the combinations of color that are possible. But it has often occurred to us that more use might be made of the common bricks of different colors that are to be found in different parts of the country, especially if the quality of manufacture of some of these bricks was improved as we suggested in a particular case in our last issue. Besides the Tennessee clay we then mentioned, which can be made to produce a mottled brick of low cost, the common light yellow brick of the Northwest could be used with great effect in combination; and there are doubtless others in other parts of the country that would be available. The cost of these bricks is so low that even with freight charges added they still would be a moderate cost brick delivered in any part of the country. But even in the Northwest itself these brick, which are of a pleasing light yellow color, are not generally regarded as fit for anything but interior or rear walls, mainly, doubtless, because they are so inexpensive. That they could be improved by a little more care in their manufacture there can be no doubt.

We have already pointed out, and it will be noticed by referring to any of the representations of Italian pointed arched windows which we have published, that it was the Italian method not to strike the joints of the arch bricks from the centres of the arcs, as we do, but from the centre of the opening on the springing line. This method obviates the difficulty which the modern method produces at the point of the arch, cutting the brick up into small wedge-shaped pieces, an awkwardness which we sometimes see avoided by the ugly and incongruous expedient of a keystone, regardless of the fact that a keystone in a pointed arch is always out of place. Such a keystone must be regarded as a worse defect than that which it is sought to remedy. To adopt the Italian method, however, is by no means easy, and is still more difficult if the arch is moulded; for by this method of alignment of the arch brick, every brick is of a different shape through the whole sweep of the arch, and this, while it gives to the arch a peculiar grace and charm, and was not so difficult of accomplishment with hand-made brick, and the cheap labor of the Middle Ages, might at first seem absolutely impracticable with our machine-made brick. But we believe it by no means impossible to invent a machine that should accomplish this at very slight additional expense. Such an invention would be useful, not only in the case of pointed arches, but even more so in the case of flat arches. With present methods it is impossible to carry an elaborate moulding across the under side of a flat arch, and give the arch brick any considerable radiation. What is needed is an arrangement by which the bottom of the box in which the brick are pressed can be easily tilted and fixed at any desired angle, and the end of the plunger which fits into the box be made at the same time to conform to the same angle. This does not seem as difficult of accomplishment as many things that have already been done, and we do not doubt that, once the want is appreciated, some ingenious person will be found to give the solution of the problem.

Mr. Edward Atkinson closes his paper entitled "Fire Risks on Tall Office Buildings," in the May number of the *Engineering Magazine*, with the following remarks. "May we not," he says, "now be about to enter the *Age of Clay*, having passed through the several phases of timber, light wood, iron, granite, and steel? One may almost venture to say that we have as yet no science applied to bricks; no science applied to mortar or cement; no true art of construction in brick, fire-clay, and tile. We are groping our way to find out how to use our huge abundance of the best materials, and to adapt them to the climate and conditions of this country. One can even now conceive of a building of the Moorish tile construction — finished inside with wood pulp rendered incombustible, or with terra-cotta or other form of clay — walled within with plaster board, and covered on the outside of the roof with indurated fibre tiles, light, strong, and impervious to water. The elements exist even now, which, when combined, may render it possible to construct a building at low cost, which will be sufficiently fireproof to resist the combustion of its contents. This may be considered a somewhat visionary hypothesis, but such a building is, nevertheless, within the sight of any one who attempts a forecast in the light of the fires of the past."

Mr. Atkinson's prognostications are interesting, and many indications, besides the demands of fireproof construction, seem to point in the direction he suggests. That the clay products, when well made, form the most durable of building materials, both as to resistance to the effects of time and of fire, has long been admitted. As the necessity for fireproof building becomes more imperative, and its requirements better understood, it seems more than likely that brick and terra-cotta and tile will come more and more into use.

It seems fortunate that just at this time also more attention is being paid to the artistic treatment of clay materials, and, as the quality of these materials has never before been so good, there seems every reason to hope for a new and interesting development of brick and terra-cotta architecture. The use of the tile vault, known as the Guastavino vault, together with brick and terra-cotta, if logically carried out, and made to suggest the architectural forms, and with decorative treatments in glazed and enamelled terra-cottas, especially in the interior, must, it would seem, ultimately lead to new forms of art. But at present, what Mr. Atkinson so truly says of the want of science, as applied to brick and terra-cotta constructions, and our groping efforts after new developments, is equally true on the side of art.

We believe the late Mr. Richardson's influence is largely responsible for the frequency with which the tops of chimneys and parapet walls are sloped back instead of being finished with projecting copings as good construction requires. It is a curious fact, that the imitators of a great man will almost invariably copy his small vices rather than his great virtues. The practice to which we refer is especially reprehensible in the case of brickwork, which requires an overhanging cornice or coping to protect the joints from the weather at the tops of the walls where they are most exposed, and where the washing out of joints most easily leads to disintegration. Only the other day we happened to see in one of our suburbs an important brick building, whose parapets and chimneys had been coped with granite, which had no projection beyond the face of the wall, but sloped back from it, with the result that the upper joints had all been washed out and the parapet walls were bulging out and falling to pieces, and the masons were busy taking them down to rebuild. Yet the building had been finished but a very few years. All brick walls should have projecting copings of stone or terra-cotta, with a hollow drip to throw off the water.

The aspect of New York streets has been rapidly changing of late years both in the business and residence portions of the city. The many tall office buildings and apartment houses which have sprung up have utterly altered the scale and proportion of the streets, so that of comparatively broad streets apparently (and also practically, so far as light is concerned) very narrow ones have been made. Fine new residences are in the new sections creating a new city very different in appearance from the old, and in the old sections are gradually replacing the wearisome monotony of the streets upon streets of brownstone fronts, ugly barracks amid whose bewildering similarity the stranger vainly seeks to find his way, and whose gloomy and forbidding ugliness still remains in many quarters to deaden the sensibility to beauty of those that dwell there. Older than the brownstone fronts there was, to be sure, a city hardly less monotonous, perhaps, but comparatively refined and suggestive of cultured reserve and dignity of life; but of this so few vestiges remain that they have ceased to be characteristic. Almost as characteristic of the New York of fifteen years ago as the brownstone, is the ugly brick front which, generally built of poor brick and washed over with the most excruciating and most aggressive of red colors, still makes large sections of the city hideous even where it is not partly covered with still more hideous placards and signboards. Doubtless the repulsive ugliness of most New York red brickwork has contributed largely to the infrequency of the use made of red brick in New York in recent years, and it is to be said that the red pressed brick which is sometimes used is little better in color than the ugly red paint which does so much to make a transit through New York City painful to the sensitive and beauty-loving visitor. Sometimes otherwise good buildings are much injured in general appearance by the ugly monotony and peculiarly strident redness of the brick, as, for instance, in the case of the New York Cancer Hospital. It is, we cannot doubt, partly on account of the very natural reaction against red brick, which has resulted from the abuses above referred to, that in the better class of buildings recently built in New York, red brick seems to have been so much avoided. Brick has continued largely in use, but brick fronts are generally of yellow or old gold, so much so that the yellow or cream colored brick is getting to be as characteristic of New York as the brick with its ugly red paint used to be. The use of cream colored or yellow brick with trimming of white terra-cotta is, indeed, receiving a development in New York with characteristics distinctly differing from what is usual in other cities. These materials are not only more commonly used there than elsewhere, but the detail is richer, sometimes indeed overloaded, as in fact New York taste is apt to demand. In many cases two or three courses of yellow brick alternate with a course of terra-cotta, ornamented in low relief with a guilloche or other pattern, throughout a whole story or even an entire building; and sometimes the corners are treated in this way, using the ornamented terra-cotta bands as quoins. It cannot be denied that these buildings form an important factor in the movement which is so greatly improving the appearance of New York. In such buildings as the Judson Memorial and the Madison Square Gardens these materials have found their richest and most lavish and also their most successful treatment. But while the use of the yellow brick has become so common in the metropolis, there has been hardly any successful treatment of red brick. The horrors of the past seem to have frightened designers of taste away from it almost altogether, while yet in the soft gray redness of a wall of good red brick are possibilities of just as excellent and just as effective design as in the lighter colors. But it is something to have recognized the ugliness of the New York painted red wall, or the almost equally ugly wall of culled pressed brick of bad color.

A correspondent in St. Louis informs us that a building has recently been erected there, in which all of the work usually of stone is made from fire-clay cast solid or modelled, and burned. The architects there are now able to get sills in one piece, up to five feet in length; these sills are of solid brick or fire-clay, and true enough for all practical purposes. The same correspondent also writes that the architects of St. Louis are taking hold of the opportunities afforded by the large brick manufacturers and are doing some very good, distinctively brick architecture, that shows new ideas and yet does not depend upon novelty for effectiveness.

OUR FUTURE SUPPLEMENTS.

Out of a very large collection we have selected the following subjects for supplements, representing Italian work, and will give them adequate reproduction, with detailed descriptions, in the numbers hereafter published: —

The Certosa, at Pavia.
Sta. Maria delle Grazie, Milan.
Foro dei Mercanti, Bologna.
S. Giorgio in Velabro, Rome.
Casa dei Pittori Caracci, Bologna.
S. Marco, Milan.
S. Ambrogio, Milan.
Campanile, SS. Giovanni e Paolo sul Celio, Rome.
S. Donato, Murano.
Sta. Maria in Strada, Monza.
S. Eustorgio, Milan.

A later selection from Spanish, French, and Flemish work will be made, so that our readers will have a collection representing the best of the older work throughout Europe.

THE USE OF BRICK.

Since the days when the Israelites made their unbaked bricks of clay and straw for the Pharaohs of Egypt, and probably long before the time of authentic history, bricks have been the most largely used and the most important of all building materials.

In every part of the civilized world the materials for their manufacture are found; they are easy to make, and when well made of the best description, they are unequalled for durability. It is little wonder that in all ages and in all places the art of brickmaking should have been extensively carried on. Egypt, Assyria, Persia, Greece, all made more or less perfect burnt brick, and brought the finer branches of terra-cotta to a perfection which has never been exceeded. From a constructional point of view it was left to the Romans, with the general introduction of the arch and the vault, to carry the use of the brick to still higher possibilities.

During the darker mediæval ages which followed upon the dismemberment of the Roman Empire, brick seems to have somewhat lapsed into disuse, — at all events it had no longer the prestige it enjoyed in Rome, where the great baths, aqueducts, and public buildings of the Empire had their arches and vaults of brick, whether used as a constructive material to be faced with marble and mosaic, or themselves both the construction and decoration.

There was in the decline of the Empire a lapse from a debased civilization to a more barbarous but perhaps more healthy atmosphere.

The classicism of Rome received a new and semi-barbarous life in the Romanesque forms, and stone largely replaced brick and marble. Northern Europe was overrun with barbarous hordes, England was in the throes of giving birth to a new and great kingdom. In all the then civilized world, men felt that they were working out new problems, apart and cut loose from all that had preceded them. The civilization, the knowledge, the culture of Greece and Rome, their art and their learning, could not appeal to the only learned class, who were priests of a new order of things, to whom Greece and Rome — the old Rome — but typified all that was evil and harmful, and to the rest of mankind it appealed not, for they knew nought of it. They were sufficiently engrossed in holding their own place in the world, in defending their home, or their lord's home, or their king's land. So building, which has always kept pace with civilization, had a seeming set-back.

From this great upheaval of the world, as from upheavals that occur in the lives of individuals, came, nevertheless, a truer and stronger growth. The vigorous life and development of Romanesque indicated how strong was the new artistic impetus in the south, while in the north Gothic gradually grew to finer and fuller perfection until there were erected all over Europe the magnificent cathedrals, now, as then, marvels of constructive art and of decorative ability, the highest combination of decorative construction and constructive decoration, of utility and beauty.

It was not until all this had been fairly achieved that the world turned again to its past from which, during all these years, it had only unconsciously drawn, to see what could be learned from that which had gone before, and, with the swing of the pendulum, all the world was on fire with the Renaissance. Greek art and Greek literature, classic forms and classic tongues, were the only interests.

Violent as was this reaction to the study of the long-neglected classic, it brought with it greater benefits, for much that was grand and good in the older civilization, and which had run the risk of being entirely lost to the world, was now recovered; and printing gave the assurance that all the accumulated knowledge of the world would now be permanently preserved.

With the Renaissance, brickwork again came into prominence. It was used extensively in Holland, in Tudor England, in France and in Tuscany, in North Germany and in Lombardy, and in all these countries, with the constructive common-sense which makes their brickwork beautiful, and noble examples for all times. In this country, though taught originally by good Dutch and English masons, we have so carefully avoided the principles of construction as to have made our brickwork — with the best of materials — the most wretched artistically.

The keynote of all brickwork is the joint. The wall is composed of small pieces. The true builder, the true artist, will never attempt to disguise this, but will rather make it serve his purpose by showing it as clearly as possible and bringing beauty out of the materials with which he has to work. The one knows that on the quality of his joint and the careful bedding of his brick depends the stability of his wall, and the other is fully aware that what is necessary in construction ought to make an element in the beauty of the whole.

This principle was thoroughly recognized among all the people whose brickwork stands to-day as examples indicating the direction in which alone true advance can be made. There are various methods of striking the joint, of which the best simple one is that which cuts back the upper portion of the joint, and makes an even splay out to the ashlar, thus making each course to form a drip over the joint, giving the joint itself an inclination which allows the water to run freely off of it. This can be done by a good mason with his trowel, but it can be more perfectly done with a tool. It has the disadvantage of shadowing part of the joint, and so losing the value of its width.

Another joint is made by flattening the protruding mortar to the face of the ashlar with trowel, and then with straight edge and knife cutting off both edges to a true line. This, if the mortar is of the best, will stand well and is very effective. It is a joint used frequently in Holland, where the bricks are often more or less irregular, and, by this means, using a very wide mortar joint, they are able to get perfectly true horizontal lines even where the bricks themselves are warped or crooked.

There are also the concave and convex joint both formed with tool and generally used only on fine work, where the bricks form a true line.

All have their special uses and special advantages, and the various merits of each should be carefully considered by the architect in connection with each piece of brickwork which is undertaken. In all cases, it is important that the horizontal joint should be absolutely true, and the perpendicular joints accurately plumbed over each other.

The second point of importance is the necessity of so laying the small pieces of material as to make the wall a homogeneous whole, and this gives us the various forms of bond, which, being the necessity of the builder, are made the opportunity of the architect to obtain beauty.

Let us run over shortly the various methods of the builder for attaining the homogeneous wall and see what the architect has evolved from his data. The chief bonds are as follows: Alternate rows of headers and stretchers which may be arranged with the joints of each course of stretchers perpendicularly over the similar course below, or with the stretcher rows laid to break joint with each other. These give *first*, the so-called English bond (in most common use in England for ordinary work), and, *second*, the cross bond, which is that most used in Belgium and Holland.

The latter, while equally perfect in bond, is far handsomer in appearance, and has just that touch of refinement which one would expect to find in an artistic people like the Dutch as contrasted with the more matter-of-fact English, who, having found the best bond from a constructional point of view, are contented to let the matter rest there. The palace at Mechlin by Keldermans and the outlying buildings of the castle at Aertselaer are beautiful examples of the artistic effect to be obtained by carefully laying this bond even without variety of color. It will be seen that the change in the position of the header joint gives a diagonal line of vertical joints, where the English emphasizes only the vertical and horizontal lines.

Third, we have alternate stretchers and headers in each course, called Flemish bond — though never, so far as I know, used in Flanders — and possibly so called because it presented a better appearance than the English bond, and was therefore considered "flemished" or finished. This bond, while quite as strong for all practical purposes as the English or the cross bond, has the advantage of evenly distributing headers and stretchers so that if, as often occurs, the headers are a different color from the stretchers, we avoid the stripes which the other bond gives. This bond also may be arranged in two ways: either with the headers placed over the centre of the stretchers, or placed over the centre of the joint, the former the more usual, giving an equal distribution of joints in the wall surface, the latter giving the joints but a quarter brick lap over the joint below, and emphasizing diagonals both of the joints and bricks.

Besides these ordinary bonds there are an infinite variety of less useful ones, which, however, give especial opportunities for diapering, such as three headers and a stretcher, in each course, called garden bond in England, and those using brick on edge. A good example of fancy bond is seen in the St. John's Inn at Hoorn.

The use of face brick of far greater cost than the common brick, and the economy of using as few headers as possible in the

facing, have led us either to be content with headers once in every seventh course, or, still worse, to make use of blind bond, where stretchers only appear on the face, and all is reduced to the dead uniformity of a painted surface ; the neglect of constructive laws thus causing immediately a loss of beauty.

It is unfortunate both for our joint and our bond in this country that we have not, as in England, a fixed size of brick, or, at least, that there should not be always a perfect ratio between the various dimensions, so that two headers and a joint will make a stretcher, and so that we may always bond thoroughly a face brick with a common brick. On the other hand, our variety of sizes gives us many opportunities for effects which could not be obtained with uniform brick.

The employment of the various bonds, the patterns they naturally form when so orderly laid, and the variations of color found in common brick, suggested to the builders of Renaissance centuries the frequent use of diapers, accented more or less by colors. A little study of the possibilities of patterns without cutting brick, *i. e.*, using a regular bond, is surprising, and gives ample — indeed, often too ample — chance for decoration. We are very familiar with late examples of the unwise use of colored brick in decorative diapers, but the earlier workers were content, and wisely so, with comparatively simple design and quiet contrasts of color. Here, as in every other place where the architect is tempted to use color, the greatest care must be exercised, and even with care and thought it is not granted to all architects, any more than it is to all painters, to use color wisely. Owing to this, many of the best critics and teachers of architecture have strongly deprecated the use of color, and monotones are certainly safer. It does, however, sometimes happen that an architect has arisen here and there who has been able to show us what color can do for architecture when well treated, and we have admirable facilities in the colored brick of all shades now manufactured here, and in our excellent terra-cottas.

Glazes and enamels again give us great opportunities, for in them we have a permanent color of superb brilliancy and great durability, and it is hoped that we shall develop such color sense as shall enable us to use these materials wisely and well.

In Italy, the land of colorists, and in the East generally, where the color sense seems very much developed, we have excellent examples of what can be done by a judicious use of color in the outside of our houses and public buildings. In the East, where Persian or Moorish influences were felt, enamels were freely used for these purposes, either by themselves or combined with the various colors of polished marble. In Italy, marble in various colors was used profusely and with great judgment. Colored glazes, such as those of the Della Robbias, were also somewhat used, and in the brickwork also we have many examples of the careful use of some simple colors.

All these furnish us with examples which may be very readily adapted to brick, or at least furnish us with most admirable motives, showing the lines on which our color treatment should be based. What these people have succeeded in doing with the more precious materials may at least serve as examples to us of what we may accomplish with brick and terra-cotta of various colors, both glazed and unglazed.

To return, however, to the use of diapers. Their chief object is to give variety to a wall space, and, therefore, they should not be so marked as to make the pattern insistent, and should rather give a sense of variety, and suggest that study has been given even to the bare wall, than to lead the eye to the tracing of the design.

It is better to leave something to the imagination, as a diaper too pronounced is apt to be wearisome. Excellent examples of good diaper may be seen in Aduard, in Friesland, and in the houses in Ypres illustrated in Ysendyck, and in the various chateaux of France, especially the brick façade of the Chateau de Blois, and in many of the Elizabethan houses of England. Nor do we have to-day to go so far afield for good examples, as we have in the Madison Square tower in New York a beautifully executed piece of work, most suggestive of thought and most charming in color.

The capabilities of brick do not end, however, in the treatment of wall surfaces; for with moulded brick we have endless opportunities for good string courses and mouldings, and in terra-cotta we have unbounded field both of form, color, and enrichment.

As in the use of color there is danger, so too is there in the use of moulded ornament. A mould once made, it is almost as cheap to have moulded and ornamental work, as to have it plain, and one is strongly tempted to a profuse use of mouldings and modellings. Certain classes of ornament, such as figures or foliage, or any of the less conventional forms, do not bear reduplication, and the evils of using terra-cotta for such purposes are seen in many of the semi-Gothic buildings erected during the Doulton revival of terra-cotta, as, for example, the Natural History Museum in London, where figures of animals and plant forms are reproduced in dull monotony, or even to a less marked extent in the Museum of Fine Arts in Boston.

On the other hand, simple Renaissance patterns of conventional mould may be reduplicated and used in masses with success, and indeed seem more proper when so moulded than when carefully executed in stone by the hand of the carver; and the same may be said of Gothic ornamental diapers.

For mouldings, both the English and Dutch have made large use of hand rubbed or carved rather than moulded brick, and both countries are rich in examples of this work. The brick for this work are made of very fine clay well mixed with sand, which produces a brick very even in texture, and so soft as to enable the mason to cut it readily with a small saw or chisel, or grind it down on a wheel, or rub off with a mould.

The great objection to the use of such brick in this country would be that it is very porous and soft, and would be likely to disintegrate rapidly under the effects of frost. Even in England, where the frost is not so important a factor, the bricks wear away very rapidly. I have seen houses in London that have been standing not more than ten years, where the string courses and mouldings, exposed to the wear of passers-by, have lost all their arrises, and had their angles completely rounded off. The same brick is constantly used for their carving as well as moulding. With us, however, the hand rubbed moulding is unknown; and carved brick, which was used sparingly here by the late Mr. Richardson, has never come into general use, it being, I think, rightly felt that a homogeneous mass is a more proper field for sculpture than a mass of jointed blocks, especially when the material, if durable, is hard to carve. In Bruges many houses showing the profuse use of such ornament are still standing in good preservation, and fine examples are scattered through Holland and Belgium. In England the country is rich in old brick buildings of the Queen Anne and Georgian periods, which were profusely covered with ornaments and enrichments executed in brick; and much good work has been done of late years by Mr. Norman Shaw, and Messrs. Ernest George & Peto, both in London and in the country. Throughout the newer portions of Kensington, in the Albert mansions and the large house adjoining them in Hyde Park, and many of the artists' houses in the neighborhood of St. Johns Wood, there are very beautiful examples of quiet and dignified use of plain red brick with well designed and well executed mouldings.

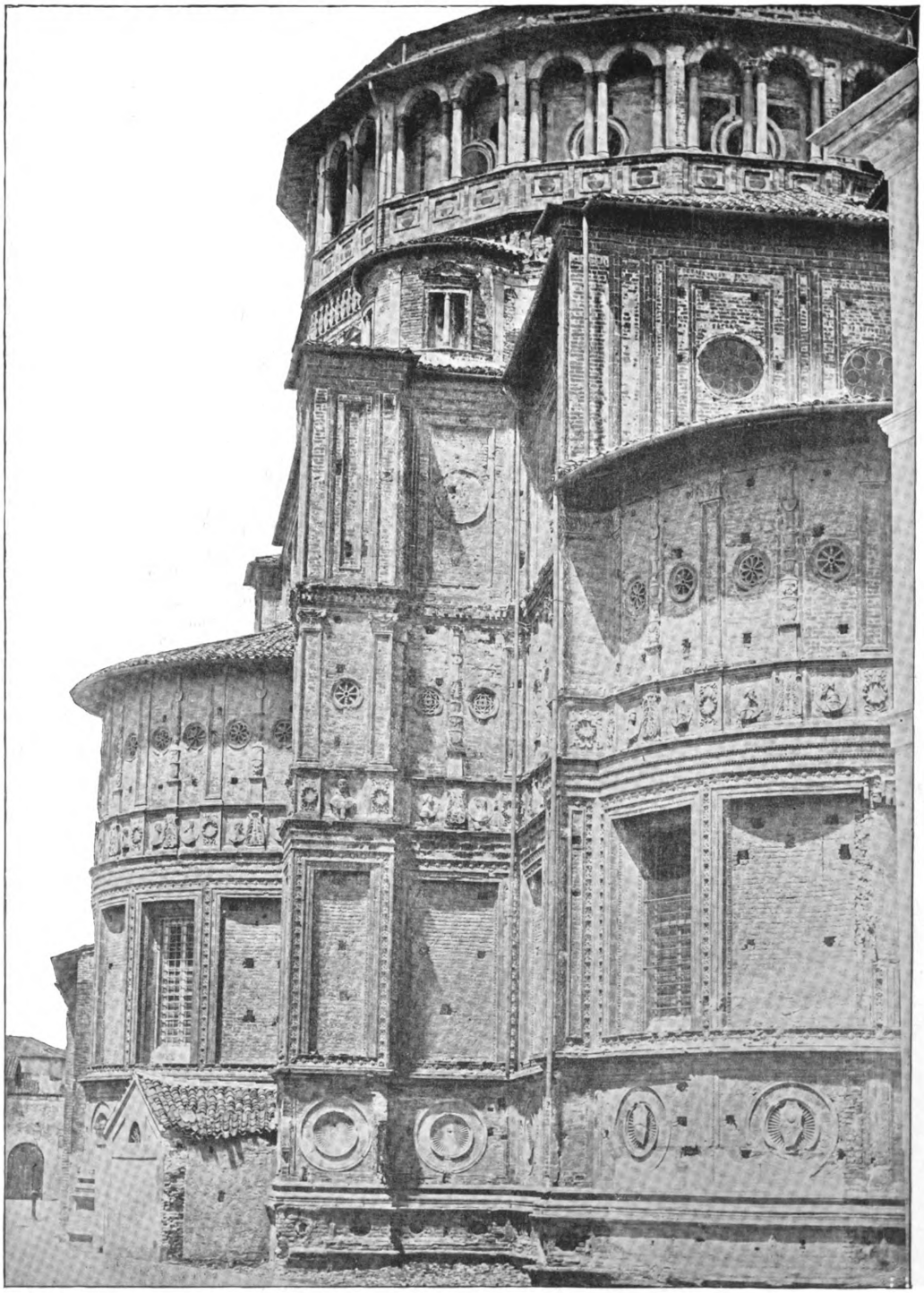
It may be said in passing, that the rubbed mouldings, thus executed, have a crispness and texture which we do not obtain in moulded brick.

With history at our back, and modern facilities and advance before us, we see how large is the field thus opened in the use of brick and terra-cotta, and we have a still further opportunity in the conjunction of brick and stone.

There are certain places where stone seems almost a necessity, or is at all events the natural material to use, as for window sills, or for horizontal window heads, or where angles occur which are not rectangular, or again where great projections occur, as in large corbels and cornices.

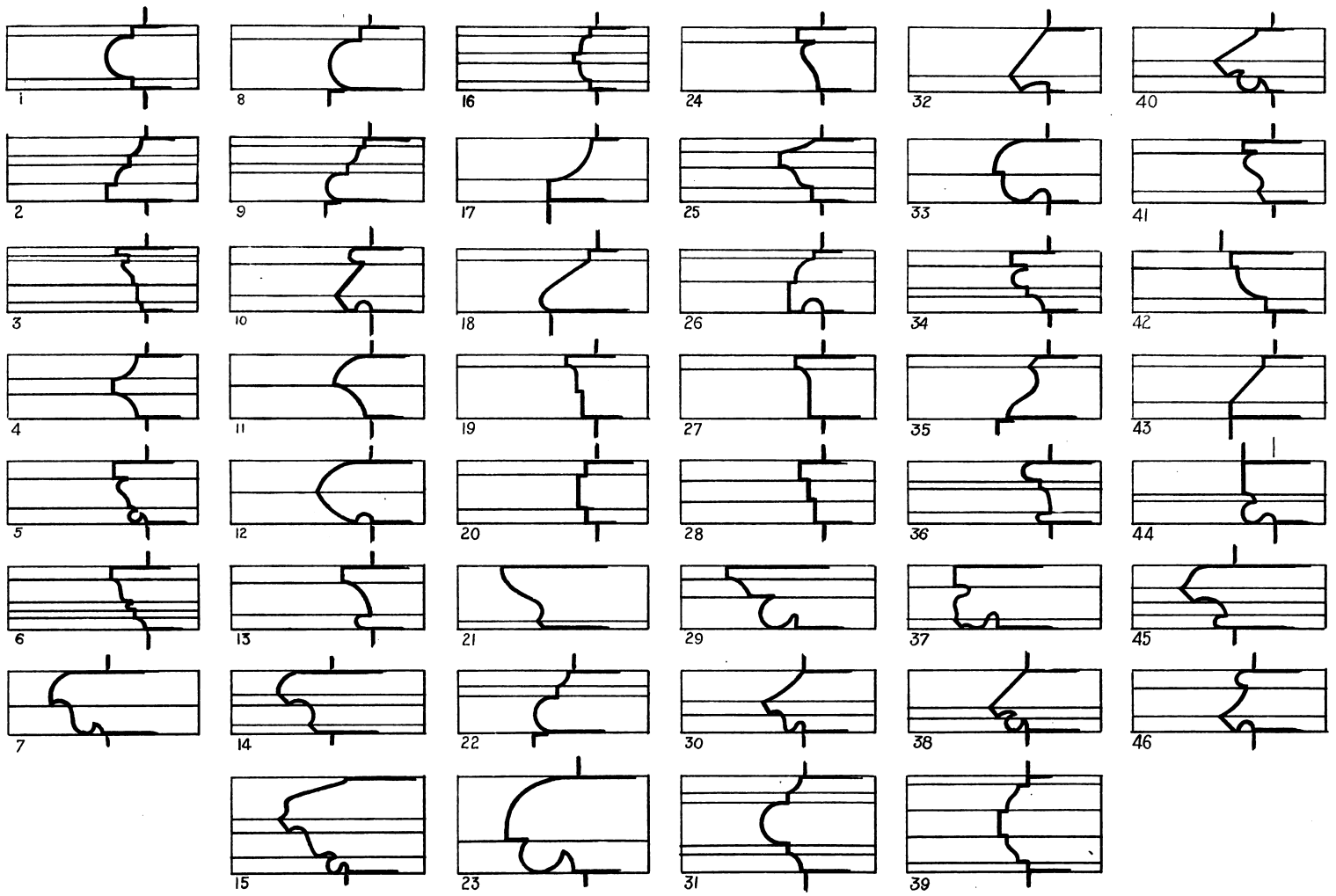
In many cases, also, the large blocks of stone are needed from an architectural standpoint, to give massiveness to a basement, or to reinforce and emphasize an angle. It is true that terra-cotta in large blocks may be used, even in such cases as this, but its natural surface and texture are not always adapted to very large areas, and if moulded to a rough surface generally suggests imitation of stone. Here again we have a wealth of good examples, such as the Market Building at Haarlem by Lieven de Key, the various buildings by Keldermans, and many of the best town halls. In France, the Chateaux de Blois, des Ifs, Martainville sur Ry; and in England, the Holland House in London, and an infinite number of important halls and houses throughout the country, for in England this was a very favorite and very successfully treated style. We see also how it can be carried to extremes, as in many of the Dutch buildings, dotted all over with spots of white stone, picturesque even in its extravagance.

In all cases, I think, the use of brick in imitation of stone is to be avoided, as are all methods which use one material in imitation of another; for we lose the distinctive character of the material we



CHURCH OF S. MARIA DELLE GRAZIE, MILAN.

Second of a Series of Photographs of Foreign Brickwork.



Drawn for The Brickbuilder

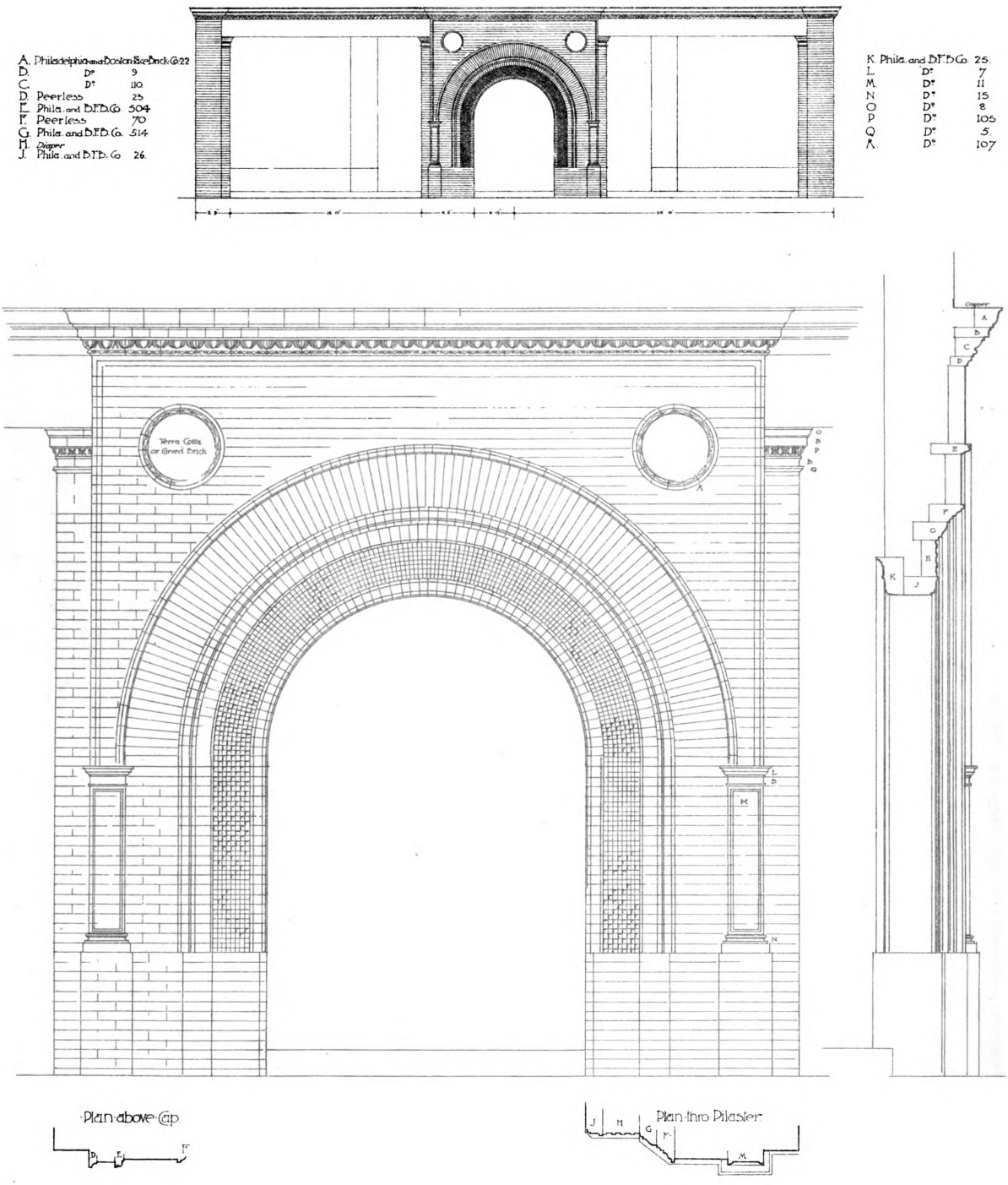
Forbes Co.

SOME ENGLISH MOULDED BRICKS.

REDRAWN FROM THE CATALOGUE OF MESSRS. JOHNSON & CO., KEYMER JUNCTION, SUSSEX, ENG.

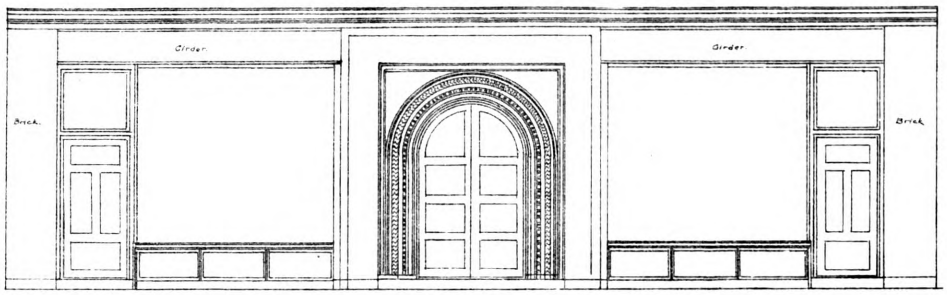
DESIGN FOR AN ARCHED ENTRANCE

by "Tuscan"

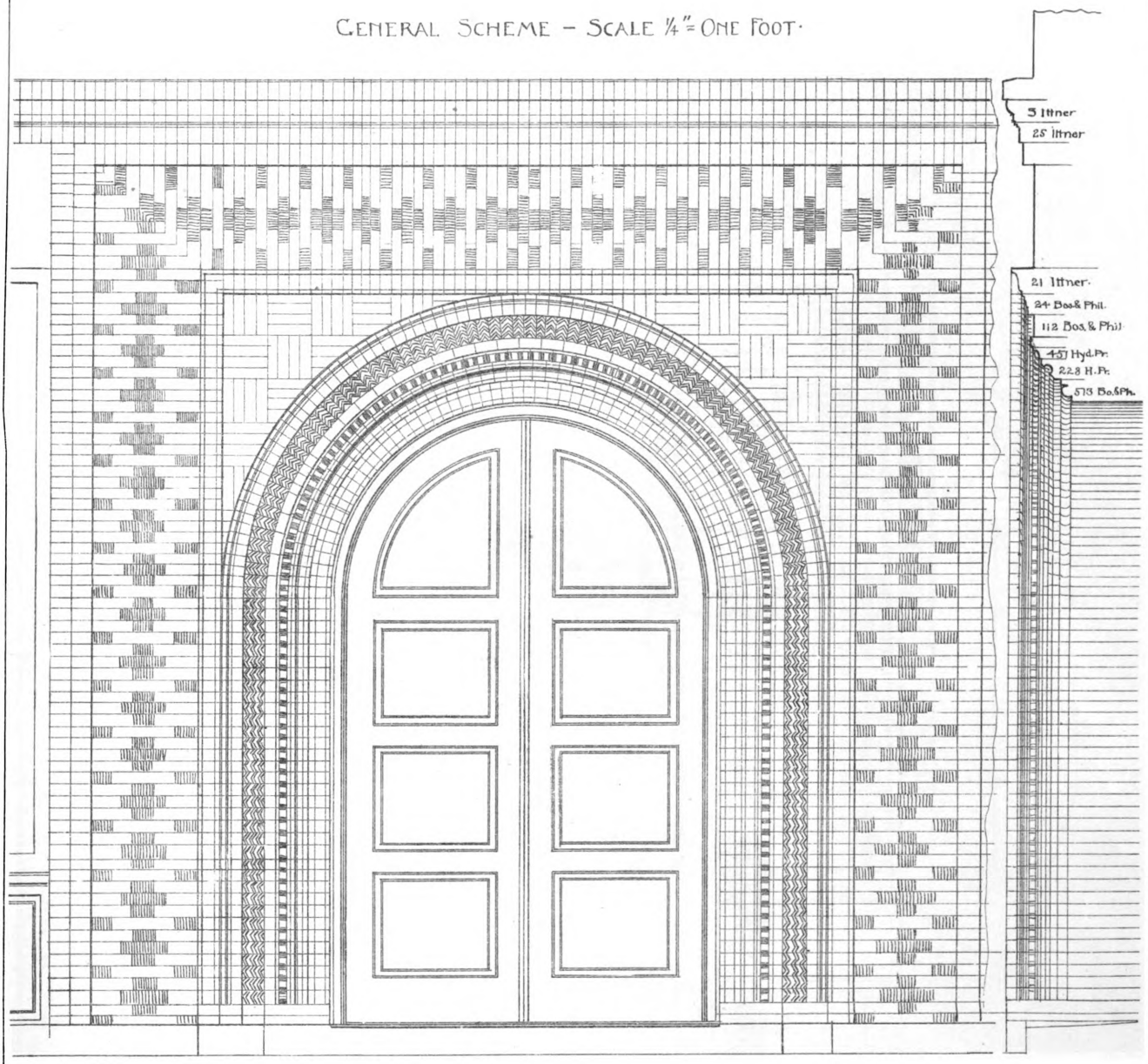


BRICKBUILDER COMPETITION, NUMBER ONE.

FIRST PRIZE: BY I. T. MACLAREN, PHILADELPHIA, PA.



GENERAL SCHEME – SCALE ¼" = ONE FOOT.



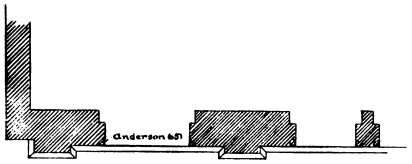
ELEVATION · AT · INCH · SCALE

A · BRICK · DOORWAY

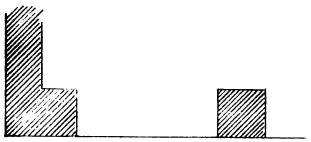
SUBMITTED BY "PIACENZA"

BRICKBUILDER COMPETITION, NUMBER ONE.

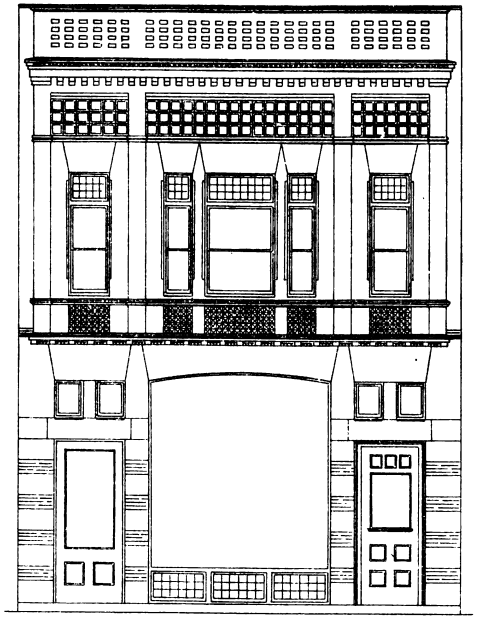
SECOND PRIZE: BY W. H. KILHAM, BOSTON, MASS.



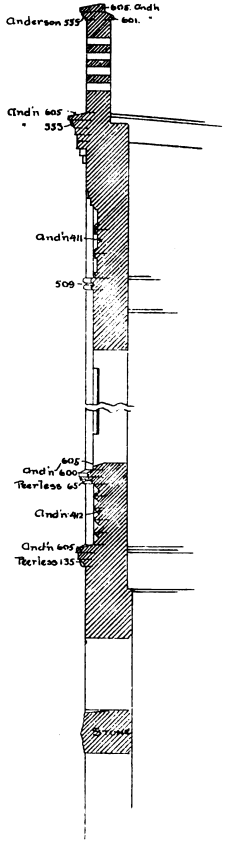
—PLAN AT WINDOWS.—

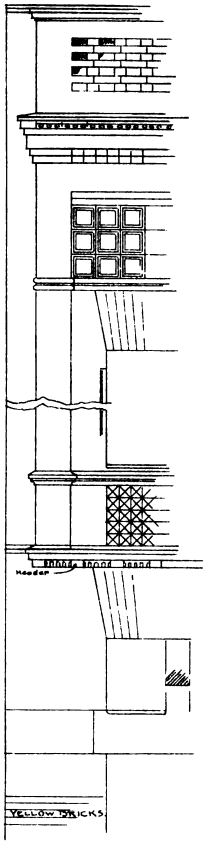


—PLAN AT ENTRANCE.—



—FRONT ELEVATION—





BRICKBUILDER COMPETITION

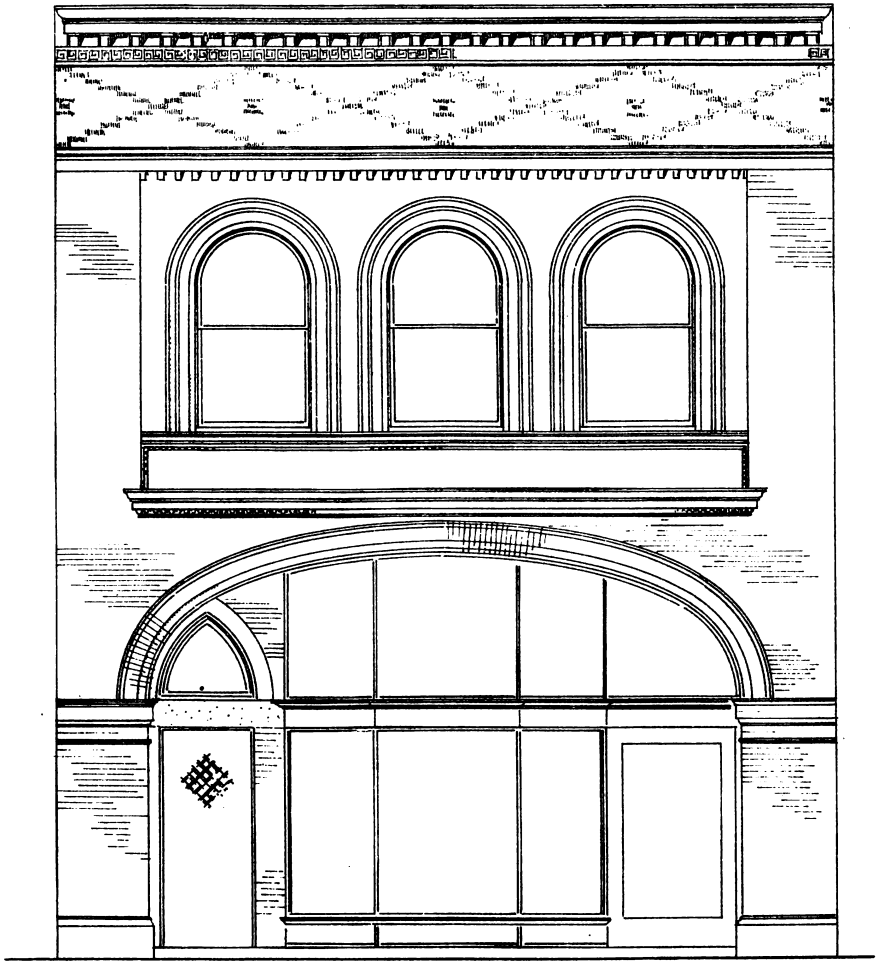
A TWO-STORY STORE FRONT

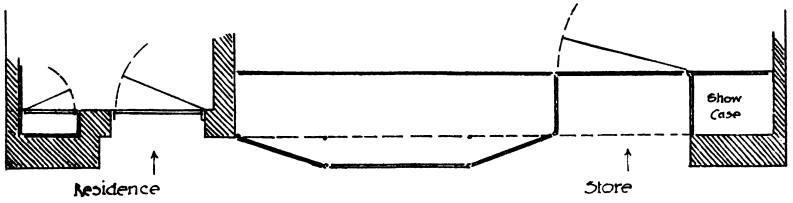
BY

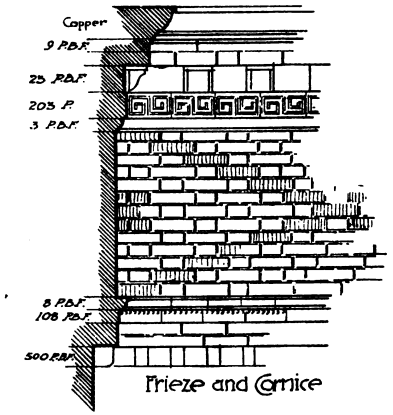
BRICKBAT

BRICKBUILDER COMPETITION, NUMBER TWO.

FIRST PRIZE: RAYMOND F. BOCORSELSKI, HARTFORD, CONN.







Frieze and Cornice

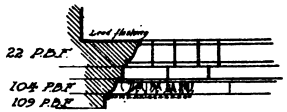
ABBREVIATIONS

P.B.F. Philadelphia and Boston Face Brick Co.

P. Peerless.

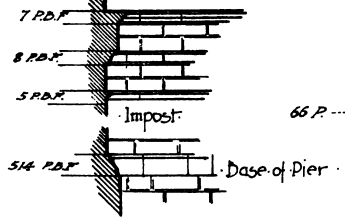
Window Architrave

Sill



Cornice 1st Story

Arch Moulding



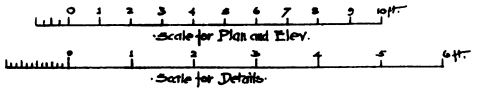
Impost

Base of Pier

Arch Moulding of Door to Residence

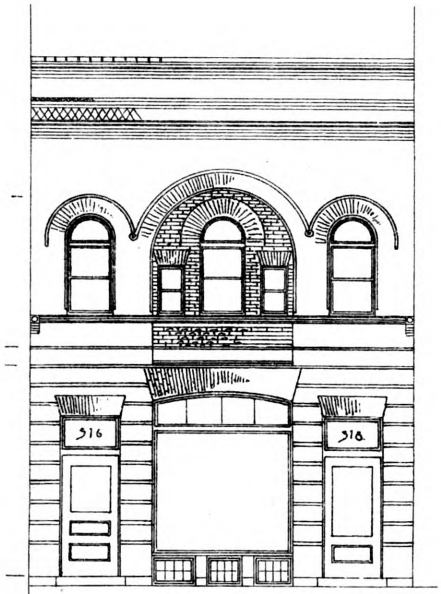
A TWO STORY STORE FRONT

by J.

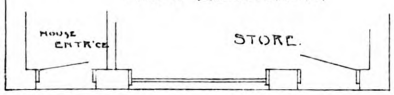


BRICKBUILDER COMPETITION, NUMBER TWO.

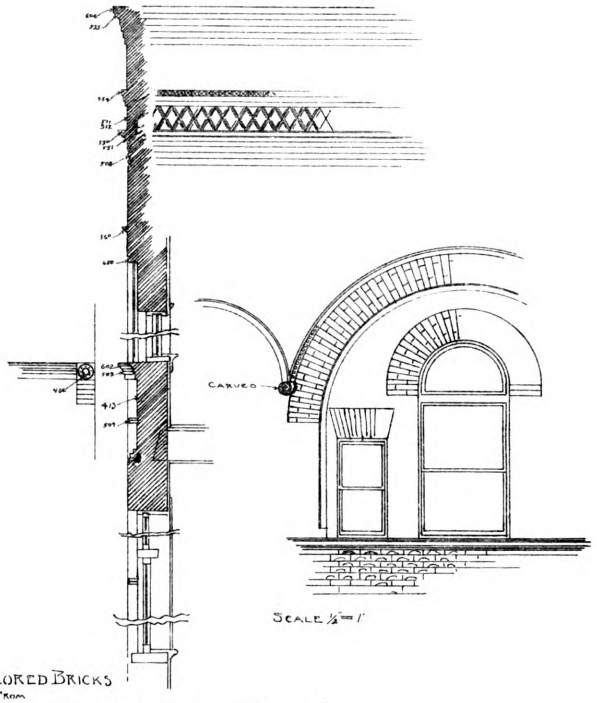
SECOND PRIZE: C. T. MACLAREN, PHILADELPHIA, PA.



FRONT ELEVATION.



SCALE 1/4" = 1'

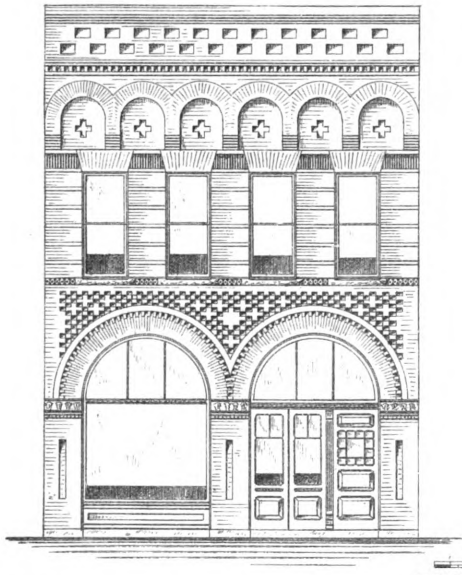


SCALE 1/2" = 1'

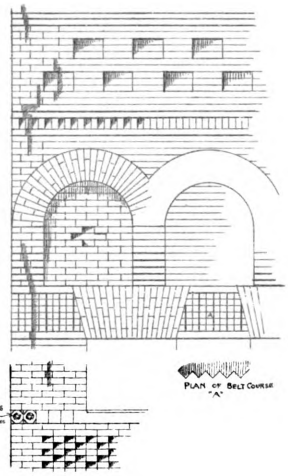
BUFF COLORED BRICKS
FROM
NEW ENGLAND ANDERSON PRESSED BRICK CO.
CATALOGUE OF 1887.

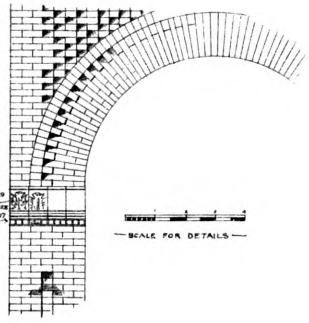
By
NEMO.

THE "BRICKBUILDER"
COMPETITION No 2
SUBMITTED BY
KOKOMO



SCALE FOR ELEVATION

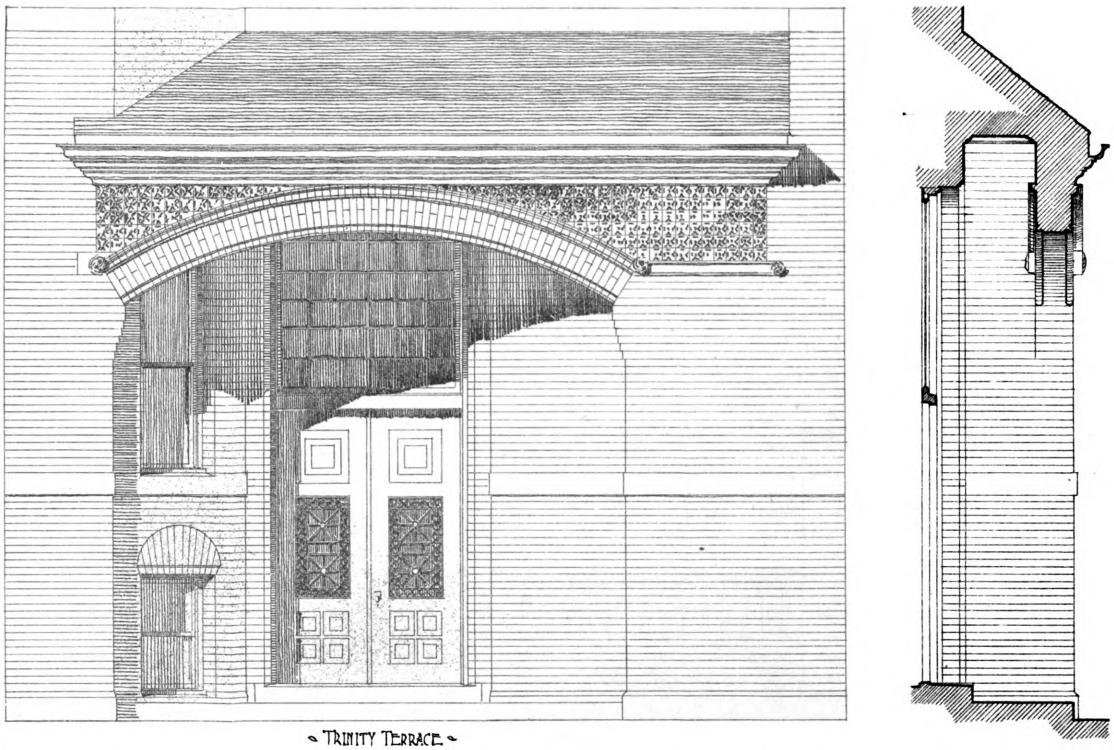




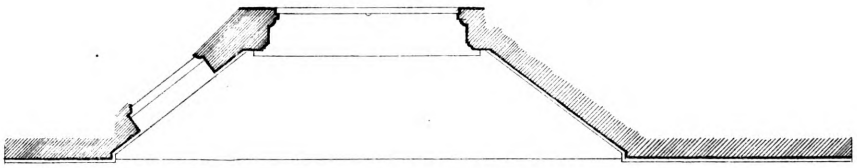
BRICKBUILDER COMPETITION, NUMBER TWO.

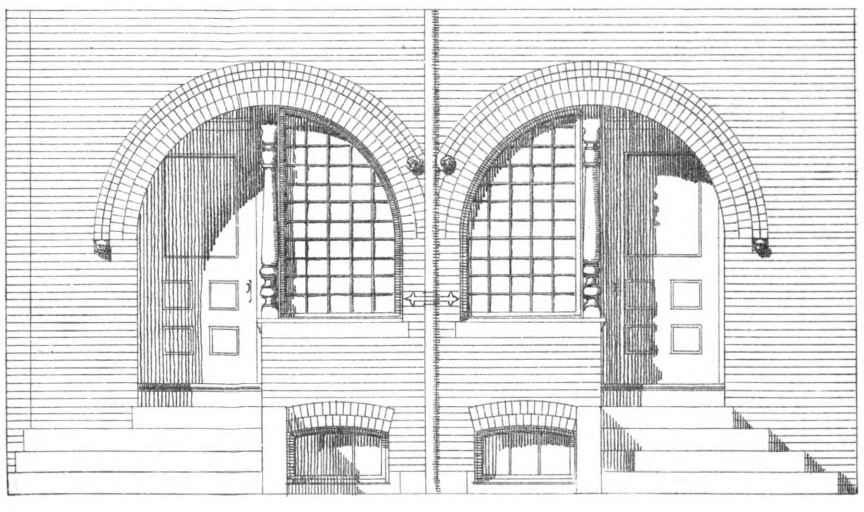
THIRD PRIZE: "NEMO," EDWARD F. CAIRNS, HARTFORD, CONN.

FOURTH PRIZE "KOKOMO," WM. J. PERTZ, KOKOMO, IND.



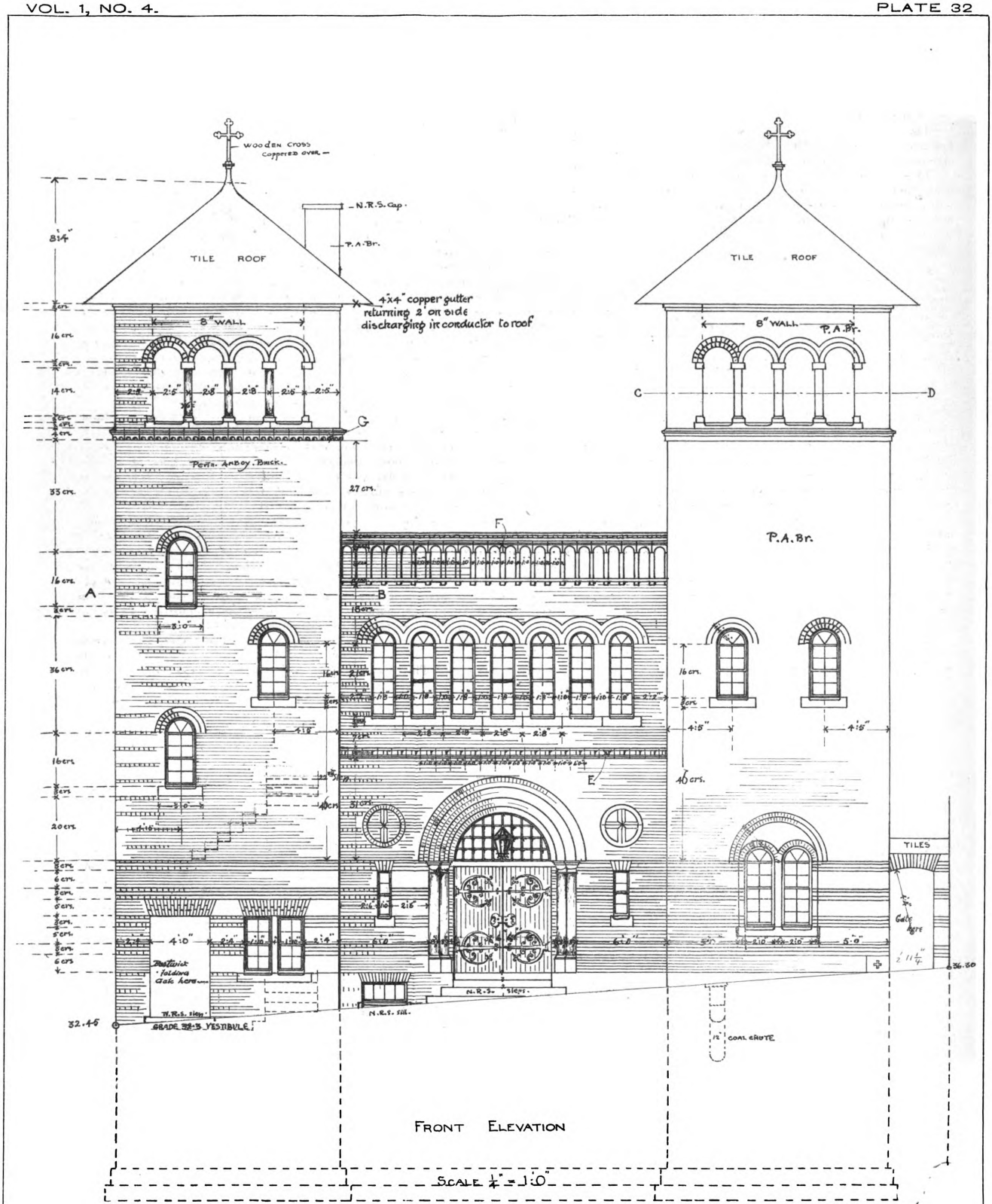
TRINITY TERRACE.





IRVINGTON ST.

SOME BOSTON DOORWAYS.



FRONT ELEVATION

SCALE 1/4" = 1'-0"

ST. AUGUSTINE MISSION CHURCH, BOSTON.

BY STURGIS & CABOT, ARCHITECTS, 19 EXCHANGE PLACE, BOSTON.

are employing, and gain nothing in its place, except, perhaps, a dearly bought economy.

The highest beauty in architecture, as in other branches of the fine arts, is based on truth, expressed in the materials, shown in the construction, and without truth there is no true beauty.

In all these matters I have thus briefly touched upon, we have everything to learn from the past. We shall make more true advance by humbly accepting and studying these past types, than by endeavoring, apart from them, to strive for that ever vanishing "new thing" which has been the bane of much of our work in this country.

R. Clipston Sturgis.

Note. — The student wishing to pursue this subject further and get more full information, is referred to the excellent works of Chabat, "La Brique et La Terre Cuite," Lacroux, "La Brique ordinaire au point de vue décoratif," or still better to the buildings themselves. If the opportunity is not given to study on the spot, Yeendyck's "Documents de L'Arts dans les Pays Bas," gives the best examples in Holland, Sauvageot's "Palais, Châteaux, Hôtels et Maisons de France," contains many of the best French examples. Nash, in his "Mansions of the Olden Times," gives some of the more important English examples, and the best specimens of North Italian work are splendidly represented in Strack's "Ziegelbauwerke des Mittelalters und der Renaissance in Italien."

ORNAMENTAL ARCHES.

Gauged and rubbed brick arches are now employed in a great variety of ways, both for construction and ornament. For plain buildings in which strength is the main consideration, the arch is generally built in separate rings of two or more concentric half-brick arches. Each of these is, as we have said, an independent arch, though sometimes, to secure bond, lacing courses are introduced at intervals. For arches of small span the necessity of building in separate rings is obviously to prevent the great divergence of the bricks that would arise if the bricks were carried from the intrados to the extrados. It will be seen, therefore, that for arches over windows of small radius it is desirable to employ half-brick rings. A brick tapered too much is unsatisfactory in appearance, and this is why, for arches of small span, it is sometimes desirable to increase the radius to make the arch; in fact, a segment instead of a semicircle.

In large, plain arches, where an ornamental effect is desired, and there are no mouldings, the joints are generally made to radiate throughout the whole thickness, but are broken by transverse joints. Thus, for an arch of two bricks in thickness, every other course would show two headers, one at the extrados and one at the intrados, and a whole brick between. The effect is that of English bond in the section of a wall of two bricks.

Only since the revival of brick architectures have architects given much attention to the construction of moulded brick arches, and therefore we find that, for church arcades, stone does duty in the large number of instances, even where brickwork is otherwise introduced into the plain wall surfaces. The improved manufacture of moulded brick and terra-cotta has led a few of the more advanced to step out of the beaten track and employ moulded brick for their arches, carrying out in a more complete and satisfactory manner the idea of brick architecture.

Stone for pillars and arches, and brick for spandrils and walls, are a combination that does not accord with any principle or system of construction. The Romans employed brick, but they used it in arches as well as in walls, in numerous instances; the bricks were used often as a facing, the remainder or backing of the wall being of concrete,— a material that goes with brick even better than with stone.

In North Germany, Belgium, and Italy the brick architecture did not confine itself to walls and surface, but entered largely into complicated details. The moulded arch asserted itself in all the principal buildings. The English examples attest the same thoroughness. Lollard's Tower, Lambeth Palace, Hampton Court Palace, St. Alban's Abbey, Layer-Marney, Essex, and other buildings in the eastern counties exhibit moulded brick archwork. However pleasing the mixture of brick and stone, there are objections to the combination, especially if the stone is in large blocks, and an inequality of settlement arises in consequence. Brick spandrels on stone arches have the same tendency to separate and produce fractures.

Sometimes for ornamental arches bricks are moulded which have geometrical or other devices cast upon them. The result is to form a band of enrichment around the arch which resembles carving. The zigzag or chevron, billet moulding and other Gothic ornaments are sometimes introduced at the angle of the arch bricks, and produce a rich effect. But surface ornamentation can be overdone. The best plan is to introduce it on a part of a face so as to allow a plain face to intervene between one course or band and the next. Few kinds of enrichment are more suitable than the chevron or billet for arches. A plain leaf or geometrical form is more effective than very elaborate patterns.

There is an objection to the use of *moulded* bricks, however, which may be noticed. They would have to be manufactured for every form of arch, as every arch would require bricks of a different mould to suit its curvature and thickness, and this increases the expense and causes delay. On this account few arches are built with purpose-moulded bricks. The ordinary rubbing brick can be adapted by cutting and rubbing to most arches.

There are, however, special circumstances under which the use of moulded arch bricks may be used with advantage, as in a number of arches of a decorative character of the same radius and span, as in an arcade. The cost and labor of cutting and rubbing will here be saved. Again, the ornamental moulded brick affords a comparatively cheap substitute for carved work when many similar arches are required. Another advantage in using moulded arch bricks is that for external work they are harder and more durable than the soft rubbers, which are often of an inferior quality.

The value of the brick impressed with ornament is its suitability for plain arches, as, for example, the voussoirs under an ordinary label moulding. The label brick is required to give character to the arch. Nothing looks commoner or in worse taste than these ornamental bricks set flat with the wall without a label moulding, as we often see over the windows and doors in new houses and tenements. The ornament looks out of place in such a situation. We strongly object to the whole of the brick face being covered by ornament, which should be confined to a part only of the depth. The object of the ornamental arch brick should be to confine the flat ornament to lines or bands in the plain face of the brick. Where it covers the voussoir the idea of an arch is lost, and the appearance of strength and compression ignored. The arch certainly is not the place for ornament of this character, and we prefer the moulded voussoirs for ordinary work, especially the moulded arches.

It would be exceeding the limits of the present article to describe the many notable instances of brick arches of the kind we are describing. The Low Countries, North Germany, and North Italy are the principal countries in which brick architecture has been developed, in any one of which the student will find the art of arch cutting and moulding has been carried to a perfection. Take, for example, the arch work found in such a city as Ypres, in Belgium, and applied not only to archways, but to window-heads and tracery, one or two instances of which we have already given.

The courtyards or cortiles of many Italian palaces, such as that of the Palazzo Bevilacqua, at Bologna, have arcades around them, often of two stories, the arches of which are of red terra-cotta voussoirs, with an ornament on the face and in panelled soffits. Very beautiful examples of Gothic brick arches inclosing three lights of trefoiled arches occur in many of the Venetian and Sienese palaces; at Siena the brick arches of windows in the Palazzo Buonsignori, bands of red and white brickwork are common in the wall surfaces, and we might name the cathedrals of Orvieto and Como, the latter of marble, each having three fine circular-headed and enriched doorways suggestive of the decorative work of this material. Sta. Maria, of Strada, affords another instance of a highly embellished exterior in brick and terra-cotta.— *The Building News.*

A FRENCH VIEW OF AMERICAN BRICKWORK.

La Semaine des Constructeurs, in its issue of April 9, has, under the heading "Technical Notes," an article "How Brick Masonry is done in the United States," which should be of considerable interest to our architects and builders, as giving an outside view of our methods of executing brickwork — or, at any rate, of some of them — for the bad methods of construction *La Semaine* refers to are not all of them as universal with us as that journal would have its readers believe. Still, the description given is, on the whole, accurate, and makes one realize how absurdly, almost inconceivably bad, many of our ways of work must seem to one brought up in the excellent and thorough traditions of workmanship which still largely obtain in the Old World. After a careful description of the ordinary American bricks, pale brick, hard brick, face brick, and due reference to our Pompeiian and mottled bricks, and recognition of the unusually excellent quality of American face brick, the writer in the *Semaine*

goes on to describe and criticise with great justness the methods of work which usually obtain in America. With regard to our common bond of a course of headers, every fifth, seventh, or ninth course, "it will be seen," says *La Semaine*, "that the bond is of the slightest character." In the case of thicker walls the article describes a worse method than is often tolerated in the East, though we have seen it used here in country places, and in the West it is still more frequent, though we believe not as universal as the French critic thinks. "The workman," says *La Semaine*, "builds first a wall half a brick thick on a line with one face of his wall, laying four, six, or eight courses of stretchers. Then, on a line with the other face, another similar and parallel wall. This done, there remains between those two walls a void, which may be, for example, of one brick width if the wall is to be of two bricks thickness. Into this space the mason hurls, with astonishing rapidity, five or six trowelfuls of mortar (the trowel is very large), pours a bucketful of water on top, makes a paste by stirring some instants, throws in with both hands bricks, halfbricks, and brickbats, and arranges them as best he may without loss of time, that is to say, 'hit or miss.' A few more trowels of mortar here and there, a half-bucket of water at need, and the inside of the wall reaches the height of the two faces. The workman then places his heading course and proceeds as before. In some regions the interior of the walls is made by another process not less expeditious. The bricks are laid dry, and every six or eight courses very thin mortar is spread over which runs between the joints and binds the work, more or less. It must not be thought that these practices are only employed for jerry building. They proceed no differently in works of the best class." In this last sentence the writer goes somewhat beyond the facts, but the method is common enough to give cause for the criticism.

"The method of bonding face bricks is not less singular," continues our critic, and then goes on to describe our common and pernicious method. It is with evident surprise and curiosity that the French writer makes the statement, "For the American the face must only show bricks laid as stretchers." What a curious taste these Americans have! he doubtless thinks. Fortunately for us these slipshod methods are gradually coming more and more into disfavor, and as the necessity of substantial work is more and more appreciated, and we build more for the future than for the immediate present, these methods will cease to be characteristic of American work.

NEW ARTICLES.

The publishers wish to announce that they are having prepared several extended articles, by carefully selected writers, that will shortly be published. Some of these will be very fully illustrated by both full-size plates, and blocks in the text. Among the articles will be a study of the principles governing the design of brick cornices, and it will take up successively the different types afforded by the various historical styles, analyze them, and compare them with each other and with the modern examples they have inspired. Measured drawings, sketches, and photographic reproductions will be profusely used to illustrate the matter, which will be divided into several chapters, and published as a serial.

The arch, as an architectural motive, will be treated in much the same general way, by a different author, and in this the combination of brick with terra-cotta will be considered. Considerable attention will be paid to modern examples, and the illustrations will give work from all civilized countries, some of them being published as instances of what *not* to do.

It is the policy of the publishers to secure the very best writers and draughtsmen, and to introduce illustrations in the reading matter, leaving the regular plates for scale drawings of current work and measured drawings of foreign work.

An article upon the manufacture of brick and terra-cotta, prepared for architects, and designed to give them general knowledge while passing by the minute technical details, is being written by one of the oldest, best known, and most successful clay workers in this country. The application of glazes to terra-cotta will also be treated by a specialist, who will go into technical details only so far as they serve to show the architect what results he can expect to get from the processes at command. Correspondence from various cities, illustrated by special sketches and photographs, will also be a feature of later issues; and in this department we expect to keep pace with all that is worthy of special notice in this country and in the large cities of Europe; the illustrations will be added, as the publishers believe that such correspondence is practically worthless without them. Arrangements have been perfected with a skilful photographer, and also a draughtsman, who will go abroad the present summer and collect unpublished material in France, Spain, and Italy, during the fall and winter, together with such data as to history, construction, color, texture, etc., as will make the work useful to our readers. While their work will not be available until the later numbers of the current volume, we feel safe in announcing it as one of the features of this year, and almost the whole of it will be received by subscribers beginning after this date.

"THE BRITISH CLAYWORKER."

A new periodical, devoted to the interests of brick and terra-cotta and tile manufacturers, has appeared in England, *The British Clayworker*, which is devoted entirely to the practical, the manufacturers' side of the subject and covers about the same field that *The Clayworker* so well fills in this country. The articles that appear in its pages are devoted to the various methods of brickmaking and clayworking in different localities, to practical questions of manufacture, trade notes, strikes, etc. The manufacture of bricks by machinery is in England gradually displacing the manufacture by hand, as it has already so largely done in this country. But in England, with its conservatism, its tenacity of traditional methods, the change is coming more slowly than it has with us. *The British Clayworker* promises to be an excellent journal in its sphere. We notice in its pages one statement to which we take decided exception. "Uniformity of color is the ideal of the architect," says *The British Clayworker*. This hallucination of the brick manufacturers has done us a good many bad turns in this country, and is apparently beginning its ravages in England. We do not believe that uniformity of color is the ideal of most English architects; it certainly is not of the leading English architects, who are men of too much taste to desire uniformity of color. Brickmakers in this country are beginning to discover that the better class of architects dislike such uniformity, and the desire for a pleasing variety of color, which has given us the changeful mottled, old gold, brown, and other unusual shades of brick with their great variety of tint, will undoubtedly have its influence on the use of red brick also.

TERRA-COTTA AND STONE.

The *London Building News*, in a comment on these two materials, contains the following: —

"The extensive employment of terra-cotta in the exteriors of buildings ought to leave no doubt in the minds of most people that in the hands of an architect who will have what he wants, and takes some trouble to get the blocks properly made, the material has a future more lasting than stone for our town architecture. The slowness with which the material has fought its way into favor among the profession has been owing to the extreme difficulties encountered in getting it made properly, and the great delay in supplying it. These obstacles to its successful use have now been overcome, as there are a few leading firms who are ready to supply the material with the least delay.

"Every treatment for which stone is employed can be rendered in terra-cotta. Of course there are differences to be observed by the architect in the details, a flatter treatment of the mouldings, avoidance of deep hollows and undercut appearances; but with these exceptions we have buildings displaying as much artistic charm and poetry in this modern material as we have in stone. The natural beauty of stone will, of course, always be recognized where it can be used without danger of quickly perishing; but our street buildings in which the red Mansfield has been used have shown but a very partial record of durability. Nor do we recommend an admixture of stone and terra-cotta in the same building except when architectural or sculpturesque effects have to be produced here and there.

"Ten years ago there were those who advocated the claims of terra-cotta as a material worthy of being employed instead of stone; now these apologists are hardly needed, as stone is becoming almost the exception. The results have been beneficial. Keeping the members down is one of the valued results of the employment of the revived material. When stone was the rule, deep cornices, projecting mouldings, and carved capitals were met with. In a few years the acid laden atmosphere began the work of corrosion, and quickly left the

moulded work a worn and rounded friable surface. Large pieces of the projecting features cracked by the frost and fell away; scarcely an arris was seen in the general crumbling of surfaces. A further result has been that architects have studied the subject of brickwork more than formerly. In the stone dressing days architects designed their stonework very often in supreme indifference to bond; quoins and other features which required range with the courses were often found unable to do so, and repeated objections were made by the bricklayer in setting the stonework of intablatures, arches, weatherings which were made to sizes that did not suit the bond or the convenience of brickwork. Terra-cotta has compelled a more rigid discipline in this respect, and architects who have employed it have learned the value of bonding in its fullest sense, greatly to the progress of the art of brickwork. With regard to cost, the advantage has been on the side of terra-cotta; for although in small specially designed buildings where the material has to be prepared the expense is almost equal to stone, the difference is considerable when there is a repetition of the same moulding or pattern, as an immense amount of labor is saved in all mouldings and ornament. The great drawback is the uncertainty of obtaining the blocks in time for the workmen: when once manufacturers and architects can accommodate each other in this respect, the employment of the material will be doubled."

INTERCOMMUNICATION.

One of the aims which The Brickbuilder proposes to itself is to bring architects and brick manufacturers, as well as brick masons, into closer relationship, and as one means to this end it will open its columns to questions and answers, suggestions and criticisms, on all matters related in any way to the subject matter of the journal, whether practical or aesthetic. This department will be left entirely in the hands of our readers, and its value will depend on the interest they take in it. We have no doubt, however, that such an interest will be taken in it as will insure its great usefulness. We commend the department to architects, brick manufacturers, and brick masons, and urge them to make the freest use of our columns by sending any questions, suggestions, or points of interest which occur to them in the course of their daily practice and work, and as you, reader, whoever you may be, hope to profit by others' answers, we conjure you to reply to any question that may appear here, the answer to which your special knowledge enables you to give.

QUERY NO. 2, MARCH NUMBER. DAMP COURSE.

If "Damp Course," of Bridgeport, Conn., will lay on his brick walls two courses of slates in good Portland cement, with the joints properly lapped, he will have a damp course that will prove effectual and permanent, and be the cheapest, because it's the best.

RIDGWAY, PA. H. JAMES.

THE BRICKBUILDER COMPETITIONS.

The publishers must acknowledge some disappointment in not receiving more designs in the two competitions just closed, and better ones than were submitted. The jury were instructed to award prizes, inasmuch as these designs are apparently conscientious efforts, and the publishers wish to award the competitors for entering the competitions and encourage them to try again and, it is hoped, be more successful, artistically. The programmes are given below and the names of the successful competitors.

COMPETITION NO. 1. AWARD.

AN ARCHED ENTRANCE.

Programme. A fraternal order or society in a large town proposes erecting on a lot of fifty feet frontage on the principal street, a two-story brick building, the ground floor of which will be given up to two stores, and an entrance way and stairs leading to the rooms of the society located on the floor above. The entrance will be in the centre of the façade, and will have an opening no less than six feet wide. The first story will be fourteen feet high from the sidewalk to the top of the girders, carrying the wall over the store show-windows. The line of the second floor will be indicated by an ornamental course directly above the girders. The ground floor will be six inches above the sidewalk. Each store must have a clear space between brick piers, for entrance and show-windows, of at least fifteen feet. The problem is to distribute the brick wall surface into piers and abutments to the arched entrance, and to design this entrance, using bricks of the ordinary size and moulded bricks from any of the catalogues of well-known makers, the catalogue number and maker being indicated in each case.

JUDGMENT IN COMPETITION NO. 1.

The jury cannot forbear to express their disappointment at the character of the work submitted to them for judgment; and certainly it is about time that the attention of the profession was called to the proper use of brick, if this is the best that competition can produce.

The design marked "Tuscan" does not seem to be constructively designed. The panelled pilasters at the sides support partly the mouldings above and partly the hood moulding of the arch, and seem weak and ineffective for so large an opening. The design would have been greatly improved had these meaningless pilasters been entirely omitted. The moulding marked "H," while good enough for general service, does not seem to be suited for voussoirs, and the designer should at least have known sufficient, if he stilted his arch, not to make the members below the centre voussoirs. The general proportions are good, but as a piece of distinctive brickwork designing, it is very meagre.

In the one marked "Piacenza," the general effect of the arch mouldings is good, but the combination of Gothic and classic mouldings is not commendable. The band of ornamental brickwork around and across the head of the door is certainly not constructive. It seems to me that brick on end may occasionally do very well for a small piece of decorative work in panels or string courses, but certainly not in such a position as this.

In regard to both, they seem to us very poor renderings of a design which was distinctively one of brickwork. The joints, which are so important a part of brickwork, are, to a certain extent, disregarded. They should have been fully represented, both the vertical and horizontal showing the bond in which the joint is laid, and on the larger scale drawing should certainly have had double lines showing the width of the joint. The rendering also is poor.

These might, perhaps, answer as working drawings, but certainly are not up to the proper standard for a competition.

Of the designs submitted, the jury place "Tuscan" [I. T. Maclaren, Philadelphia] first and "Piacenza" [W. H. Kilham, Boston] second. First prize, $10; second prize, $7.

COMPETITION NO 2.

A TWO-STORY STORE FRONT.

Programme. The building is to be built between two party walls, on a lot having a frontage of twenty-five feet. The first story will contain a store and the entrance to the floor above which may be used for business offices or as the merchant's residence. The first story will be fourteen feet high in the clear, the other story ten feet. The building will be simple in design and will be built of brick. Moulded brick will be only sparingly used in cornice and strings, and perhaps about the windows and doorway, the catalogue number and maker being in each case indicated.

JUDGMENT IN COMPETITION NO. 2.

The designs submitted for this competition are so meagre that they hardly seem to deserve serious criticism. The jury contents itself with placing the better ones in the following order. The others do not seem worthy of place.

Seven designs were submitted: First prize, $25, Raymond F. Bocorselski, Hartford, Conn.; second prize, $15, I. T. Maclaren, Philadelphia, Pa.; third prize, $8, Edward F. Cairns, Hartford, Conn.; fourth prize, book, Wm. J. Pertz, Kokomo, Ind.

E. M. WHEELWRIGHT,
R. C. STURGIS,
H. L. WARREN,
} *Jury.*

NEW COMPETITIONS.

In spite of the discouraging result of competitions one and two, we have decided to announce two more, and it is earnestly hoped more designers will go in, at least enough to enable us to award the full list of prizes. We have invited criticism from designers in regard to programmes, prizes, time, and rendering, but as no suggestions have been received, we must again depend upon our own judgment. The following are the programmes: —

COMPETITION NO. 3.

THREE CORNICES.

Programme. It is required of the competitor to design three brick cornices, of varying heights. These heights will not exceed seven, thirteen, and twenty ordinary courses, respectively. Bricks on edge will be considered a course. Simple forms are advised, and a skilful use of ordinary bricks will count for more than an elaborate combination of ornamental ones. The gutter will be of terra-cotta or copper, and will be additional. Drawings should be made on a scale of one inch to the foot, and on a basis of five courses to the foot. They must be made upon *hot pressed* Whatman, 9 x 12 inches in size. Each cornice is to be laid out in elevation, seven inches long, the narrowest at the top, with equal spaces separating them, and an outside margin, all around, of one inch. At the right-hand end of each cornice a profile must be indicated. There is to be *no lettering* on the drawings, save the motto or device, which must be placed in the lower right-hand corner, and the initials and catalogue number of the brick company whose patterns are used. The address of the competitor must be sent in a sealed envelope marked with this motto or device.

Drawings must be sent, prepaid, to the Brickbuilder Publishing Co., 4 Liberty Square, Boston, Mass., on or before Aug. 15, 1892.

Awards will be made as follows: First prize, $10; second prize, $7.50; third prize, $5; two fourth prizes, selection of any book in the market published at not over $3.50; four fifth prizes, consisting of subscriptions to current year of THE BRICKBUILDER.

COMPETITION NO. 4.

CHIMNEY TOPS.

Programme. Three chimneys are required for a large country house. These are to be of the same general style so as to harmonize, and are to contain two, three, and four flues, 8 x 12 in size. In designing these chimneys attention must be paid to proper construction and bonding, also to making them as nearly as possible weather proof. To show the bonding, at least three plans must be given, showing joints. Drawings must be made on a 9 x 12 sheet, of hot pressed Whatman, on a scale of one inch to the foot. Each chimney must be given in elevation, showing the upper six feet, with the three plans below it. To secure uniform plates let the top of each chimney be placed one and one half inches from the top of the paper, the smallest chimney to the left. The twelve-inch dimension of the sheet is to be the upright one. Drawings to be delivered at the office of THE BRICKBUILDER on or before Sept. 1, 1892.

Prizes will be the same as in Competition No. 3. The jury will be the same as in the first two competitions.

NOTE. While designers are at liberty to select from the catalogues of any brick manufacturers, they are urged to give preference to the advertising patrons of the paper in whose catalogues almost all patterns will be found.

THE ILLUSTRATIONS.

Plate 25. Some English Moulded Bricks, Redrawn for the BRICKBUILDER from the Catalogue of Messrs. Johnson & Co., Keymer Junction, Sussex, England.

We publish this selection from the catalogue of Messrs. Johnson & Co., thinking it may be of interest to our readers to compare some of the stock mouldings of a well-known English maker with the mouldings which our own brickmakers offer us. In making the comparison the size of the English brick — 9 x 4½ x 3 inches — must be borne in mind; but even apart from this difference, which gives English brick buildings such a different scale from our own, it will be seen that these mouldings are in several respects unlike those to be found, as a rule, in our catalogues. The most striking difference is, of course, in the existence of so many good Gothic mouldings, which are conspicuous by their absence in American catalogues. This dissimilarity is due, of course, to the frequent and generally successful use of the Gothic style in England and the comparatively rare and often unsuccessful use of it in this country, so that there has been but little demand here for Gothic mouldings for our brickmakers to supply. But apart from this — both in the classic and Gothic mouldings given — it will be seen that there are more mouldings in this English collection with small and numerous members than would be found in most American catalogues. Good drip mouldings are few in our catalogues, but there are quite a number in this English collection. It might be interesting and instructive to pursue the comparison further, but we leave this for our readers to do for themselves. Perhaps our brickmakers can obtain some useful hints from these English mouldings.

Plate 26. BRICKBUILDER Competition Number One. First Prize, by I. T. Maclaren, Philadelphia, Pa.

Plate 27. BRICKBUILDER Competition Number One. Second Prize, by W. H. Kilham, Boston, Mass.

Plate 28. BRICKBUILDER Competition Number Two. First Prize, Raymond F. Bocorselski, Hartford, Conn.

Plate 29. BRICKBUILDER Competition Number Two. Second Prize, I. T. Maclaren, Philadelphia, Pa.

Plate 30. BRICKBUILDER Competition Number Two. Third Prize, "Nemo," Edward F. Cairns, Hartford, Conn. Fourth Prize "Kokomo," Wm. J. Pertz, Kokomo, Ind.

We forbear any comment on these competition drawings. The criticism of the jury will be found in another column.

Plate 31. Some Boston Doorways.

These are both simple and appropriate entrances to city residences of moderate cost. The example from Trinity Terrace is by Mr. W. R. Emerson, that from Irvington Street by Messrs. Cabot & Chandler.

Plate 32. St. Augustine Mission Church, Boston, by Messrs. Sturgis & Cabot, Architects, 19 Exchange Place, Boston.

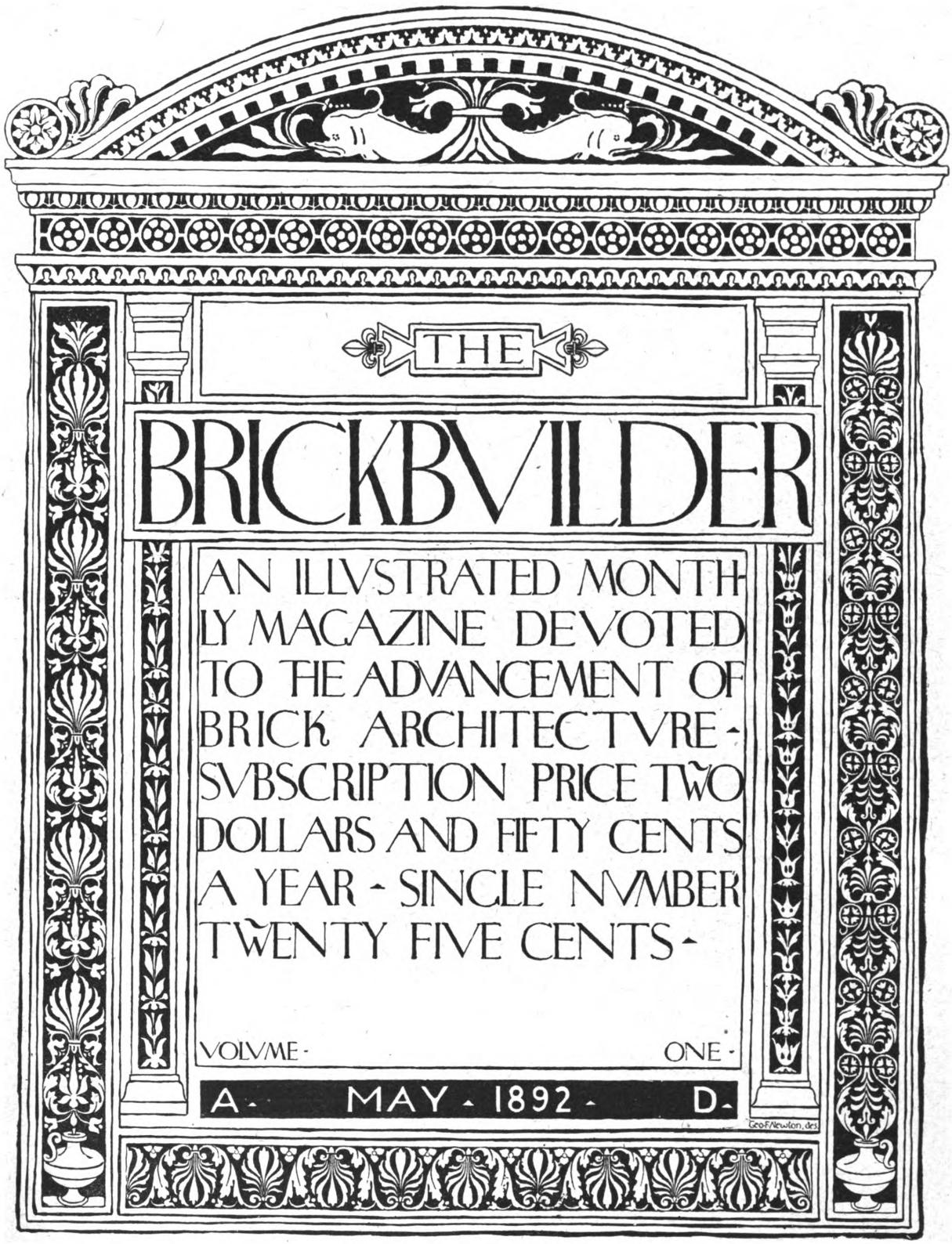
This building seems to us an unusually good instance of excellent and appropriate effect gained by the simplest means. The building is singularly attractive and thoroughly ecclesiastical in its expression. It is built of a gray Perth Amboy brick, with bands of a dark brown brick which form the bond. The towers are roofed with a brown glazed S tile; hardly any moulded brick is used. We cannot help wishing that the capitals of the columns in the doorway had been a little larger; they seem to us to lack height, and to need a deeper abacus. The effect of the capitals at present is a little weak. It would, perhaps, hardly be worth while to call attention to this little defect, were it not the only point we notice that calls for criticism.

Supplement. The Choir of the Church Santa Maria delle Grazie, Milan.

The church of Santa Maria delle Grazie, one of the most interesting monuments of Milan, consists of a Gothic nave, which, with its façade, dates from the fourteenth century, and a choir, transepts, and dome, which were built between 1476 and 1493, and are ascribed to Bramante, and are of especial interest as showing the earlier style of the great architect whose later works in Rome have made his name one of the best known and most justly celebrated in the history of architecture. Bramante, who was Rafael's uncle, was born at Urbino in the year of Brunelleschi's death, 1444 (probably), and came to Milan in 1476 under Giangaleazzo Sforza as engineer (for in those days many of the great architects were engineers, if not also sculptors or painters). He went to Rome before 1500 where he died in 1515.

His early work was influenced, as Burckhardt remarks, both by the rich and luxurious forms of the Renaissance, as seen, for instance, in the façade of the Certosa of Pavia, which was begun in 1473; and also by the beautiful and careful brick architecture of Lombardy, which seems to have made a great impression on him. Both of these influences are visible in the choir and dome of Santa Maria delle Grazie, one of the richest and most beautiful examples of brick and terra-cotta work in Italy. In this work, as Burckhardt well says, the true spirit of the early Renaissance expresses itself with all its graceful boldness. "On a mass of buildings of restricted plan (so that the southern transept shall not encroach on the street), Bramante purposed to erect an important, polygonal, flat dome, with light open gallery. In beautiful and masterly manner he prepares the eye for it. The building, which supports the dome, — the choir and transepts with apsidal terminations, behind which straight walls rise to a higher elevation, — is divided by frames of elegantly interrelated heights into stories of slender proportion." The pilasters, cornices, frames, medallions, and other architectural members are of red terra-cotta with some stone; the detached columns and their caps are of stone; the main mass of the walls and the filling of the panels are of brick.

Burckhardt mistakenly speaks of the architectural members as chiefly stone; a glance at our plate will show the mistake. Prof. Strack's work correctly describes them as being of terra-cotta.



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Boston is certainly to be congratulated on its new building law, the most complete and, on the whole, the most satisfactory law governing the building operations of any city in this country. The commission of three members, viz., Mr. J. G. Stearns, architect, Mr. Wm. H. Sayward, builder, and Mr. Minot, representing the real estate interest, who drafted the act, carefully examined the building laws of the most prominent European and American cities, and after revision by Captain Damrell, Boston's veteran inspector of buildings, and the mayor, Hon. Nathan Matthews, Jr., who has himself given great attention to building matters, the act was finally passed without further modification, and the result is not only a great improvement on the old law, but a law which is likely to be taken as a model by other cities. It was to be foreseen that there would be some points which might be improved; but the law as it stands is doubtless as good as it is possible to obtain in the present state of public opinion in the business community with regard to building matters. The great fires and the exertions of architects and underwriters have already done much towards educating that public opinion; but it will probably be some time yet before what are now regarded as the imperative requirements of business are made so far to yield to the demands of fire resisting construction, as to render possible a still further restriction of the heights of buildings and of the permitted open floor area without fire walls, and a restriction of the window area on narrow streets. We should like to have seen the height of buildings in proportion to the width of streets made less than it is by the present act. But it is much to accomplish the great improvement in this respect required by the new law. We hope, however, the time may come when we shall have a restriction more nearly approaching that of the Paris law which carefully proportions the heights of buildings to the width of streets, and limits the maximum height to twenty meters (65.60 feet) to the top of the cornice. This restriction has the further artistic advantage of giving something like uniformity to the sky line of streets which, with our method of building in slices, is greatly to be desired. The people of Boston may, at any rate, congratulate themselves that there will not be any more Ames buildings. It would have been well, also, could the permitted area of open floor space without fire walls have been further restricted. The London Metropolitan Building Act furnishes the recognized standard in this respect, which restricts the floor space without fire walls to five thousand superficial feet, while the new building law for the city of Boston restricts the area to ten thousand square feet, and this limitation applies only to buildings of the second class. A restriction of floor space should be required in buildings of the first class also. It is to be regretted, too, that the use of wooden standing finish in buildings of the first class could not have been restricted. The most important changes in the law are the establishment of a Board of Appeal from the inspector, the classification of buildings as first, second, and third class, the restriction of the height of all buildings except church spires to a maximum of one hundred and twenty-five feet to the highest point of the roof, the provision that every building over seventy feet high shall be a first-class building, *i. e.*, a building of fireproof construction throughout (under the old building law the limit was eighty feet), the restriction of the heights of buildings to two and one half times the width of the widest street on which they stand, and the provision that all structural iron work shall be protected by terra-cotta or other noncombustible material. There are many other changes all looking to greater substantiality in building; but the above indicates the general lines on which the act is laid down. The section relating to strength of materials (Sect. 19), not content with the general terms of the old aw, gives tables stating the maximum stresses that will be allowed in different materials for various purposes; and the strength and composition of mortars for the various classes of work are accurately specified. The more stringent requirements with regard to second class buildings are greatly to be commended.

Those portions of the act relating to theatres and public buildings, and to tenement houses are especially full and complete, and every building hereafter erected or enlarged for the accommodation of transient guests, and containing more than fifty rooms above the first floor, must be a thoroughly fireproof building.

It may be of interest to our readers if we note more particularly the provisions relating to brickwork and the use of terra-cotta as a fireproof material. The general provisions are similar to those of the old act, viz., Sect. 33. "All brickwork shall be of merchantable well-shaped bricks, well laid and bedded with well-filled joints in mortar," as elsewhere required, "and well flushed up at every course with mortar. Bricks when laid shall be wet or dry as the inspector may direct." The old law provided that "all brick used during the warm months shall be well wet at the time they are laid, and shall be dry at the time they are laid during the cold months." The stresses in tons of two thousand pounds per square foot allowed in brick work are given as follows: First-class work of hard burned bricks and including piers in which height does not exceed six times the least dimensions, laid in

(*a*) One part cement, two parts sand . . .	15
(*b*) one part cement, one part lime and eight parts sand	12
(*c*) lime mortar	8

Brick piers of hard burned bricks, in which height is from six to twelve times the least dimension:

Mortar "a"	13
Mortar "b"	10
Mortar "c"	7

For "light hard" bricks stresses not to exceed two thirds of the above.

Mortar below level of water is required to be no poorer than one part cement and two parts sand. Mortar for first class buildings

must for one half their height be no poorer than one part cement and two parts sand, and above that be of equal parts cement and lime and the proper proportion of sand. For second-class buildings (*i. e.*, buildings not of the first class, the external and party walls of which are of brick, stone, iron, or other equally substantial or incombustible material) the mortar is required to be no poorer than equal parts of lime and cement with a proper proportion of sand.

Sect. 34. "The inside four inches of any wall may, upon a special permit issued by the inspector, be built of hard burnt hollow clay bricks of quality and dimensions satisfactory to the inspector, and thoroughly tied and bonded into the wall."

With regard to bond the new law follows the old and provides (Sect. 35) "that every eighth course at least of a brick wall shall be a heading or bonding course, except where walls are faced with face brick, in which case every eighth course shall be bonded with Flemish headers, or by cutting the corners of the face brick, and putting in diagonal headers behind the same." It is greatly to be regretted that the new law should not have made an improvement in this matter of brick bond; it should have put its veto on our absurd practice of building a facing so slightly attached to its backing, a practice which makes our methods of brick construction the laughing stock of foreign architects and builders brought up under the influence of more thorough traditions. The thicknesses of walls of different heights are carefully specified as in the old law (Sects. 36, 37.) Following also the old law (Sect. 38) "vaulted walls shall contain, exclusive of withes, the same amount of material as is required for solid walls, and the walls on either side of the air space shall be not less than eight inches thick, and shall be securely tied together with ties not more than two feet apart." (Sect. 39.)" In reckoning the thickness of walls, no allowance shall be made for ashlar unless it is eight inches or more thick, in which case the excess over four inches shall be reckoned as part of the thickness of the wall." It would have been well had the act similarly provided that a facing of face brick should also not be reckoned as part of the thickness of the wall unless properly bonded by at least a course of headers every eighth course. A better bond than this it would probably be useless to expect at the present time; but so much as we here suggest should at least have been required.

Sect. 40. External walls may be built in part of iron and steel, "provided that all constructional parts are wholly protected from heat by brick or terra-cotta, or by plastering three quarters of an inch thick with iron furring and wiring."

Sect. 41. "In first and second class buildings all party and bearing walls above the foundation shall be of brick." "All weight bearing metal (Sect. 51) in first and second class buildings hereafter built shall be protected by brick, terra-cotta, or plastering on metal laths and furring, or other incombustible material approved by the Board of Appeal." Sect. 52. "Upright supports in first and second class buildings hereafter erected or altered, of other material than brick below the first floor shall be protected by a jacket of brick or terra-cotta at least four inches thick, or by a coating of plaster one inch thick on wire or metal lathing or other substantial fireproof material." "All cornices hereafter built (Sect. 54) shall be of brick or other incombustible material." Sect. 63 (of firestops) provides that "every second-class building hereafter built, except as hereinafter provided, shall have a sufficient firestop at each floor, covering the whole floor of each story through all stud partitions, and extending to the masonry wall" — "every such firestop shall consist of a solid, air-tight, cohesive layer, at least one inch thick, of tile, brick, terra-cotta, or other firemade material, plaster, cement, cinder or ashes, or of a combination of the same, or of equally non-inflammable non-heat-conducting materials laid between the upper and under floors, or occupying all the space between the timbers under the under floor."

It will be seen from these provisions the great importance that is attached to brick and terra-cotta,— the clay, firemade substances,— as fire resisting materials, and the great value they have in the best modern construction. Especially noteworthy is the provision requiring walls faced with ashlar to be thicker than if all of brick. It is indeed coming to be recognized more and more that brick is on all accounts the most durable of all building materials, and in this age when fireproof construction is becoming of such importance it is likely to be increasingly used. Does not this suggest the importance of giving to this brick and terra-cotta construction an artistic expression appropriate to itself? Does it not suggest that an adequate following in design of the lead given by our new methods of fireproof construction will lead to a form of art in many respects different from any treatment which brick and terra-cotta have yet received? Indeed, we maintain, that there are already ample signs of the development to which we refer. It is to be hoped that our restless desire for something new, our blind following of the lead of fashion, which tend to arrest any wholesome and gradual development, will not nip this new flower in the bud, as they have already so many others. A consistent brick, terra-cotta, and tile construction, such as that to which our new methods of fireproof building point, differs so widely from previous methods of construction, that it must lead to new artistic forms, if it receives any adequate and harmonious artistic treatment. But this new development cannot be hurried. If it is forced it will be destroyed. A development to be of any value must be gradual and natural. It is our misfortune to live in a self-conscious age which makes natural processes difficult. We are constantly digging up the seed that is in the ground to see how it is getting on. Let us be on our guard against this error, and while striving to make the best use of the wealth of material now at our command, let us be sure and use them in a natural and logical way, and let our treatment of any design be always suggested by the conditions of the problem in hand, and by the constructional system adopted.

There is one provision of the new law which is likely to have more far-reaching consequences than might at first thought appear, and cannot but result ultimately in still further improvement of the building regulations of Boston. We refer to the creation by the new act of a Board of Appeal. Sect. 12 reads, "There shall be in said Boston a board, to be called the Board of Appeal from the Inspector of Buildings, which board shall consist of three members to be appointed as follows: One person, who shall be appointed by the mayor with the approval of the Board of Aldermen, and who shall hold his office for three years from the date of his appointment. One architect, who shall be appointed with the approval of the mayor by the Boston Chapter of the American Society of Architects, such appointment being duly certified by the proper recording officer of said chapter, and who shall hold his office for two years from the date of his appointment. One master builder, who shall be appointed with the approval of the mayor by the Master Builders' Association, such appointment being duly certified by the proper recording officer of such association, and who shall hold his office for one year from the date of his appointment. The terms of the several members of said board shall be three years each after the expiration of the first terms." The rest of the section relates to compensation, removal, absence, etc. Sect. 13 provides that any person to whom permit has been refused or an order issued involving expense may, within fifteen days, appeal from the decision of the inspector to the Board of Appeal. Undoubtedly by "American Society of Architects" the American Institute of Architects is intended, as no national body calling itself "American Society of Architects" exists. It is a pity that this inaccuracy should have

been allowed to creep in. But it will undoubtedly not be permitted to affect the working of the act.

The importance of this Board of Appeal is greater than the mere provisions of the act itself might seem to indicate. Not only will its existence give stability to the inspector's decisions and secure him from any accusations of partiality or want of judgment, and thereby greatly strengthen his hands, but the decisions as they come to be made by the board will give a body of precedents somewhat similar to those of the courts, making the execution of the law consistent and impartial. Further than that the Board of Appeal will inevitably become the recognized custodian of the law, and any recommendation they may make for its modification or improvement will come with a weight of authority hardly to be resisted without good reason. It is hard to conceive of any further changes being made in the law without the recommendation or the sanction of the Board of Appeal. It will have had the experience in watching closely the execution of the law and its effects, and legislators can hardly avoid looking to it to recommend any changes for its improvement, which its actual workings and further constructional development and experience may in future seem to require.

The excellent design for a brick church by Mr. J. A. Van Straaten, Jr., which we publish in this number, and of which a detailed description will be found in another column, we commend to our readers as a striking example of how much can be accomplished with perfectly simple means. Indeed it is its simplicity and restraint which gives this design its greatest value. As stated in the description, and as will be seen by a careful examination of the drawings themselves, in spite of the elaborateness of effect, a single form of moulding, and that a very simple one, is used throughout, except in the cornices, sills, and water tables where there are two or three more patterns. Apart from some of the large starters in the traceried windows, not a half dozen separate brick moulds would be required to build this large church with all its variety of architectural form. The general plan followed has been that of the traditional cruciform church; but the forms here shown could easily be adapted to other plans and simpler requirements. The mass of the building is at once dignified and graceful, and the perspective effect would be most imposing. The design of the tower seems to us especially happy in its simple and massive proportions and its richness of effect with simple and appropriate detail. Pure Gothic throughout, it is also distinctively a brick building, its forms being thoroughly appropriate to the material used. Whether using the traditional cruciform plan, as in this design, or with a simple nave, or with the auditorium plan of some modern churches, there is no doubt that our church architecture would be vastly more satisfactory than it is, if it were content to follow the admirable precedents of the olden times, especially of Gothic times, instead of chasing the Will-o'-the-wisp of originality, which has led our church architecture especially into all sorts of miserable quagmires, and which places eccentricity instead of excellence as its ideal. It would be easy to enrich the design here given by ornamentation in terra-cotta in the cornices, the archivolts, or the caps of the piers; but the simpler forms make the design more easily adaptable to other conditions; and in any case the addition of ornament is not to be recommended unless that ornament can have the highest artistic excellence. Absolute plainness is preferable to elaborate decoration, unless it has in itself real artistic value, and is treated with a delicate feeling of appropriateness to the place it is to occupy.

The receipt from time to time of inquiries regarding the lateness of publication of THE BRICKBUILDER, leads the publishers to again make an explanation, which it is hoped will clear our readers' minds.

The paper was undertaken in the fall of last year, but the business was not organized until January of this year. A partial canvass among architects apparently showed a large amount of available material, but when it came to the actual securing of the drawings, many were found impracticable and many needed redrawing to fit them for reproduction by process or lithography. It had been decided to date the first number January, in order to have the volume begin with the year, and as that number was expected to be out in February, the publishers were confident that the lost time could be regained in two or three issues. As a matter of fact, unavoidable delays held the initial number over into March, and the additional time thus lost it has been found difficult to regain without some sacrifice of quality in the material published. While not losing time in the issue of the numbers thus far published, it must be candidly admitted that no time has been gained, but with the work of preparing current numbers, much has been accomplished towards securing the best of material for the future, and with this in hand, the remaining numbers will appear at intervals of about three weeks, thus gradually closing up the present gap between dates of the numbers and actual dates of issue. It would be an easy matter to fill our paper, should we resort to the methods in vogue among many class journals of devoting a generous amount of space to the publication of "puffs" of various manufactured articles, contributed by the makers who seek this sort of advertisement; but it is a question with us whether our subscribers wish to pay for this matter. We do not wish it understood, however, that we intend to ignore the manufacturers and the many advances they are constantly making, but we intend to look at everything published with a view to its interest or usefulness to subscribers. In this way can THE BRICKBUILDER best advance the interests of both classes of its patrons.

The fifth number of *The Architectural Review* is one of unusual interest, and might certainly be referred to as a brick and terra-cotta number. It contains a beautiful series of drawings of the Madison Square Garden, New York, by McKim, Mead & White, redrawn for the *Review* by Harold Magonigle from the architects' working drawings, showing the general elevation of the tower and the Madison Avenue front, with details to a large scale of the top of the tower, the corner pavilions, the entrance arcade, and the central motive of the Madison Avenue front. The drawings are executed with great care, and are models of what such drawings should be. As our readers well know, this magnificent monument is executed in yellow brick and white terra-cotta, and those who have seen it can testify that no material could be better in which to execute rich and elaborate detail than this crisp, delicate gray-white terra-cotta. The *Review* editorially has a judicious critique of this building. In addition to the drawings of the Madison Square Garden is a detail of the gable, also in brick and terra-cotta, of the New York Life Insurance Building, in St. Paul, by Babb, Cook & Willard, of New York, taken directly from the architects' drawing. Not many architects, we believe, make such beautifully finished and careful working drawings as this.

The attention of non-subscribers is respectfully called to the announcement on the inside back cover of this number of THE BRICKBUILDER. Their subscriptions are solicited for a trial year, and may begin with any number. For those who wish the paper from the beginning, we have reserved a number of copies of each number published, and these will be supplied at the regular subscription price. Those receiving rolled copies should remember that to all *subscribers* the paper is sent *flat*, well protected from injury in the mails.

CLAY BUILDING MATERIAL.

Clay working in all its varied forms has received in this country within the past quarter-century a great impetus. In no one of the mechanic arts has there been greater progress. This applies not only to the quantity of the production, but also to the character and scope of the material produced. A generation ago the short sentence, "a brick is a brick," would have told very nearly the whole story. Then the common red brick, with a small proportion repressed by hand for the better fronts, or for fireplace work, was about all from which the architect could choose. Indeed, so meagre was the supply then, and so rapid has been the development since, that probably many of our architects are scarcely aware of all the opportunities afforded them by the material as it is found in the market to-day. It can no longer be said that "a brick is a brick." Men of brains, of education, of enterprise, as well as of capital, are making clay working their life study, until out of the ground at our feet have sprung such forms and colors of clay building material as may well cause the student of the time to exclaim, as one of them lately has, "Surely, are we not approaching the age of clay?"

Every architect knows, in a general way, what is meant by common brick, pressed brick, fireproofing, architectural terra-cotta, floor tiles, roof and ceiling tiles. But is a "general idea" enough to enable the architect to use the material to the best advantage? May he not find in the following facts something which will be of value to him?

There are three specific methods in use by brickmakers, viz., the soft clay, the stiff clay, and the dry or semi-dry process.

The soft-clay process is the most ancient, and, so far as producing the best all-around results is concerned, is unquestionably the best. It consists of applying sufficient water to the mixture to thoroughly saturate and separate the parts, driving, practically, all air therefrom, and uniting the mixture in one homogeneous mass. The water is then dried out, causing the maximum of shrinkage, and leaving the brick in the best possible condition for burning. I will venture the assertion, that in the case of a soft-clay brick of proper mixture, hand made it may be, the drying process, which will cause it to shrink about eight per cent, is as beneficial in the direction of producing a good brick as any pressing, either by hand or power press.

It will be seen that this process is necessarily a slow and expensive one, on account of the time required to evaporate the water, which cannot be hurried beyond a certain degree, or the bricks will crack. It is, therefore, not a popular method with clay workers, especially where large quantities of the higher grade brick are produced, for in these days of *rush* and drive, and close competition, no process which is slow will meet with general favor. John Jones must save time and expense, even though it be at the sacrifice of quality, in order to undersell John Smith.

The stiff-clay process is a step in the direction of saving time and expense of handling and drying. It differs from the former only in the application of less water, and the bricks can thus be taken direct from the machine, repressed, and placed on the trucks for drying in the artificial dryer, which process requires only ten to twenty hours.

Time is thus saved at some cost of additional power, as the mixture being stiff is more difficult to manipulate. There is also a danger that the mixture will not receive that thorough "kneading" which is necessary for the best results.

The dry or semi-dry process differs radically from the two former. Instead of the application of water to the mixture, that element is eliminated as largely as possible from the very first. The clay is used dry, and the bricks formed by somewhat complicated, but very powerful, machines under such an enormous pressure (say forty tons to a brick) that the mixture is driven together in such a solid mass that it can be placed in the kiln direct from the machine and fired at once. This method of manufacture is *quick*, and less expensive than that where water is used, and is, therefore, popular where large quantities of brick are produced. It produces the most *mechanically* perfect brick, *i. e.*, straight, smooth, clean cut, and, *if vitrified in burning*, in other respects also a good brick.

There is vast significance to any student of this subject in the contemplation of the illustrations of the three kinds of *machines* used in the three processes above described, as they appear in the advertisements of their makers in such journals as *The Clay Worker* and *The Brickmaker*.

As "there are sermons in stones," so also there is a significant story in the market quotations for bricks, from the common red brick, at say $5 per thousand at the kiln, to the terra-cotta bricks of fancy color at $45 or $50 per thousand. The impression of the novice is that there is an enormous profit in the latter. This, however, does not follow. The careful selection of clays, the accurate measuring of the same for right proportions, the preparing of a quantity of pulverized burnt clay or "grog," the expensive machinery, the amount of power required in the very thorough manipulation of the clay, the skilled labor employed, and the risk and loss in producing the desired color, go a long way toward filling the gap between $5 and $50.

No art is brought to its highest perfection without some failures, and the wrecks of the numerous clay-working establishments "whose bones are whitening on the fields" in almost every State of the Union, while indicating individual failures, also indicate that American enterprise has taken hold of this industry in earnest, and in spite of some failures will carry it to its highest possibilities. We have already outstripped our English cousins, not only in the variety and scope of our machinery for working clay, but also in the quality of our production.

Another field new (for us) and intensely interesting is opening up before us, viz., the glazing and enamelling of terra-cotta for exterior and interior decoration. Enough has already been accomplished in this line to suggest its possibilities, and the near future is quite likely to bring some surprising developments.

Sketches and plans are already drawn for a seaside cottage with two floors, to be built entirely of clay material. Nothing else is to be used except the wooden window frames and doors, and possibly some of the floors and a few iron tie rods. The second floor is to be supported by the Guastavino arch, which will also form the ceiling.

With some twenty colors or shades of colors as now produced in clay material, together with colored glazes, it will be readily seen that some fine effects can be produced, and that, too, at a comparatively low cost. But the highest development of clay building materials depends upon the architect. The clay worker does his bidding. This is well illustrated in the fact that some fifty years ago an architectural terra-cotta works was started at Worcester, Mass. The production was of first-class quality. In the West Arch Street Presbyterian Church of Philadelphia are some capitals made by the Worcester company, and put in place forty-four years ago. In making an alteration in the church these capitals have been taken out and reset, and are as good to-day as ever. The pinnacle of the First Unitarian Church, Charlestown, North Carolina, was made in terra-cotta by the same parties, and was struck by lightning and shaken down at the time of the earthquake in 1885. I have a piece of it in my office. It is of excellent stock. But the architects of that day evidently did not appreciate the material, and the industry died for want of patronage.

Architectural terra-cotta requires the most carefully prepared mixture of any clay building material, the soft clay process, of course, being used. This special manipulation of the clay, together with a good proportion of pulverized burned material and, an expensive chemical to kill the efflorescence, increases the cost very largely; but the production itself, when properly burned, *is the ideal building material*, not only in strength and durability, but in a greater variety of texture, finish, and color than can be found in any other.

Where can the architect find a material which presents to him a greater variety, or with which he can better express his ideas of form and color?

> "Not fashioned out of gold like Hero's throne,
> Not forged of iron like the thunderbolts
> Of Zeus omnipotent, or like other works
> Wrought by my hands at Lemos or Olympus,
> But moulded in soft clay, that unresisting
> Yields itself to the touch, this lovely form
> Before me stands, perfect in every part."
>
> GEORGE M. FISKE.

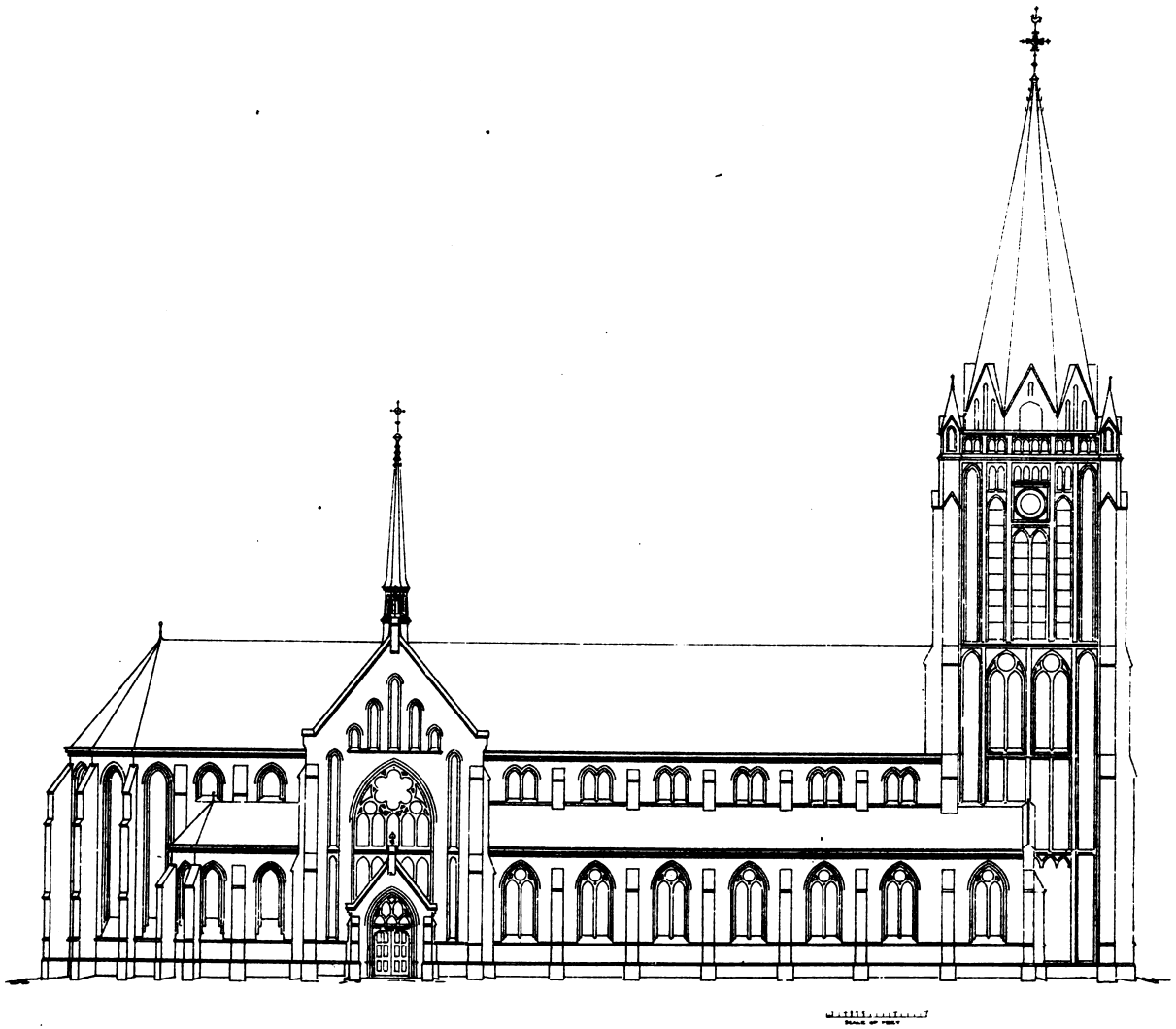
It has been so long the custom to have statues of bronze, for mere durability, that the use of any other material for monuments that are exposed to the weather has not been suggested; nevertheless it must be an acknowledged fact that dark sculpture is not as attractive as light, and that if it were possible to obtain results with a material of the character of Della Robbia ware, for instance, there would be a distinct gain in the effect. With the renewed use of terra-cotta, it may be possible in the future to supplant bronze in many places.—*The Architectural Review.*

SUPPLEMENT TO THE BRICKBUILDER.

MAY, 1892.

CHURCH OF S. MARIA DELLE GRAZIE, MILAN.

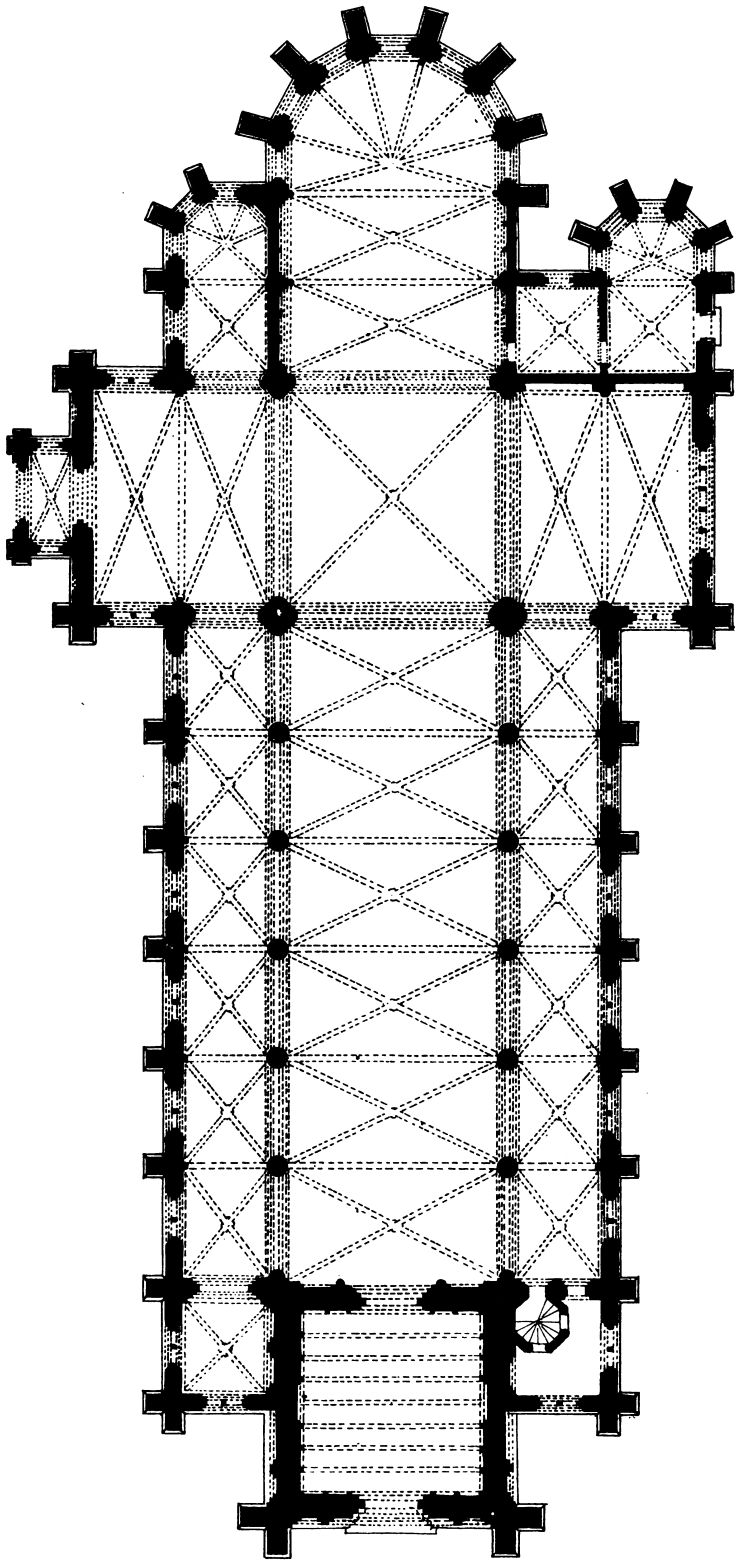
Third of a Series of Photographs of Foreign Brickwork.



Forbes Co.

LONGITUDINAL ELEVATION.

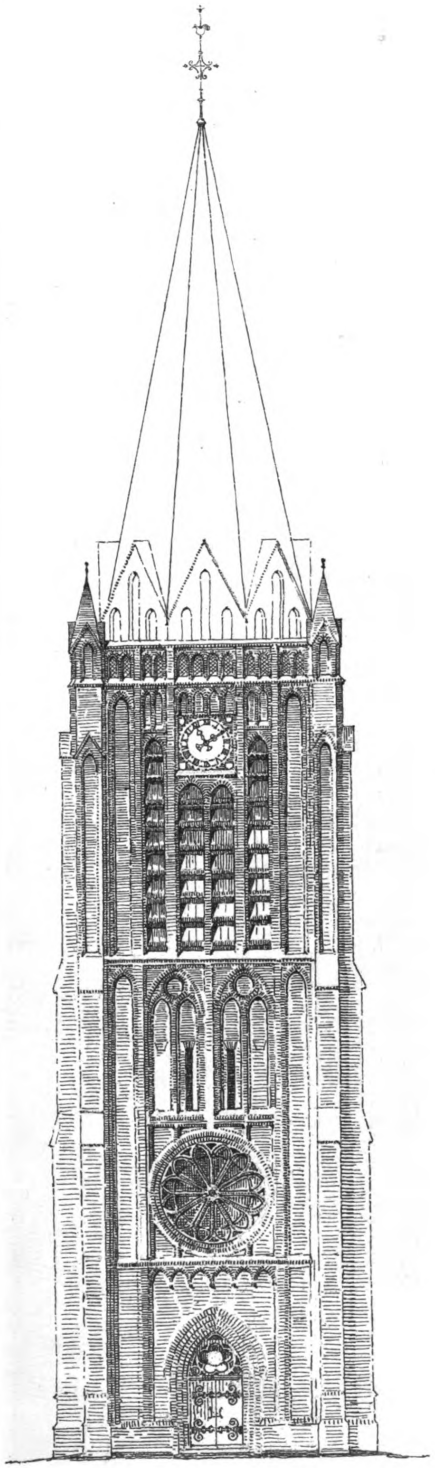
THE BRICKBUILDER DESIGN FOR A CHURCH.

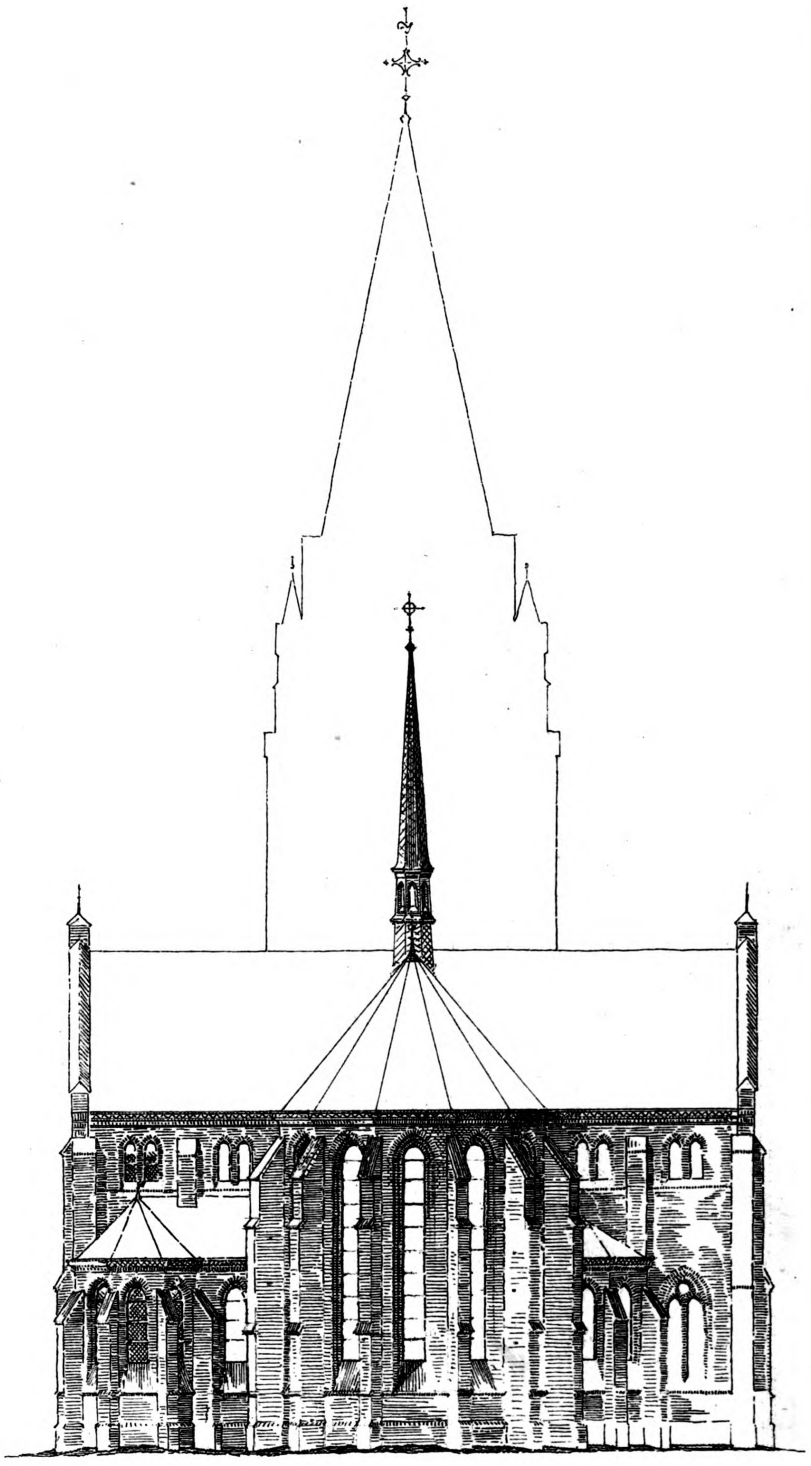


PLAN.

THE BRICKBUILDER DESIGN FOR A CHURCH.

J. A. VAN STRAATEN, JR., DESIGNER, BOSTON.





ELEVATION OF TOWER. ELEVATION OF APSE.

THE BRICKBUILDER DESIGN FOR A CHURCH.

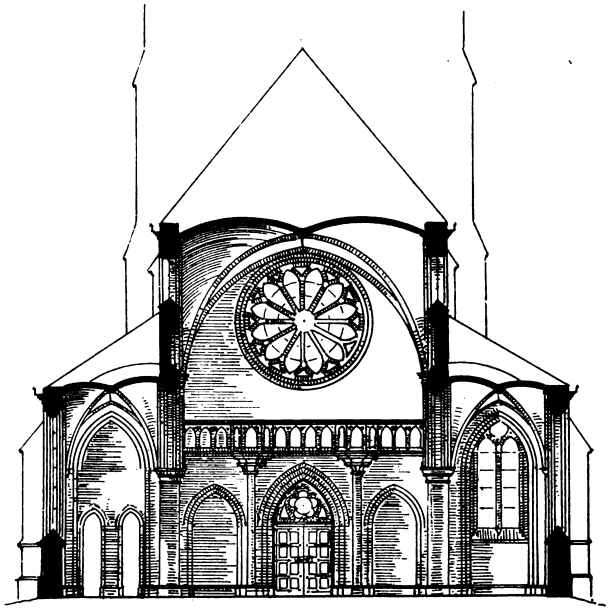
I. A. VAN STRAATEN, JR., DESIGNER. BOSTON.

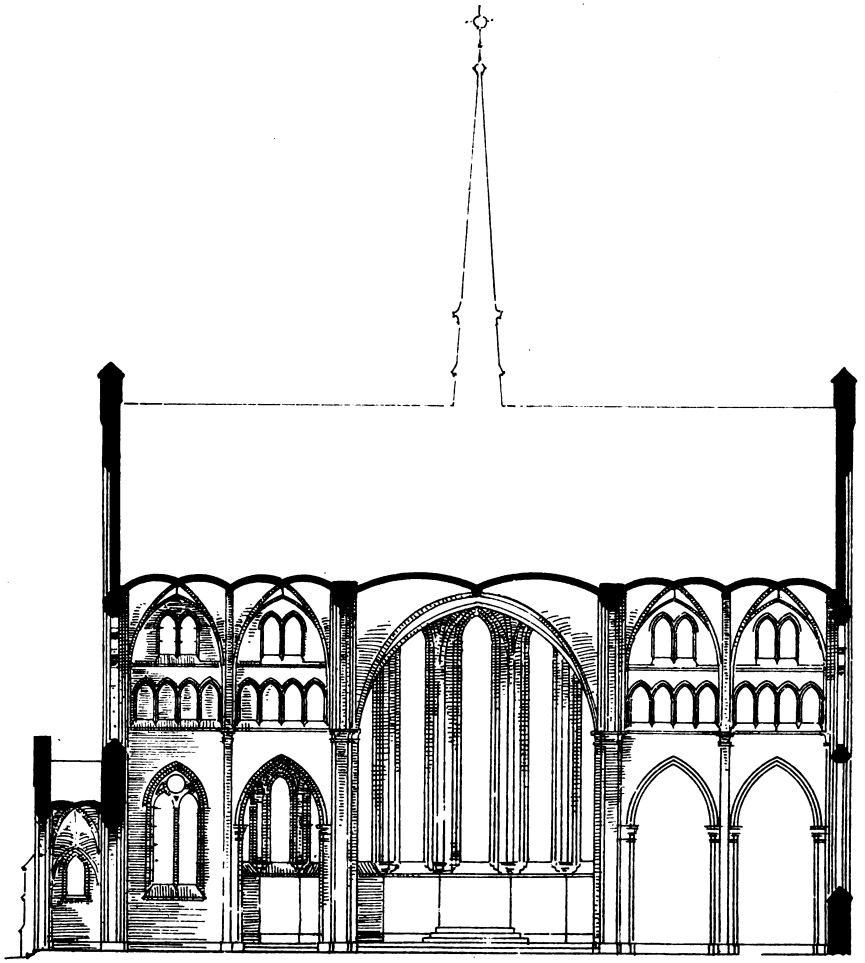
½ SCALE VIEW OF TRANSEPT GABLE.

SCALE OF FEET

THE BRICKBUILDER DESIGN FOR A CHURCH.

I. A. VAN STRAATEN, JR., DESIGNER, BOSTON.



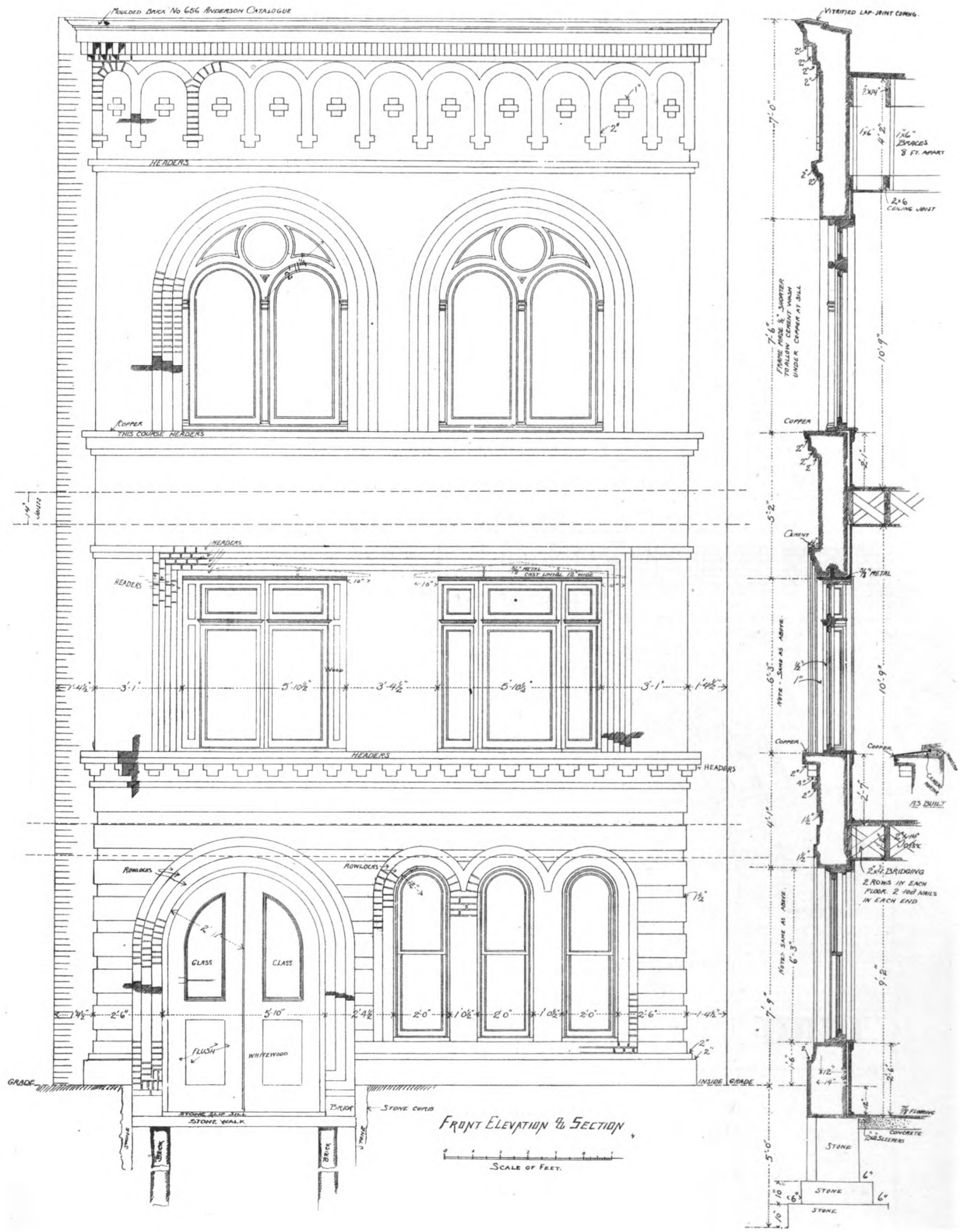


SCALE OF FEET

TRANSVERSE SECTION.

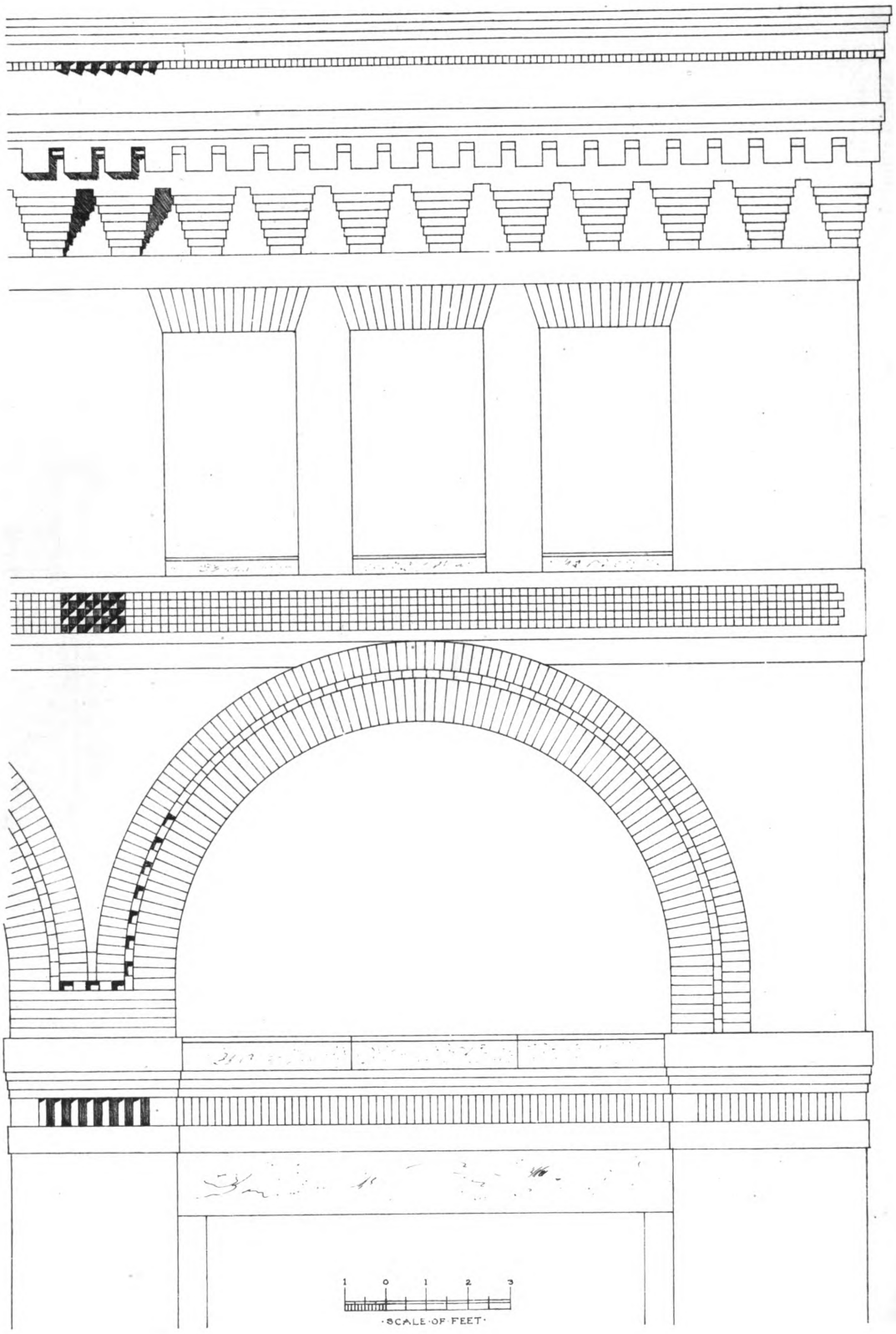
SECTION THROUGH TRANSEPT.

THE BRICKBUILDER DESIGN FOR A CHURCH.



BUILDING FOR THE GIRLS' MUTUAL BENEFIT CLUB, CHICAGO.

JENNEY, MUNDIE & WAID, ARCHITECTS.



DETAIL OF BUILDING CORNER CONGRESS AND PURCHASE STREETS, BOSTON.

CABOT, EVERETT & MEAD, ARCHITECTS.

BRICKS AND BRICKWORK.

A Lecture delivered at Carpenter's Hall, London, by Prof. T. Roger Smith, F. R. I. B. A.

Timber, stone, earth, are the three materials most used by the builder in all parts of the world. Where timber is very plentiful, as in Norway or Switzerland, it is freely used, even though other materials are obtainable, and seems to be preferred, notwithstanding the risk of fire which attends its use. Where timber is scarce, and stone can be had, houses are built of stone. Where there is no timber and no stone, they are built of earth, sometimes in its natural state, sometimes made into bricks and sun-dried, but more often made into bricks and burned. London is one of the places that occupy a spot which has long ceased to yield timber, and yields no stone, so we fall back on earth burnt into the form of bricks. Brick was employed in remote antiquity. The Egyptians, who were great and skilful builders, used it sometimes; and, as we know from the Book of Exodus, they employed the forced labor of the captives or tributaries whom they had in their power in the hard task of brick-making; and some of their brick-built granaries and stores have been recently discovered near the site of the battle of Tel-el-Kebir. The Assyrians and Babylonians made almost exclusive use of brickwork in erecting the vast piles of buildings, the shapeless ruins of which mark the site of ancient Nineveh and of the cities of the valley of the Euphrates. Their bricks, it is believed, were entirely sun-dried, not burnt to fuse or vitrify them as ours are, and they have consequently crumbled into mere mounds. The Assyrians also used fine clay tablets, baked in the fire, in fact, a kind of terra-cotta, for the purpose of records, covering these tablets with beautifully executed inscriptions, made with a pointed instrument while the clay was soft, and rendered permanent by burning. We don't know much about Greek brickwork; but it is probable that very little brick, if any, was made or used in any part of Greece, as stone, marble, and timber abound there; but the Romans made bricks everywhere and used them constantly. They were fond of mixing two or more materials together, as, for example, building walls in concrete and inserting brickwork at intervals in horizontal layers to act as courses of bond. They also erected buildings of which the walls were wholly of brick. They turned arches of wide span in brickwork; and they frequently laid in their walls at regular distances apart courses of brick on edge, and courses of sloping bricks, to which antiquaries have given the name of herringbone work.

The Roman bricks are interesting as records, for it was customary to employ the soldiers on brickmaking, and to stamp the bricks with names and dates; and thus the Roman bricks found in this country give us some information as to the military commanders and legions occupying different parts of England at different periods.

Flue bricks for the passage of smoke under floors and in other situations are sometimes found. The Roman brick was often flat and large,— in fact, more like our common paving tiles known as foot-tiles, only of larger size, than like the bricks that we use. They vary, however, in size, shape, and thickness. Not a few of them are triangular in shape, and these are mostly employed as a sort of facing to concrete work, the point of the triangle being imbedded in the concrete and the broad base appearing outside. After the Roman time, brickmaking seems to have almost ceased in England for many centuries. It is true, we find remains of a certain number of massive brick buildings erected not long after the Norman Conquest; but on examination it turns out that these were put up at places where there had been a Roman town, and were built of Roman bricks, obtained by pulling down previous buildings.

The oldest parts of St. Alban's Abbey, and portions of the old Norman buildings at Colchester, are examples of this sort. Apparently timber was used in this country almost exclusively for humble buildings down to the sixteenth century. This is not surprising, considering how well wooded England was; but stone served during the same period for important buildings almost to the exclusion of brick. This is more remarkable as we find stone churches and the ruins of stone castles in not a few spots remote from stone quarries, and to which the stone must have been laboriously conveyed at a time when roads were very bad and wheel-carts were scarce.

About the time of the Tudors, say the reign of Queen Elizabeth, the making of bricks was resumed in England, and many dwelling-houses and some few churches were built of good brickwork in that and succeeding reigns. We find in such buildings as Hampton Court Palace, St. James's Palace, and Chelsea Hospital examples of the use of brickwork in important buildings near London at later dates.

The fire of London in 1666 gave a sudden check to the use of timber in house building in the metropolis. Previous to that date the majority of houses had been of a sort the most ornamental examples of which were copied in "Old London" at the Colonial Exhibition. The rebuilding after the fire was largely in brick; and in the suburbs, in the latter part of the seventeenth and eighteenth centuries, many dignified square brick mansions, with bold, overhanging eaves and high roofs and carved ornament, entered through a pair of florid wrought-iron high gates, were built, some few of which still linger in Hampstead and other suburbs. The war time at the beginning of this century was a trying time for builders, with its high prices and heavy taxes, and some of the good-looking brick buildings of that day turn out to have been very badly built when they are pulled about for alterations. With the rapid and wonderful increase in population and wealth in this metropolis during the last fifty years, a vast consumption of brick has taken place, and a year or two back it was reported by the commissioners of police that the extensions of London equalled in a year seventy miles of new house property practically all of brick.

Bricks were heavily taxed in the war time which I have referred to, and the tax was levied before burning. There was a maximum size for the raw brick, which, it was supposed, served to keep bricks uniform, and the expectation was entertained that when the duty came off, many fancy sizes of bricks would be used. This has not, however, turned out to be the case. The duty has been entirely taken off for years; but the differences in the size of bricks in England are little more than what is due to the different rate of shrinkage of brick-earth under burning. It must not, however, be supposed that they have always, and in all countries, been of about the same dimensions. The size and proportions of bricks have varied extremely in different countries, and in the same country at different periods. Some bricks of unusual shapes have also been employed from time to time. Other countries besides England possess districts which from various circumstances have been, more or less, densely built on, but do not yield much stone or timber; and, accordingly, brickwork is to be met with in many localities. Holland and Belgium, for example, are countries of this sort; and the old connection between Holland and England led to the introduction among us, in the reign of William III., of the Dutch style of building, which has been in our own day revived under the rather incorrect title of Queen Anne architecture. Another great brick district exists on the plains of Lombardy and the northern part of Italy generally, and beautiful brickwork, often with enrichments in marble, is to be found in such cities as Milan, Pavia, Cremona, and Bologna. Many cities and towns in Northern Germany are also brick built, and furnish good examples of the successful treatment of the material.

In some of these German buildings, indeed, very difficult pieces of construction, such as we are in the habit of thinking can only be executed in stone, are successfully attempted in brick. For example, they execute large tracery windows in this material. Great brick gables, often with the stepped outline known as crow's feet, are an excellent architectural feature of these German brick-built towns.

In parts of France, also, ornamental brickwork was, from time to time, made use of, but not extensively. It is not necessary to go very minutely into the manufacture of bricks; but, perhaps, I ought to say a word or two on the subject. Good brick-earth is not simple clay, but a compound substance; and what is essential is, that it should burn hard, or in other words, partly vitrify under the action of heat. The brick-earth is usually dug up in the autumn, left for the frosts of winter to break it up, and worked up in the early spring. The moulding is to a very large extent done by hand, sometimes in a wet mould, sometimes in a dry sanded mould, and the bricks are first air-dried, often under some slight shelter, as the rain or frost damages them when fresh made; and then when this process has made them solid enough to handle, they are burned and sorted into qualities. The ordinary or stock brick of London and the neighborhood presents a peculiarity, the origin of which is not known, and which is not met with, so far as I know, in other parts. Very fine coal or cinders is mixed with the brick-earth, and when the bricks are fired, these minute particles of fuel scattered through the material all of them burn, and serve to bake the heart of the brick. Stock bricks are burnt in a clamp made of the raw bricks themselves with layers

of fuel, and erected on earth slightly scooped out near the middle, so that as the bricks shrink they drop together and do not fall over sideways. Most other varieties of bricks are kiln burnt. A very large number of inventions for making bricks by machinery have been patented. If you have occasion to look through the specifications of these patents, you will find four or five main ideas appearing and reappearing, and only here and there an invention which is, to some extent, different from the others. A great majority of these inventions include machinery for preparing the clay or brick-earth, so that it may be dug up and filled into a receptacle, and worked up, screened from pebbles, and made fit for use in a short time, so as not to have to wait a whole winter.

This is done in some sort of pug-mill. A pug-mill is a machine consisting of a large cylinder with a central shaft passing through it from top to bottom. Knives or blades are arranged spirally in the shaft, and other blades project into the interior of the cylinder from the walls of it. The material, after being screened, is fed into this at the top, and properly moistened. The shaft is caused to rotate and the blades divide and subdivide the material, forcing it always downward so that it at last escapes at the bottom of the pug-mill in a continuous stream of moist well-worked-up clay issuing with some force. In one type of machine this clay stream is forced through a square orifice from which it comes out of the section of a brick, and by a knife or wire or some other means it is cut into lengths. In another type of machine there is a large revolving drum working on a horizontal axis, with open moulds all around its edge. The clay enters these moulds, and there is an arrangement of plungers by which it is first compressed within the mould, and then forced out on to an endless band or some other contrivance that receives it. A third type of machine has the moulds in the flat top of a revolving table, which, as it turns, carries each mould in succession, first to a part where it is filled from the pug-mill, next to where its contents are compressed, and lastly to where they are pushed out for removal. However made, the brick, when moulded, dried, and burnt and ready for market, belongs to some one sort, and is distinguished from other sorts by its size, color, quality, and peculiarities. The sorts of brick that are to be met with in the London market are very varied. To enumerate them all would make a tedious list; to describe them all would be equally tedious. I will endeavor, however, to give some idea of the most conspicuous of them. We will begin with that family of bricks of which the London stock brick is the type. It has been said these are clamp-burnt, and almost all the internal brickwork, and not a little of the external, of the metropolis is of stock brickwork. A good London stock brick is an excellent brick for general purposes, but cannot be called beautiful. Considering the vast quantity of brickwork done in the metropolis, it is a matter for congratulation that such sound materials as good stock bricks, stone lime, and Thames sand are so easily procurable and can be had at a price that puts them within the reach of all respectable builders. When a clamp has been burnt its contents are found to have been unequally fired, and are part of them underburnt, part well burnt, part over-burnt. They are sorted accordingly into shuffs, grizzles, stocks of two or three qualities, shippers and burrs. Several sorts of malm stocks, which are superior in color and texture, are made and are used for facing bricks and for cutting; and what are called paviors, which are dark and strong bricks, are also made. The London stock is erroneously, but usually, described as gray; it is really of a piecrust yellow of various tones. Sometimes it is the same color when cut, but the hardest stocks are of a dark dirty purple or brown, or sometimes nearly black inside. A stock brick is rarely quite square or quite true; its surface is often disfigured by black specks and small pits, and a stack of them often look uninviting; yet a skilful bricklayer, by throwing out the worst, by placing those of bad colors or much out of shape in the heart of the wall, and by bringing to the front the best end or side of these bricks which form part of the face, can always make the bricks in his work look far better than in the stack.

Another important group is the group of Suffolk and Norfolk bricks, red and white. These are very largely employed as facing bricks and for arches and cut mouldings. Moulded bricks are also to a large extent made of the same material. The bricks are brought to London in large quantities; they have a sanded face, are mostly square, true, and of uniform color, but they are usually porous, soft, and absorbent. Still, they are in great demand as facing bricks, and the moulded bricks enable the architect to produce many architectural effects at a moderate outlay. These fields furnish many sorts of bricks, which are called rubbers, and which are employed (as malm stocks also are) for arches of the more elaborate sort, where each brick is cut to its shape and rubbed true, and for mouldings, and even, sometimes, for carving. Mouldings that are formed by cutting the bricks can be got more perfectly true than when moulded bricks are used; but the expense is greater, and when it is done the material is less durable, for the softer sorts of brick are naturally used for cutting, and the moulded face is less sound than the original burnt face of any brick. Red bricks are to some extent made in fields within easy reach of London; but the best come from some distance. Red Suffolk bricks have been alluded to; there is a considerable importation of red Fareham bricks, brought all the way from the vicinity of Portsmouth. These are good both in quality and color. Good red bricks are also now made at Ascot, and are being used to a considerable extent in the metropolis. A strawberry-colored brick from Luton has been extensively used at Hampstead; it is hard, and of a color that contrasts well with stone, but not very pleasing used alone. Glazed bricks of all colors are obtainable; they are usually very hard and square, and the use of them, where an impervious glazed face is required, as, for example, in a good stable, is better than the employment of glazed tiles, in the employment of which there is always a possibility of part of the lining becoming loose or falling off. There is a difficulty in obtaining a large quantity (of some colors at least) exactly uniform in tint. Bricks with a very hard face, but not glazed, are obtainable. What is called a washing brick is now made in various colors, adapted for the lining of interiors, and there are hard bricks of a very pale straw color, known as Beart's patent bricks, made, I believe, of gault clay, which were some years ago bought up by the Great Northern Railway in large numbers. These bricks have the peculiarity of being pierced with holes about one half inch in diameter, passing quite through the brick, and they are extremely hard, partly because these holes permit the hot air and smoke in the kiln to approach very near to the interior of the brick. I am of opinion that the glazed or dull qualities of hard bricks might with great advantage be often introduced into London streets. What we want is something that will wash. The rough surface of stocks or Suffolk facing bricks catches the black in the London atmosphere, and gradually gets dark and dull. A perfectly hard face is washed clean by every shower.

A good many years ago I built a warehouse with stock bricks, and formed the arches, strings, etc., of bricks with a very hard face, and as I expected, the effect of time has been to make these features stand out far better than when they were fresh; in fact, the only question is whether they have not now become too conspicuous. To turn to the bricks in the London market, we have fire-bricks made of fire-clay, and almost vitrified, and capable of standing intense heat. These are used for lining furnaces, ovens, flues, etc. Then we have almost, if not quite, as refractory a material in Staffordshire blue bricks used in various forms for paving channels, jambs of archways, etc. There are also small bricks called clinkers, chiefly used for stable paving.

Dutch clinkers, formerly imported largely from Holland, were small, rough bricks laid on edge, and affording a good foothold for the horse. Adamantine clinkers, made of gault clay, are much used; they must have chamfered edges, otherwise they make too smooth a floor for a stable. Many other varieties are obtainable in London, and are more or less used, but these are the most prominent. In many parts of England special varieties of brick are to be found, and every here and there one falls upon a good brickmaker who is able to produce good moulded or embossed or ornamental bricks, such as those which have been supplied to me years ago by Mr. Gunton, and more recently by Mr. Brown, both of Norwich, or by Mr. Cooper of Maidenhead.

It is of importance to those whose business it is to look after or engage in building operations, that they should early learn what to look out for in each material. Of course a man only becomes a judge of bricks or timber or stone by experience; but he is far better able to take the benefit of experience when it comes to him if he knows from the first to what points to direct attention. Wherefore I make no apology for trying to put before you the points of a good brick, and in so doing I shall partly quote from a memorandum published now a good many years ago by the Manchester Society of Architects. A good brick is uniform in size; standard 9 by 4½ by 2½ in.; weight about 7 lbs. each, equals 110 lbs. per foot cubic; is rectangular, true faced, but only one end and one side need

be smooth, has no print sinking on either face, but a hollow on one or both beds. When saturated with water, a brick should not absorb more than twenty per cent of its own weight of water, should absorb it reluctantly, and part with it freely at ordinary temperatures. It should be uniformly burnt, should be sound, free from cracks, flaws, stones, lumps of any kind, but especially lumps of lime, should be of a good color for its sort (whether red, yellow, or white), should have a metallic clang when two bricks are struck together; when broken should be sound right through, should be tough and pasty in texture, not granular, and should require repeated blows to break it rather than one hard blow (such bricks will withstand cartage and handling best). So much for bricks.

(*To be continued.*)

BRICK GABLES.

The gable has been made one of the strongest features of brick architecture, and has been treated in a variety of ways. The broken outline in which curves are united with straight lines, and pediments are combined with curvilinear copings, is essentially a type of gable developed from brick, for we see that in all brick countries the ornamental gable has been the pronounced feature in the architecture. In Belgium and Holland the forms that are found are, as all architects know, of the most varied description, from the plain stepped or crow's-foot design, to the most "rococo" form of curvilinear outline. The curves are sometimes seen reversed like the Louis Quatorze or Quinze period, and terminate in twists, scrolls, or points of the most elaborate design. In England the Elizabethan or Queen Anne buildings show a less profuse and wanton arrangement; the gables are generally made up of simple curves placed with their convex sides outwardly in one place and inwardly in another, or of ogee curves terminated by a straight string with a pediment superimposed. Very little cutting is necessary in designs of this character; the bricks to the curved portions can be of moulded or plain rectangular shape. The coping bricks may be perfectly plain, set up on a thin moulded course, and projecting 2½ inches on the face, or be quite flush with the work below, only a double tile course projecting under it. In more ornamental designs the bricks are moulded on the under edge, specially made for the purpose, or the upper fillet is formed of two courses of tiles set in cement. The pedimental portions are composed of bricks with ovolo and square members and ogee for the top member of the pediment, and, of course, project on each face of the gable wall so covered. The upper course ought to be made of large, purposely moulded bricks, with close joints and set in cement.

Considerable care is required in forming these coping courses. The joints should properly break bond; the bricks themselves should be hard and well burned, and be well grouted in cement mortar. Owing to the porosity of the bricks or joints, lead is sometimes used as a covering to the top course; but this expedient ought to be avoided if possible. The plain flush coping, cut to the contour of the gable, and having two or three projecting courses of tiles laid beneath in cement mortar, is one of the most effectual modes of keeping the rain from penetrating the gable wall, as the projecting tile course, or "tile creasing" as it is called technically, throws off the water like a drip moulding from the faces of wall. For a moulded brick coping two courses may be used; the lower course may have a cavetto, or cyma reversa, worked on the edge, either placed flatwise or, if greater boldness is desired, on edge, and above this a plain course of bricks on edge, or three courses of tile can be laid as a fillet. The aim of the designer of brick mouldings for this purpose should be to produce one or more sharp lines of shadow, not too large or deep, or it will look heavy to the eye. The mouldings ought to be simple and effective with bold squares, instead of divided into several members which would never be seen below. We have seen gables finished with moulded cement copings than which nothing looks worse or more patchy. If brick is used for the gable wall, let it appear as the finish: do not shirk the trouble of a coping, or the art of the brick setter will be compromised just where it should be evident. For pediments the moulded bricks may consist of the cymatium, in the oblique sides, with fillet underneath, the horizontal members will be a fillet and corona, and beneath this a fillet and echinus, or quarter round. With these few members the effect will be bold. The corona, with its fillet joined with a small cavetto, throws a deep shadow, which is relieved by the lowest member, or quarter round.

To obviate the exposed coping the roof is often carried over the gable, the latter being finished by a series of mouldings in purpose made bricks. The upper member may be a cyma recta with fillet, the second row a plain square profile, and the underneath a cavetto or cyma reversa. Of course this kind of finishing does not admit of ornamental outlines; the sides are straight so as to allow the roofing to be continued over the gables. We wish to call attention to the necessity of obtaining moulded angle or apex, and return bricks for the gables so as to insure sharp mitres at these points. It was mainly the difficulty of getting moulded bricks made for gables that induced our forefathers to employ stone and cement for copings, both of which materials required often to be painted to prevent the absorption of moisture.

We do not say anything against a stone coping when a durable material can be obtained that will weather well. Many of our modern Tudor buildings of brick and stone may be mentioned in which the two materials are combined. But if good moulded brick or terra-cotta can be had, why should stone be employed, as it adds to the cost and is less durable than good brick. The effect has had something to do with the matter. A brick edifice with stone dressings is more showy, and the relief of the two colors is preferred by many people. The architect must be the judge in every case. If a good weather stone can be had at a moderate cost, the relief is of some value; but our experience of many modern buildings in which a soft freestone has been used for dressings has proved to us the value of moulded brick and terra-cotta when it can be obtained of good quality. — *Building News.*

REVIVAL OF BRICKWORK IN ENGLAND.

One of the recent, and as far as it relates to architecture, one of the most important revivals of this generation is that of the art of brick cutting. Brickwork began to revive some forty years ago, when the reign of stucco and cement had come to an end, and when the mania for disguise had ceased to enthrall architects and their patrons. The change was brought about partly by a sort of moral reaction against shams of all kinds, and partly by a desire to reintroduce the vernacular brick style of building of the Tudors, especially that of Henry VIII. and Elizabeth. A new impetus was given to brick manufacture, and architects began to reproduce, with more or less tameness, the ornamental gables and chimneys of Tudor houses; but it was soon discovered that the practical bricklayer was not equal to the task put upon him; he was unacquainted with the art of cutting and setting bricks for ornamental gables, chimneys, and oriels. A new school of bricklayers was necessary before a brick style of architecture could be introduced worthy of the traditions of Tudor times, and of the subsequent Dutch or Queen Anne period. A quarter of a century has accomplished a good deal. Thanks to the Venetian Gothic craze, and the Queen Anne revival, we have now a few artist workmen in the craft equal to any of their predecessors. We owe to the latter style a resuscitation of the long dormant art of brick-cutting, moulding, and carving. To Mr. Ruskin, the late Mr. Street, Mr. Norman Shaw, and Mr. Alfred Waterhouse, worthy pioneers in the movement, we owe brick buildings that will compare with those of the previous century. If our brick architecture has not yet achieved a definite place in our recent history, it is because the trade of brickmakers and the crafts engaged in the work have failed to reach the standard which they attained in other countries and times. The practice of cementing brickwork has seriously hindered the progress of the art; the brickmaker benefited by thus being able to manufacture inferior bricks, and the workman engaged in laying was enabled to hide an unskilful hand. When we look back to the brick buildings of the days of the Tudors, or even to the later time of Jones and Wren, we observe that the art derived much of its precision and beauty from the brickmaker; the bricks were well and truly made, moulded into good forms, and of pleasing color. — *The Building News.*

Many architects in specifying the quality of brickwork insist on the uniform color of the bricks, in almost complete forgetfulness of the fact that the old and best examples show a mixture or blending of the tints produced by the various constituents of the clay and the great heat of wood burning. In the remains of brick buildings at Hampton Court, Porchester Castle, Layer Marney, and other places, we notice a soft mingling of color, due to weather stains and age, which constitutes the charm of old brick architecture. — *English Ex.*

THE BRICKBUILDER COMPETITIONS.

COMPETITION NO. 5.

A BRICK FIREPLACE.

Programme. It is desired to design an ornamental brick fireplace to form the principal feature of the hall in a residence of moderate cost. The hall will have a tile floor, and be finished in quartered oak, with panelled dado four feet high. The ceiling will be nine feet high. It is the intention to carry the brickwork to the ceiling, thus securing an overmantel of brick. The fireplace opening is not to exceed four feet wide and two feet six inches high, while the whole width of the fireplace is not to exceed ten feet. It is supposed to be placed in the middle of a wall space of twelve feet. In addition to indicating the catalogue numbers of the ornamental bricks used, the cost of all the face and ornamental bricks necessary to build the fireplace must be given. This can be secured by sending an exact schedule of the bricks required to the manufacturers, and it is stipulated that no bricks shall be used not advertised in THE BRICKBUILDER prior to the August number. The bricks of one maker must be used throughout the design.

There will be prizes awarded as follows: First, $15.00; second, $10.00; third, $5.00; fourth, $3.00. Five fifth prizes of subscriptions to THE BRICKBUILDER for 1892. Drawings must be made to a scale of an inch to the foot, and must include plan, section, and front and side elevations, drawn upon a sheet 14 x 20 inches, without border, or any lettering save device by which the design is distinguished, cost of stock, and the indications of dimensions and bricks used. All designs to be sent to the office of THE BRICKBUILDER, prepaid, by Oct. 1, 1892. Stock mantel designs of manufacturers are barred from competition.

The attention of all architects, designers, and draughtsmen is directed to the competitions announced in the April number, of three cornices and three chimneys, and it is hoped that many will enter both of these competitions. Should the number of good designs largely exceed the number of prizes, it is very probable the publishers of THE BRICKBUILDER will purchase the use of the best of the designs failing to receive prizes, so that every good designer is practically certain of receiving something for his work. It is not improbable that many of these designs will be wanted by the companies whose bricks are used, and designers are therefore urged to confine their selection to the companies advertised in THE BRICKBUILDER, all of which are progressive, and as fully appreciative of the necessity of good design in brickwork, as they are to the necessity of mechanical perfection in the bricks they manufacture. A copy of the April number will be sent free to every intending competitor.

HARTFORD, CONN., July 6, 1892.

Editors Brickbuilder:

DEAR SIRS, — We are pleased with your paper, and urged our boys to enter the competitions. They are now glad they did.

We highly approve your action and hope you will continue the series. We would suggest more trials in composition of fronts, or angles, or gateways — or a combination of windows, including a rose, for the wall of a church. And would it not be well to specify some historic style for some of these? Various types of Romanesque, Renaissance, or Gothic could be readily worked out with the patterns obtainable.

We regret that your jury did not criticise the competitive attempts published in your last issue, for boys that will design such things do not, of course, know why they are wrong, and a little judicious criticism would doubtless be of help to them.

Yours very sincerely,

COOK, HAPGOOD & CO.

THE ILLUSTRATIONS.

Plates 33 to 38. The BRICKBUILDER'S Design for a Church by J. A. Van Straaten, Jr., Boston.

In order to promote the more general use of brick the accompanying plates are given as an example of good architectural treatment in brick. The problem of a church was selected as one of wide application and one in which the architectural capabilities of brick could readily be illustrated. No attempt was made to produce a design which should be adopted in any given case, but rather a typical design which would give opportunity to show what can be accomplished by a simple and appropriate use of brick both inside and outside of the building. The drawings really speak for themselves; they show an arrangement of walls, columns, pilasters, arches, vaults, windows etc., connected so as to show the application of brick to a building of some elaboration. The style chosen is Gothic of the 15th century. The design is entirely of brick, no stone trimmings being anywhere employed. Sills and water tables are of brick, which should be laid in cement. The mouldings used are extremely simple and few in number; with the exception of the cornices and water tables of buttresses where drip mouldings were required, only a single form of moulding has been used throughout. The tracery is made very simple in design, so that it could be built up with simple moulded brick arches, using special brick only at the springing of the tracery and at the intersections of the tracery bars. The interior is vaulted entirely in brick. The best effect would be obtained by building the walls of common red brick, laid with wide joints in white mortar.

The lower portion up to the plinth should be of hard burned bricks laid in cement. All window mullions and the parts of the supports of the arches which require strength, and the gable and buttress copings should also be laid in cement. The walls might be bonded in Gothic or cross bond, which varies from English bond in laying the stretchers so that they are over each other only in alternate stretcher courses, instead of having the stretchers all over each other as in English bond. The vaults might have the vaulting compartments of a small yellow brick, while the vaulting ribs should be red moulded brick so as to carry up the wall color into the ceiling. In the detail of the transept wall an arrangement of recesses is shown, which adds to the appearance of the wall and carries the line of the nave arcade. Such a system of blank arcading is often useful in giving interest and architectnral treatment to a wall where the design requires it.

Plate 39. Building for the Girls' Mutual Benefit Club, Chicago. Jenney, Mundie & Waid, Architects.

This design is built entirely of plain, unmoulded brick, with the single exception of the crown moulding of the cornice, which has a simple moulding of Anderson manufacture. The only feature we are inclined to criticise is the arcaded corbel-table in the cornice, which, it seems to us, might have been improved by using somewhat smaller arches, which would have been more in scale with the rest of the work. But in spite of this defect the cornice is unusually interesting and effective. We referred to this building on the occasion of the publication of a perspective sketch of it in the March number of the *Inland Architect*.

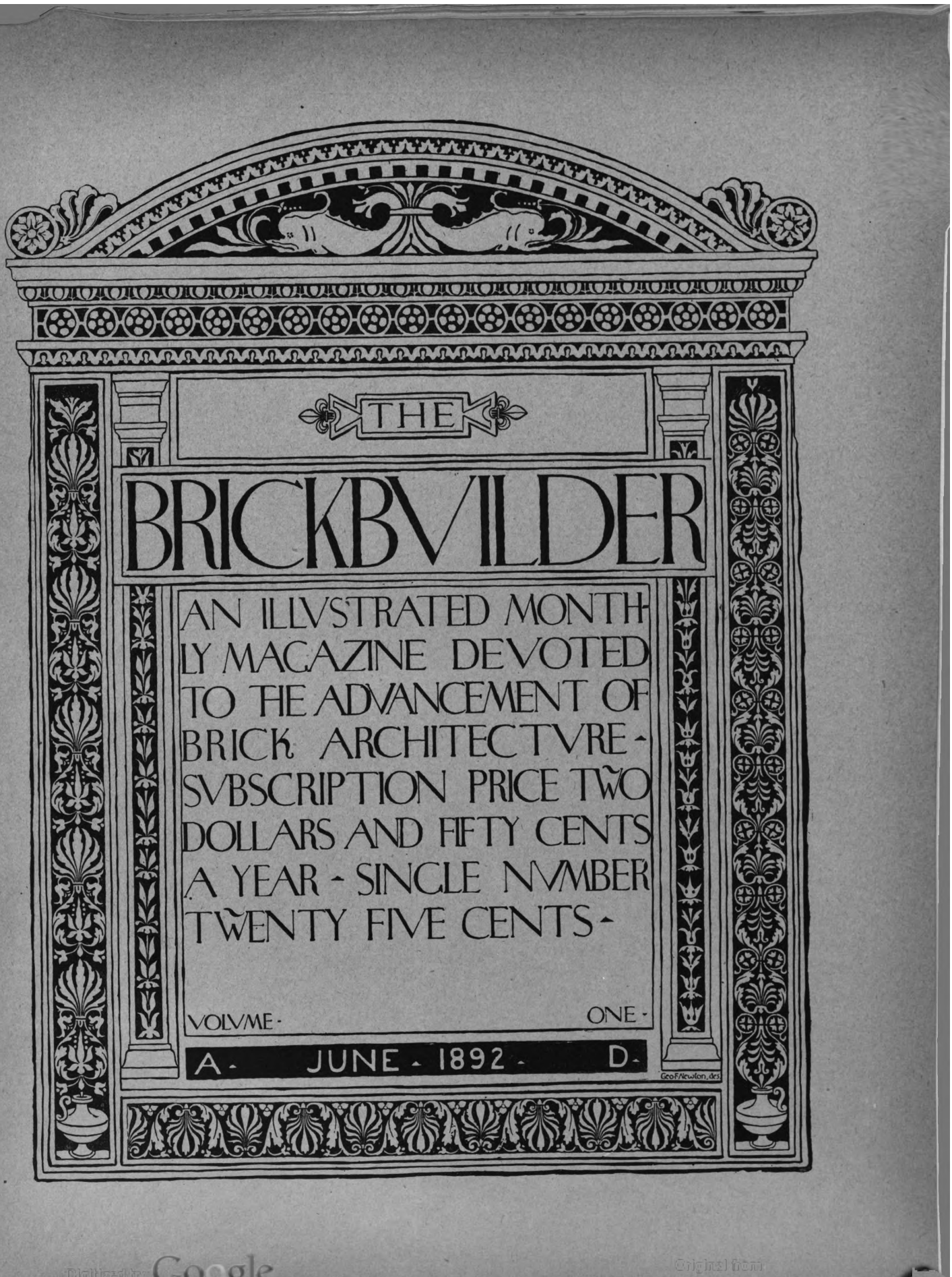
Plate 40. Detail of Building Corner Congress and Purchase Streets, Boston. Cabot, Everett & Mead, Architects.

This plate gives the detail of the upper portion of a simple brick warehouse and store building, and gives a variety of detail, all obtained with plain unmoulded brick. The building is built of Eastern face brick laid in red mortar.

BOOK REVIEW.

Details for Stone and Brick Architecture in Romanesque-Gothic Style: Bases, Profiles, Cornices, Architraves, Windows, Dormers, Oriels, Balconies, Towers, Chimneys, Doors, Gates, Stairs, Vaults, and other details in Stone and Brick, by G. G. Ungewitter. Berlin: Claessen & Co.

The third edition of this German publication, of whose title the above is a translation, has been sent us for notice. It is a portfolio containing lithographic plates of various details, as indicated by the title, drawn in line. The designs are German-Gothic in style, and many of them round arched, whence we presume the curious appellation "Romanesque-Gothic." Many of the plates show interesting and ingenious treatments of brick detail; some of the diaper patterns in brickwork are especially suggestive. In general, the detail of the brickwork is more interesting than the larger designs of which they form a part, and which have the defects which are common in the recent revival in Germany of late German-Gothic forms. Still, as we have said, the work contains much that is suggestive.



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In our last number, when speaking (apropos of the new Boston building law) of the increased recognition of the importance of brick and terra-cotta as fireproof and fire resisting material as exemplified in the provisions of that act, and the likelihood that the use of clay, fire made materials would constantly increase, we remarked that these facts and the new conditions of modern construction pointed to the desirability and the opportunity for a new development of brick and terra-cotta design in building, which should not only fulfil these practical conditions, but take advantage of them as suggestions for a new and consistent artistic treatment of clay materials. The advance that has already been made we can see by comparing the buildings of which the Madison Square Garden in New York is at once the type and the most successful example with such buildings as the Cotton Exchange in the same city. Successful as the last named building is, — at the time it was built it stood more solitarily as an artistic success than does Mr. Stanford White's *chef-d'œuvre*, — it is yet a less successful treatment of brick and terra-cotta *as such*, and recognizes less the character of the material in the design than does the more recent building, and we say this in full recognition of the utterly differing character and purpose of the two designs, which would render comparison of them in other respects inappropriate and profitless. But we look forward to still further development by means of a more complete and consistent use of brick and terra-cotta construction, and a frank expression of this construction in the design. Such development can only come about by solving each problem as it occurs with the single purpose of giving the most appropriate and most consistent expression to the conditions. To accomplish this advance brick architecture certainly needs closer study than it has yet received among us.

It is not only on the æsthetic side that brick as a building material needs further study. We need a better understanding than we now have of the purely practical and structural requirements necessary to produce the best possible brick, and the best possible brick building, under varying conditions. So long as brick was regarded as an inferior material, rule-of-thumb and hap-hazard methods were, if not well enough, at any rate all that was to be expected. But now that the clay materials are coming to be regarded more and more as the best building materials we have, it will rapidly become a matter of necessity to have a science of bricks and brickwork, which shall deal exhaustively with clays, both before and after they are made into bricks. It is true, that clays have been analyzed, and bricks have been tested by methods more or less scientific. But the knowledge accumulated on this subject has hitherto been too unsystematic, and too uncertain to be of much practical value. Brickmakers will tell you, that analyses of clay are deceptive and misleading, and that after all there is nothing to do but to "experiment." And so every new brick concern and every old one that tries to improve its methods sinks a large amount of capital in experiments, the results of which are rarely scientifically examined, or tabulated, and which are kept more or less closely as trade secrets, while the less progressive concerns stick to rule-of-thumb methods and make but little progress.

What is needed is a careful, methodical, and scientific examination of the various clays, with a view to determining exactly what kinds of bricks can best be produced from each particular clay, and what are the methods of manufacture best adapted to produce the results desired in each particular case. Such an examination as we speak of, would involve, then, a thorough examination of the various brick machines and kilns in relation to the different clays, as well as an examination of the clays themselves. Further than this a true science of brickwork would give the precise qualities as to strength, fireproofness, resistance to atmosphere and frost which was to be expected from the various brick produced or producible, and the best methods of taking advantage of these qualities in building. Of course such knowledge as we here point out as desirable is not to be obtained all at once. Innumerable experiments by numbers of practical scientists and much time will doubtless be necessary before the present scattered and confused knowledge of the subject could be systematized and consolidated into anything that could truly be called a science. But a single, able man with the necessary scientific and practical knowledge could lay the foundation of such a science, and would undoubtedly find substantial reward in so doing, as, indeed, some of those who have brought scientific knowledge and research to bear upon the subject already have.

We do not for a moment suppose that, with regard especially to brickmaking, the scientist would supplant "the practical man." We well know that in no art is the knowledge that can only be acquired by practical experience, and which cannot be expressed in terms, more essential than in the art of brickmaking; but every intelligent brickmaker will admit, that such scientific knowledge as we have alluded to, would be an immense aid and immense saving of time, money, and annoyance in his work, and would certainly lead to improved results. Brickmaking should attract men of scientific training to its ranks; and as we have already said, such researches as we desire to see made should be undertaken by men who not only have that training, but are thoroughly conversant with the practical requirements of brickmaking.

That a more thorough and systematic knowledge of the qualities of various kinds of brick would be of the greatest advantage to the architect and the builder, will be still less likely to be disputed.

In the course of a review of Mr. Schuyler's volume of essays, entitled "American Architecture," apropos of his chapter "concerning Queen Anne," *The Architectural Review*, while admitting that the term has in this country come to be applied to "all nondescripts," undertakes to consider its cause and effects.

The remarks of the *Review*, as those of Mr. Schuyler, relate wholly to what in this country has been miscalled by the name of the worthy queen, who, though she was never credited with any great amount of taste, must turn in her grave at the way in which her name has been taken in vain. We must confess to no little surprise at finding two such authorities as Mr. Schuyler and the *Review* willing to treat with seriousness this abuse of the term, which has not even been consistently applied, so that it would be impossible to state definitely what is meant by those who use it. We scarcely remember to have heard any use of the term as applied to architecture in this country that was not deserving of ridicule, just as the poor queen's very name is constantly mispronounced "Annie". We have heard it used to describe buildings of utterly different character, of utterly different style, but we never remember, of late years, at any rate, to have heard it applied to such few buildings in this country as might with some show of propriety be referred to as in the style of Queen Anne.

We must also take exception to the statement of the *Review*, "that there ever was an actual Queen Anne style in England is not a matter of speculation but of denial." This certainly requires some qualification. Though perhaps not properly called "a style," the term "Queen Anne" has been in England very definitely applied to a group of buildings of distinct character, many of which, at any rate, were executed in the reign of the much abused queen.

But in order to do what little we may to aid in laying this Queen Anne ghost, let us state the facts, — if indeed the ghost has not already materialized so far as to be beyond exorcism, — and truly the case is much like that of the shadow who finally succeeded in usurping the place of the man. We fully expect this mongrel American humbug will rise up and say, "I am the true Queen Anne; the English Queen Anne never existed and, anyway, she's been dead since long ago."

The facts with regard to the use of the term are as follows: In England it has been used to designate the brick architecture of the later English Renaissance. Subsequent to the fire of London in 1666 the city was, by royal ordinance, rebuilt of brick instead of in half timber as it had been, and this fact, together with Dutch influence, which came in especially under William of Orange, gave great impulse to the use of brick everywhere in England. Classical forms were used as a matter of course, and often considerable ingenuity was shown in adapting them to brick construction; moulded brick, generally rubbed, was largely used and carved brick ornament, but great ingenuity was also shown in the use of projecting courses of plain bricks in the place of mouldings. The Gothic fancifulness which persisted longer in England than almost anywhere else largely influenced and modified the use of classical forms, especially in the country, where this influence was strongest, where the stricter classicism of Wren did not penetrate, and where the style, if we may so call it, received its most characteristic development, especially in domestic work. Tall brick chimney tops of rich and varied design, and scrolls and scroll work executed in brick, are characteristic features of the style, which might be briefly characterized as Renaissance architecture in brick, modified by the remnants of English Gothic feeling and by some Dutch influence. It was, to some extent, contemporary with our early colonial work, but was characterized by heavier detail throughout, as well as by being distinctively a brick style.

The term we are discussing applies, then, as originally used, to brick architecture especially, and its application to our wooden buildings is therefore the more absurd. Subsequent to the Gothic revival in England, when that movement had spent its force, a number of clever architects in England, of whom Mr. Norman Shaw was perhaps the most prominent, abandoned their previous Gothic work, and headed what was known as the Queen Anne revival, and a large number of interesting brick buildings were produced under this influence. Every English movement in architecture finds more or less reflex in this country. Here, also, buildings were produced calling themselves Queen Anne, and some might fairly be so-called. Such are, in Boston, the Children's Hospital on Huntington Avenue, by Bradlee, Winslow & Wetherell, Dr. Shattuck's house on Marlboro Street, by Cabot & Chandler, and a few other houses in the Back Bay district. But our suburban domestic architecture is, for the most part, of wood, and when the attempt was made to translate this brick style into wood, monstrosities constantly worse and worse were the result, and were miscalled Queen Anne. A little later than this a more consistent wooden style began to be developed, mainly under the influence of Mr. Richardson and Mr. McKim, in which shingles were used as a wall covering, and the general form of the house was made attractive and picturesque, while the detail was exceedingly simple. This naturally had some influence on the builders of the monstrosities called "Queen Anne," but the public to whom the term meant anything different from the French roofed and jigsaw-disfigured house to which it had been accustomed, called all these new methods of building indifferently, "Queen Anne." This, we believe, is the history of the use and misuse of the term, which, we repeat, applies properly only to a particular style of brick architecture. At some future time we may take occasion to speak further of this development of brick architecture in England, and hope to give some illustration of the best examples of the style, old and new; for, though by no means in all respects exemplary work, there is yet much in it that is suggestive.

We print in another column a letter from a correspondent suggesting that we made a mistake in stating in our description of THE BRICKBUILDER design for a church that the brick should be laid in white mortar. It is true that the conventional taste of the day prefers red or brown mortars, but for a reason precisely opposite to that which our correspondent supposes. Not in order to distinctly mark the individual bricks, but in order to produce a uniform and monotonous wall surface, are the dark mortars preferred. We have already in these columns given the reasons why a wall surface of monotonous color is objectionable. In lacking variety it lacks interest. In such large wall surfaces as our church design presents, the monotonous effect produced by using red mortar with red brick would be especially objectionable, and the deep red color so produced would be less pleasant than the gray red that would result from using white mortar. True, the white mortar would somewhat tone down with age, but it would not become red, but would still present a contrast to the bricks which, with time, are themselves somewhat modified in color.

Our brick-built streets would present a much pleasanter and softer color to the eye if white mortar were used instead of the usual colored mortars. If the natural color of the mortar is to be modified at all, it would be better, in most instances, to use a white putty for pointing and this has often been done with excellent effect.

The introduction into Germany of facing bricks so constructed as to be readily divided into halves and quarters appears to be a revival of mediæval methods. Herr W. Narden of Cassel, Germany, writing to the *Deutsche Bauzeitung*, calls attention to this fact and urges the more general adoption of such bricks from a standpoint of economy. Herr Narden has had long experience in the restoration of old brick edifices, and claims that this kind of brick was fully perfected in the Middle Ages.

Competition No. 7 will be announced in the next number. It will consist of a brick cottage for a moderate sized lot, just the problem that occurs in nine out of ten cases. The awards will bring out good talent.

FIG 1.

A PLEA FOR THE MORE GENERAL USE OF BRICK IN OUR SUBURBAN HOUSES.

The first general impression left in the mind of the writer on contemplating for the first time the ordinary wooden house of this country was anything but satisfying. Had this impression been the result of mere sentiment, an association of ideas, or a bias in favor of old English domestic architecture, a residence of sixteen years in this country would long ago have obliterated all this; but the feeling of unsatisfactoriness remains, and must be resultant from some rational causes. Let us analyze the subject. First, the wooden house, as we construct it, suggests no idea of permanency. Structurally considered, it is more nearly allied to a tent, and lacks solidity, which is an important element in all good architecture. For the same reason an iron frame building, covered with corrugated iron, is never satisfactory. The wooden house appears like a shell; it is "thin" and "edgy"; its angles and lines are painfully straight and regular, no matter how long it may be exposed to the weather, and it never seems to get united with the ground on which it stands in the way that a brick or stone structure does.

The base of a stone or brick building may step up or down to suit the inequality of the ground; but the base of a wooden building is no longer structurally a "base"; it becomes a "water table," and forms generally a level line marking the bottom of what suggests a huge wooden box.

At the present time we are the only people who build in this way, and the chief reason we do so is presumably because it is "*cheap*." But there must be something wrong about this, for even wealthy and well-to-do citizens build wooden houses. If we look a little deeper

FIG 2.

another reason may come to the front, and a popular one, to wit, — "We can get more show for the money."

A gentleman recently had built for him a brick house colonial in style. His architect advised him to finish the brick wall with a simple brick or stone cornice, and he would then have an enduring building which his successors would be proud of. He replied that he was building for himself, and did not care a rap for his descendants, so the cornice was made of wood, and enriched with many yards of egg and tongue ornament, and modillions. He has "more show for the money."

All this I am afraid is characteristically American. The architecture of a nation reflects its character, and the wooden house is simply typical of our times.

But there are other reasons why wooden houses are objectionable. Compared with brick or stone the wooden house is highly combustible, and in danger from fire. It is also more difficult to heat in winter or keep cool in summer, and in order to preserve the exterior, it needs painting more or less frequently. Further, we are using up rapidly our supplies of timber, which should be kept for interior work, or such purposes as only wood can serve.

About seven years ago the writer advocated in the *American Architect* the use of plaster on the exterior of houses, and in that article contrasted the way in which wood was used in England during the sixteenth and seventeenth centuries, with the later colonial work in this country. In the former the wood, mostly oak, was worked out of the solid, retaining unmistakably its wooden character, whilst in the latter the wood was moulded in thinner pieces, built up, and imitated stone construction. Of course we admire the colonial work for its classical proportions and its refined detail; but, after all, when we come down to first principles, the earlier work, with its breadth, honesty, and solidity, is the nobler architecture.

FIG 3.

It may perhaps seem hopeless to preach the gospel of high art to a people who, for the most part, are, concerning architecture, blind or indifferent. Nevertheless we know that in all progressive countries — and this country is one of them — a certain number are in advance of the rest. While these exist, there is hope for social reform, there is hope for art. To such I would say, Can any observant and thoughtful person travel through the southern rural parts of England without admiring the picturesque beauty of the old villages? The warm red brick of the cottage walls, the tile roofs, the creamy colored plaster work, and rich amber color of the wood work, the open casements, all go to form a pleasing picture. Could any one, with the least artistic sense, look upon such dwellings without being conscious of the homelike feeling and the poetry of life which they express? And then, we might ask ourselves, Is our own life so different, so much less restful, that such architecture is wholly unsuitable for us? Surely not, unless the sense for art and poetry has wholly left us. Perhaps we must look to the sympathy and encouragement of the artists and poets in our endeavor to build more beautiful dwellings. But to come down to mundane things, let us consider what materials we have, and how they can be artistically used. First, then, we have good bricks, terra-cotta, and tiles of all kinds, and they are just as needful, just as suitable in this climate, as in England or other parts of the world. We have also in these days much variety of color in our materials — another

valuable medium for the artist to work with. Photography has brought us examples of artistic brickwork from all parts of the world, so that if we fail in achieving great results, the fault lies with our designers. Ruskin says somewhere, "A nation must build well in brick before it can build well in marble"; and truly the humbler material needs even more care and consideration.

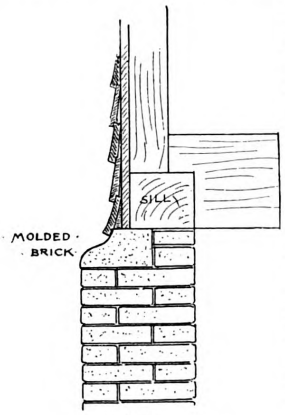


FIG 4.

A design which looks well on paper may look disappointing in execution, perhaps because such apparently simple things as the texture of the bricks, or the size of the joints and the color of the mortar, have not been considered, or perhaps the materials which come next to the brick do not harmonize with it.

When we have two materials, such as stone and brick, to work together, nothing looks worse than to see the stone used in the main wall, and brick as quoins at the angles. There is a house across the street from me where the architect faced an outside chimney with granite and used brick for the quoins!

There seems to be a prejudice against using brick underpinning to wooden buildings, perhaps owing to the porosity of most cheap bricks. But this can be overcome by using damp proof courses, and an advantage is gained in the readiness with which door and window jambs can be built, and the increased space which a thinner wall gives in the cellar.

Reference has been made to the absence of a base in wooden buildings; but where brick is used for the underpinning, and the sill set far enough back, a good effect can be had by finishing the brickwork with a moulded brick set in cement under the water-table, thus (see sketch, Fig. 4): —

In England, at the present time, there are many country cottage houses being built with brick walls, coated on the outside with cement. As the common stock brick is used for this purpose, a cottage can be built cheaply and yet be artistic looking.

A London architect has designed a number of these houses, chiefly for artists who appreciate their simplicity and picturesque appearance. They give the opportunity to use color in a way that renders them still more beautiful. The wall filling of rough plaster is generally white or cream color; the timber in gables and elsewhere either dark brown or black, being sometimes coated with tar for preservation. The red or brown tile roof, with a liberal projection to the eaves, crowns the whole.

Where cheapness is a prime necessity, such a mode of brick building might be advantageously used in this country in our suburban districts.

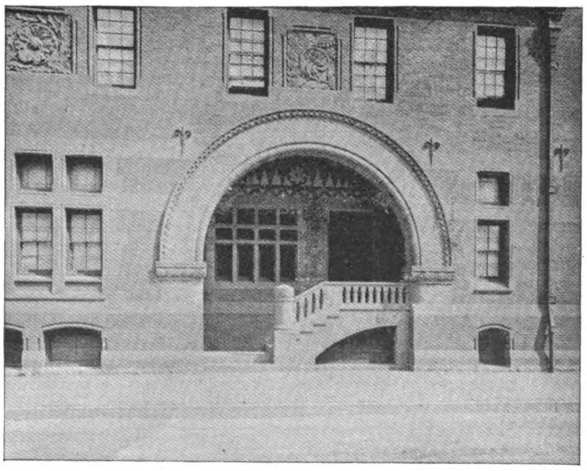


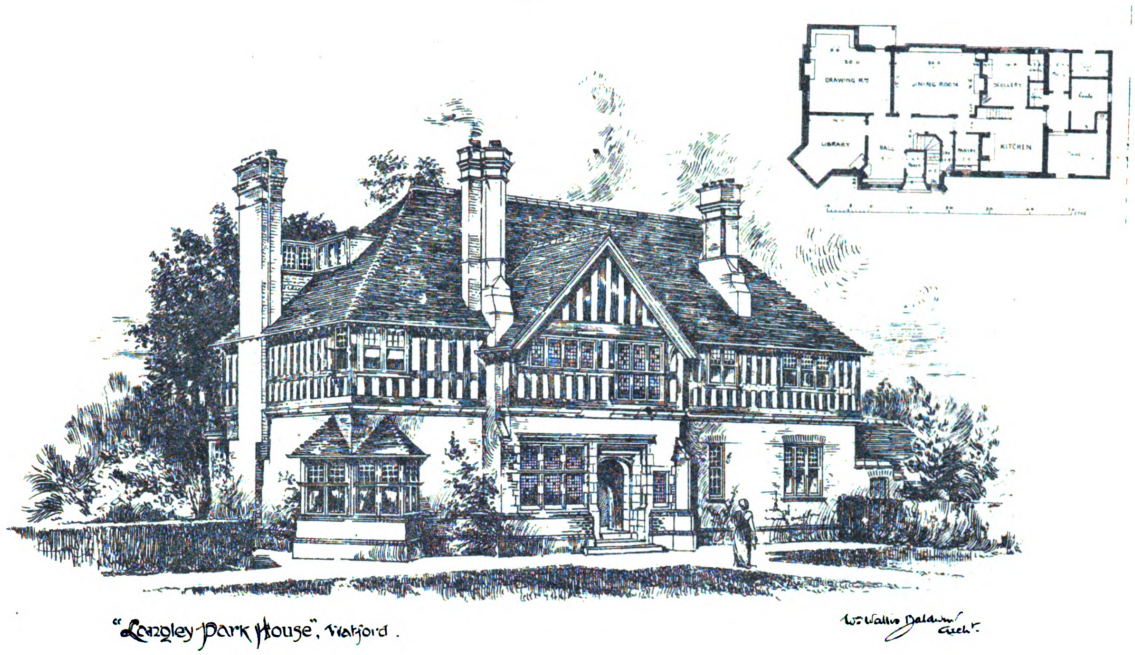
FIG. 5.

FIG 6.

The hard, uneven clinker bricks would make a good wall to keep out water, and with a thick coat of "rough cast" on the outside, it would be cheap and serviceable. The quoins and jambs could be built with a better class brick set flush with the outer face of cement.

As a sort of compromise between brick and wood building, in houses of two stories, the lower story might be built of brick and the upper framed with wood, and either plastered or shingled outside. By projecting some parts of the frame over the brickwork below, or by building courses of moulded corbelling bricks at the junction of the brick wall and the work above, a good effect can be obtained. The house built for Mr. Neil McNeil, the builder in Dorchester, from designs by Mr. E. J. Lewis, Jr., is a good example of this style of building; also the modern English cottage near Colchester, by Mr. W. H. Atkin Berry, of which two views are given (Figs. 2 and 3), taken from *The Building News*, showing the use of tiles on the roofs and chimney gables, as well as of brick in the first story with wood and plaster above. Plate 41 also shows two examples of similar treatment, the upper one taken from the *British Architect*, the lower from the *The Building News*. In the larger house, Wightwick Manor, the lower story and tower are of Ruabon bricks and terra-cotta, with stone quoins and plinth, while the roof is covered with tiles. All the timber framing is English oak, cut from the solid.

Terra-cotta works well with brickwork, and as we have now left behind us, as a thing of the past, much of the lobster red coloring in vogue some years ago, we may hope for more harmonious combinations of the two materials. In the jambs of windows, sills, lintels, mullions, etc., terra-cotta should be used more than it is. The house on Clarendon Street, designed as the rectory for Trinity Church, by the late H. H. Richardson (Figs. 5 and 6), is a fairly good example of brick treatment. It has a solid, substantial appearance, and decidedly "bricky" effect, enhanced, no doubt, by the red slate and tile roof. The way in which the windows are divided is admirable. The panels between the windows are of carved brick. Another architect, following on the same lines as this house, might now use in conjunction with the red brick, a brownish terra-cotta. One of the best examples in Boston of varied color brick treatment is the front of a small building on Park Square, for the Bay State

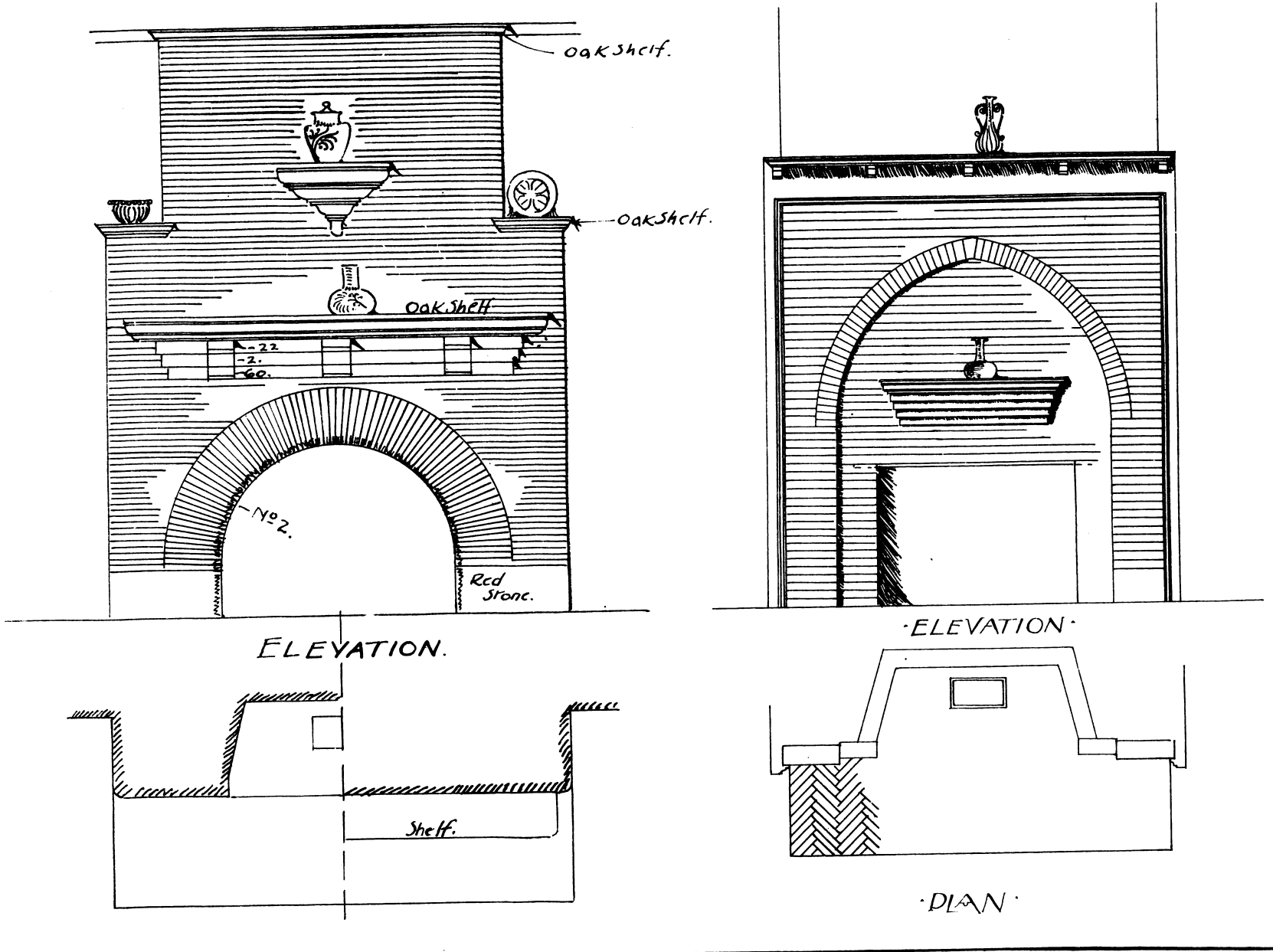


"Langley Park House", Watford.

Wm Walter Baldwin Archt.

WIGHTWICK MANOR.
STAFFORDSHIRE.
GRAYSON & OULD. ARCHTS

Forbes Co



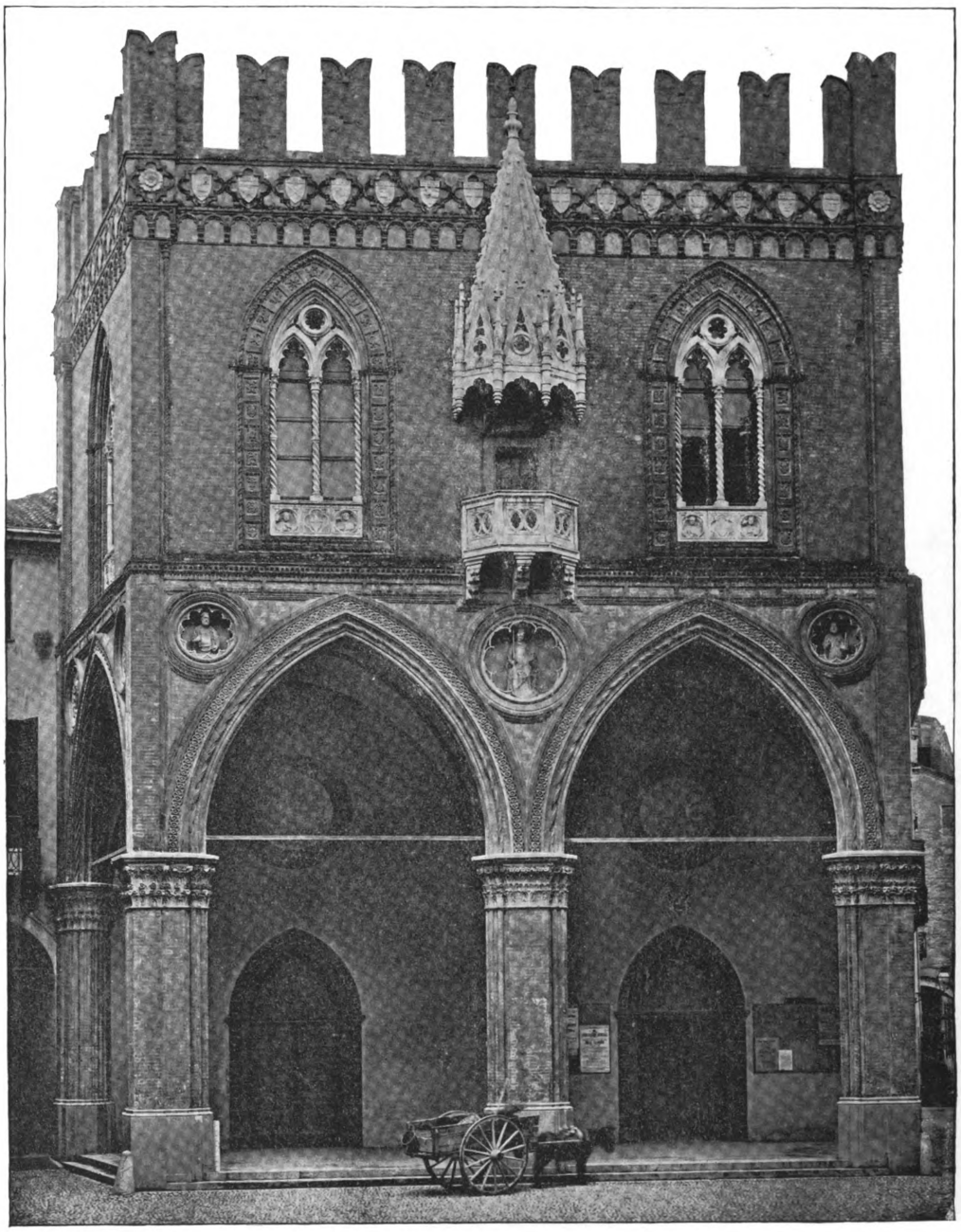
BRICK HALL MANTELS.

MANTEL IN HALL, RESIDENCE OF L. C. HANNA.
C. F. SCHWEINFURTH, ARCHITECT, CLEVELAND, OHIO.

MANTEL IN HALL, RESIDENCE OF N. W. CUTTER, CLEVELAND, OHIO.
C. F. SCHWEINFURTH, ARCHITECT, CLEVELAND, OHIO.

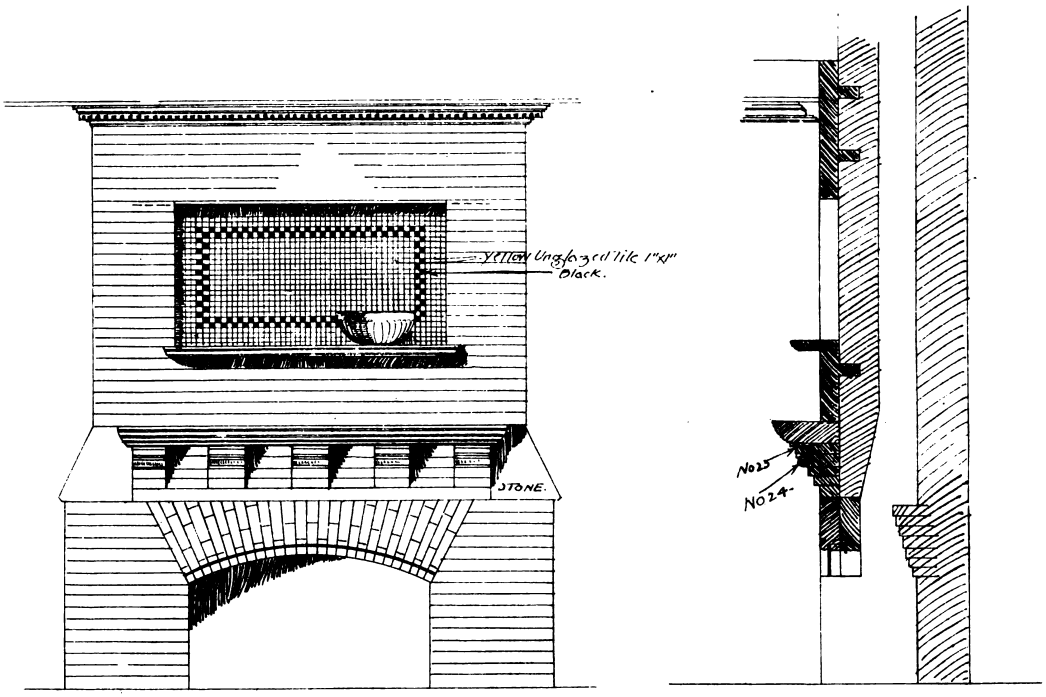
SUPPLEMENT TO THE BRICKBUILDER.

JUNE, 1892.

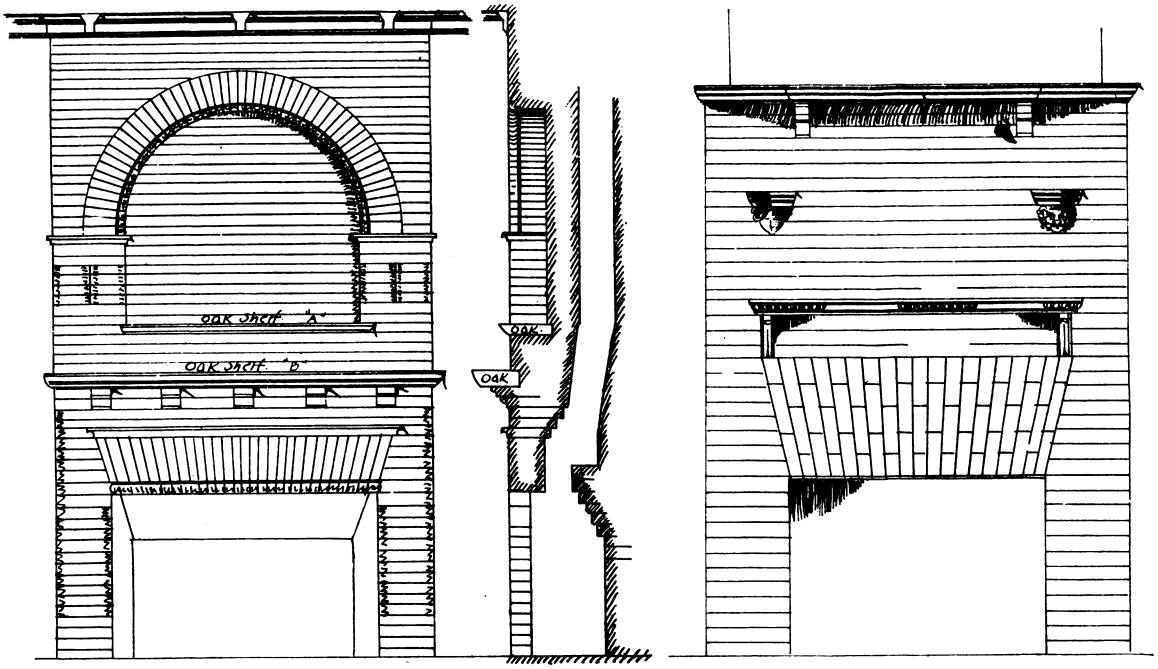


FORO DEI MERCANTI, BOLOGNA.

Fourth of a Series of Photographs of Foreign Brickwork.



MANTEL IN "THE CLEVELAND DRIVING CLUB" HOUSE.



MANTEL IN BILLIARD ROOM, RESIDENCE OF M. A. HANNA. MANTEL IN LIBRARY, RESIDENCE OF S. M STRONG.
C. F. SCHWEINFURTH, ARCHITECT, CLEVELAND, OHIO.

ISHING COMPANY.

PROPOSED BUILDING FOR THE PROVIDENCE TELEPHONE CO.
STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

Plans of a Nurses Home
for the RHODE ISLAND HOSPITAL
Providence, R. I

North Elevation.
Lockwood St.

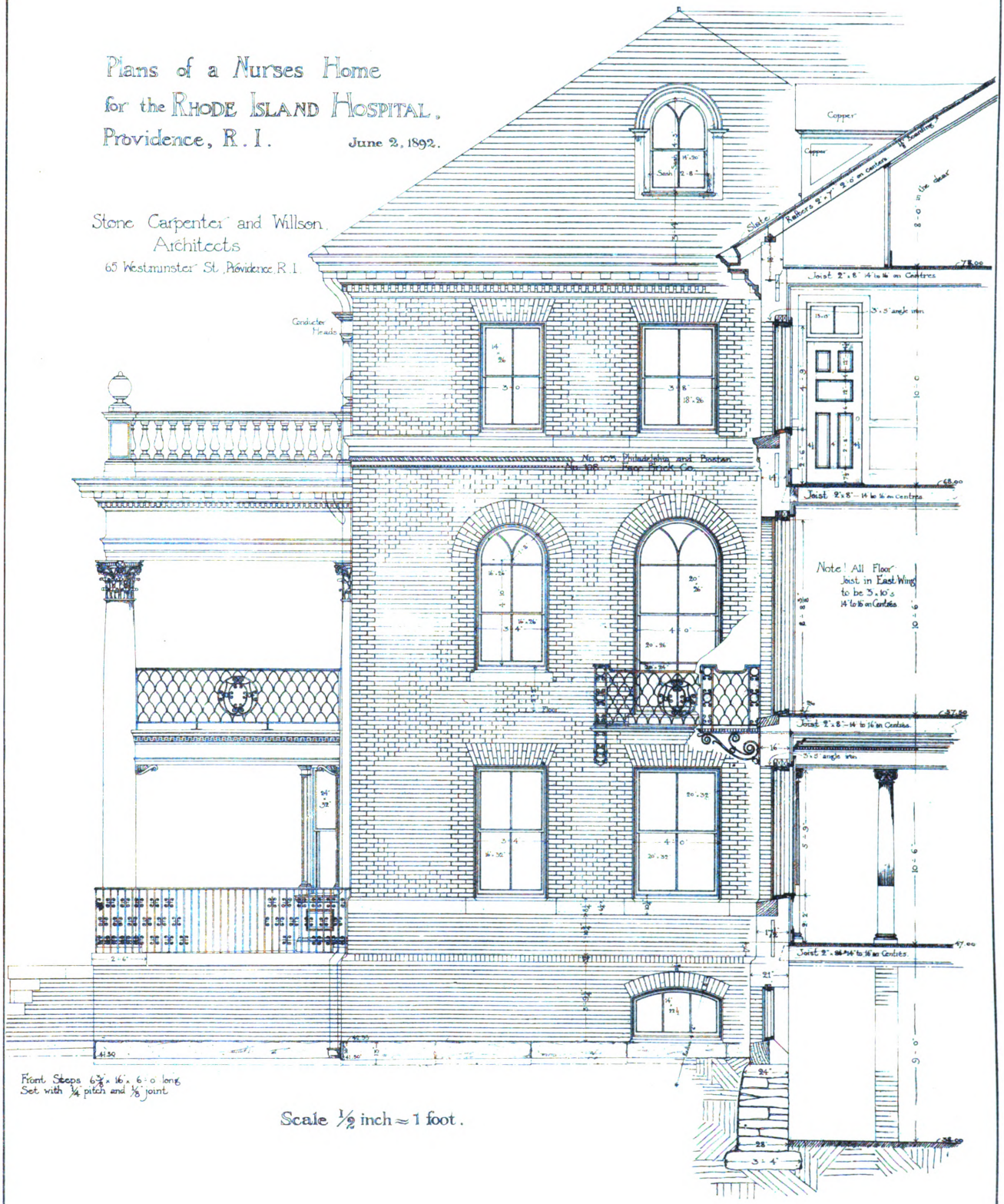
Scale 1/8 inch = 1 foot.

NURSES' HOME, R. I. STATE HOSPITAL.
ELEVATION.
STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

Plans of a Nurses Home for the RHODE ISLAND HOSPITAL, Providence, R. I.

June 2, 1892.

Stone Carpenter and Willson, Architects
65 Westminster St. Providence R. I.



Scale 1/2 inch = 1 foot.

NURSES' HOME, R. I. STATE HOSPITAL.
STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

PRIMARY SCHOOL HOUSE, ON GLEN ROAD, HILLSIDE DISTRICT.

E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON.

Trust Co., published in our issue for March, where a light brown is used with red to great advantage. There is just sufficient difference, without any hard contrast of light on dark, which we sometimes see.

Most architects must admit that if roofing tiles were more generally used a great improvement would be made in the architectural appearance of all our buildings. The tile is, firstly, non-combustible; it is enduring; it does not need paint, and it is a non-conductor of heat or cold; lastly, it is more artistic in appearance than slates or wooden shingles.

Some time ago the writer saw a house in the suburbs, the roof of which was covered with tiles imported from England. A well-known maker there has sent several shipments to this country and Canada. These tiles were of a very pleasing red color, and seemed to have been vitrified in the burning for they were as hard as iron.

I do not see why we cannot make as good tiles in this country, tiles that will be impervious to water and yet not brittle, so as to be damaged by frost. The color is also an important point, for there are some reds that never seem to tone down in the strong clear atmosphere of our climate. Even if we never used brick in building our suburban houses, but continued to use wood, it would be a great gain to have all our roofs covered with tiles.

But as time goes on we may learn to build more permanently, more on common sense principles. Then we will hope to see simple yet picturesque cottages in the outskirts of our cities built, it may be, with the commonest kind of brick, which our architects now know how to use, and that the clapboarded wooden house will become a thing of the past.

All that is needed is an awakened interest on the part of the public, and an opportunity for our architects to show how, with even the simpler and humbler forms of brickwork, the rural beauty of the country landscape may no longer be marred, but rather heightened and made humanly interesting by dwellings lovely in themselves.

ROBERT BROWN, JR.

BRICKS AND BRICKWORK.

A Lecture delivered at Carpenter's Hall, London, by Prof. T. Roger Smith, F. R. I. B. A.

(Continued.)

To make brickwork, however, another ingredient is required, namely, mortar or cement. All mortars and, in fact, all the cementing materials used (except bituminous ones) in bricklaying have lime as their base, and depend upon the setting quality of quicklime, which has to be mixed with sand, or some suitable substitute for it, to make mortars. Limes and cements are far too wide a subject to be dealt with as part of an evening's lecture on another topic, and no doubt they will hereafter form the subject of a lecture or lectures. To-night I propose only to remind you that there are such substances as these, and that they possess certain qualities and are obtainable and available for the bricklayer's purposes, without attempting an investigation into the chemistry of cements or the manufacture, etc. Ordinarily, brickwork may be divided into brickwork in mortar and in cement; but there are many qualities of mortar and several sorts of cement.

Mortar made with what are called fat or rich limes, that is to say, nearly pure lime, such as is got by calcining marble or pure chalk, sets slowly, with difficulty, and is rarely tenacious. Burnt clay or brick reduced to powder improves the setting of such lime, especially if the two materials be calcined together; so will an admixture of cement. Mortar made with what is known as slightly hydraulic lime, that is to say, lime containing a small proportion of clay, such as the gray-stone lime of Dorking, Merstham, and that neighborhood, sets well, and is tenacious and strong. Mortar made with hydraulic lime, that is to say, lime with a considerable admixture of clay, such as the lias lime, sets under water or in contact with wet earth. It is best to use this lime ground to powder, and not to mix so much sand with it as is used with stone lime. A sort of mortar called selenitic mortar, the invention of the late General Scott, has been made use of in many of the buildings of the school board for London, and was first employed on a large scale in the erection of the Albert hall. The peculiarity consists in the addition of a small dose of plaster of Paris (sulphate of lime), very carefully introduced and intimately mixed. The result is, that the mortar so made sets rapidly, and is very hard. It is claimed that a larger proportion of sand can be used with selenitic lime than with ordinary, thus counterbalancing the extra expense occasioned by royalty under the patent and special care in mixing.

The material which comes from the kiln is called quicklime, and, on being dosed with water, it slakes and crumbles to powder, and in the state of slaked lime is mixed up with mortar. Cement-stones are also calcined; but the resulting material will not fall to pieces or slake under water. It must be ground very fine, and when moistened sets rapidly, and as well under water as in air, and becomes very hard and is very tenacious. Brickwork in mortar will always settle and compress to some extent. Not so brickwork in cement, which occasionally expands, but is never to be compressed. This quality, and the rapid setting, tenacity, and strength of brickwork in cement make it a most valuable material to use in those buildings, or parts of a building where great steadiness and strength are wanted, and in sewage and dock work where there is water to contend with. A good many cements made from natural stones used to be employed such as Medina, Harwich, Atkinson's, or Roman cement. The last-named is the only one which is now much employed, except locally. It has the quality of setting with exceptional rapidity, and is on that account sometimes the best material to employ; but for almost every purpose the artificial compound known as Portland cement is preferable.

Portland cement is made largely near Rochester. Its materials are simple and cheap. They may, without much departure from the truth, be said to be Thames mud and chalk; but the process of manufacture requires care and thoroughness. The article supplied, when of the best quality, has great strength, and is quick setting, and is far better than what was manufactured from stones in which the ingredients existed in a state of nature. In England we slake our lime and make use of it while it is fresh; but it may interest you to know that the custom in Italy and parts of France is different. There it is customary to slake the lime long before it is wanted, and to deposit it in a pit and cover it up with earth. In this condition it is left for months — I believe in Italy for a year — and when taken out it is stiff, but still a pasty substance. It is beaten, and more water added, and it is then made into mortar with sand.

It is claimed for mortar made in this way that it is exceptionally strong. Now that we have considered bricks and partly considered mortar, it remains to pay some attention to brickwork. The simplest and most familiar work for a bricklayer to do is to build a wall. In doing this his object should be to make it as stout as possible for the thickness, and this stoutness can only be obtained by interlacing the bricks. If they were simply laid on the top of each other the wall would be no more than a row of disconnected piles of brick liable to tumble down. When the whole is so adjusted that throughout the entire wall the joints in one course shall rest on solid bricks and shall be covered by solid bricks again — in short, when the whole shall break joint — then this wall is said to be properly bonded, and has as much stability given to it as it can possibly possess. There are two systems of bonding in use in London, known as English bond and Flemish bond. English bond is the method which we find followed in ancient brickwork in this country. In this system a course of bricks is laid across the wall, showing their heads at the surface, hence called "headers," and next above comes a course of bricks stretching lengthways of the wall called stretchers, and so on alternately. With the Dutch fashions came in Flemish bond, in which in each course a header and a stretcher alternate. In either case at the corners a quarter-brick, called a closer, has to be used in each alternate course to complete the breaking joint. There is not much to choose between these methods where the walls are only one brick thick; but where they are thicker the English has a decided advantage, for in walls built in Flemish bond of one and a half brick thickness or more there must be a few broken bricks or bats, and there is a strong temptation to make use of many. If this takes place the wall is unsound.

Many of the failures of brickwork in London houses arise from the external walls, where they are 1½ bricks thick, being virtually in two skins. The inner nine inches does the whole of the work of supporting floors and roof, and when it begins to fail the outer face bulges off like a large blister. I have known cases where this had occurred, and where there was no header brick for yards, so that one could pass a five-foot rod into the space between the two skins and turn it about. This is rather less easy to accomplish with English bond; and there are other advantages in the use of that bond which make it decidedly preferable, and it is now coming back into very general use. There are some odd varieties of bond, such as garden bond and chimney bond; but of these I only wish to draw your attention to what is called cross bond. The name is not quite a happy one. Diagonal bond is hardly better. The thing itself is to be often met with on the Continent, and it is almost unknown here;

but it would be worth introducing, as the effect of it is very good. French cross bond, otherwise diagonal bond (*liaison en croix*), is English bond, but with the peculiarity that in every fourth course one header is made use of in the stretcher course at the quoin. The result is that the stretchers break joint with each other, and all the joints range themselves in diagonal lines; and if in any part of the work headers of a different brick are introduced, the appearance of a cross is at once brought out, and even without this the diagonal arrangement of joints is very perceptible and pleasing.

Besides wall-building the bricklayer has many other works to perform. He has to form fireplaces, flues, chimneys, and the flat trimmer arches which support the hearth, and has to set the stove, kitchen-range, copper, etc., in a proper manner. He has to form various ornamental features and much else, some of which we shall have an opportunity of noticing rather later. The strangest business, however, which is intrusted to the bricklayer, is building downwards by the method known as underpinning, so that if a foundation has failed, a sounder one at a greater depth may be reached; or if a basement is required under an existing building which has none, the space may be excavated and the new walls built so as to maintain the old. This work has to be done with great caution, and bit by bit, and is usually left to experienced hands. The mode in which the mortar joints of a brick wall are finished where they show on the external or internal face, is a matter worth a moment's attention. It is important that the joints of the work shall be so finished as to keep out wet and to be as durable as possible, and it is desirable that they should improve, or, at any rate, not disfigure the appearance of the work. The method which architects strongly advocate is, that the joints shall be struck as the work proceeds, that is, that very shortly after a brick is laid, and while the mortar is yet soft, the bricklayer shall draw his trowel, or a tool made for the purpose, across it, to give it a smooth and a sloping surface. This is best when the joint is what is called a weather joint, *i. e.*, one in which the joint slopes outward. Sloping it inward is not good, as it lies in wet; finishing it with a hollow on the face is often practised, and is not bad. Bricklayers, however, most of them prefer that the mortar joints should be raked out and pointed, that is to say, an inch or an inch and a half of the mortar next the outer face be scratched out and replaced with fresh mortar, and finished to a line. In cases where the brickwork is exposed to frost this proceeding cannot be avoided, because the frost damages the external mortar of the joints; but the bricklayers prefer it at all seasons of the year, partly because brickwork is more quickly done if joints are not struck at the time, partly because they can, if they like, wash the whole surface of the work with ochre or other color, to improve the tint, and partly because whether the washing is done or not it smartens up the appearance of the work. The misfortune is that this pointing, instead of being the edge of the same mortar that goes right through, is only the edge of a narrow strip, and does not hold on to the old undisturbed mortar, and so is far less sound and far more liable to decay. There is a system of improving the appearance of old decayed work by raking out and filling up the joint, and then making a narrow mortar joint in the middle of this filling in and projecting from the face. This is called tuck-pointing; it is very specious, but it is not sound work.

Brick arches are constantly being turned, and of many sorts. An arch consists of a series of wedge-shaped blocks, known as voussoirs, arranged in a curve, and so locking one another together that, unless the abutments from which the arch springs give way, it will not only carry itself but sustain a heavy load. It is a constant practice to cut bricks to this shape and build them into an arch, and these are sometimes cut and rubbed. Sometimes when the work is rougher, they are axed; but in order to save the labor of cutting, arches are sometimes turned with the bricks left square and the joints wedge-shaped. In this case the rings should be only half a brick each, so that the wedge need not be so very much wider at back than at face, and they are set in cement, as that material adheres so closely and sets so hard. Arches of two or more half-brick rings in cement are good construction, and are also used for culvert work. A less satisfactory sort of arch is what is called the flat arch. Here, instead of being cambered as it ought to be, the soffit is straight; but the brickwork being deep, there is room enough for a true arch that does the work, and for useless material to hang from it. These arches are generally rubbed or axed, and are very common at the openings of ordinary windows; but no one who has studied construction can look at them without a kind of wish for at least a slight rise, were it only two inches. Sometimes when these straight arches are to be plastered over, they are constructed in a very clumsy manner, which is anything but sound, and from time to time they give way. The weight of brickwork, of course, varies with the weight of the individual bricks; but stock brickwork in mortar weighs just about one hundred weight per cubic foot, or twenty cubic feet to the ton. In cement it is heavier; about 120 pounds to the cubic foot. The strength of brickwork depends, of course, on the strength of the weakest material, *i. e.*, the mortar; though when it is in cement the strength of brickwork to withstand a weight probably approaches that of the individual bricks. Some experiments quoted in Rivington's notes give the following as the crushing weight per foot; that is to say, weight at which crushing began, of piers having a height of less than twelve times their diameter: —

	Tons per foot.
Best stocks, set in Portland cement and sand, 1 to 1, and three months old	40
Ordinary good stocks, three months old	30
Hard stocks, Roman cement and sand, 1 to 1, three months old	28
Hard stocks, lias lime and sand 1 to 2, and six months old . .	24
Hard stocks, gray chalk lime and sand, six months old . . .	12

The rule given in a popular handbook, that brickwork in mortar should not have to carry more than three tons per superficial foot, and in cement more than five tons, is probably sound, as in no building ought the load to approach the crushing point, and indeed there are many sorts of foundations on which such a load as five tons per foot would be too great to be advisable. It is a rather interesting inquiry, whenever we are dealing with a building material, if we ask what can we best do with it, and for what is it ill fitted. The purpose for which brick can be best used depends, of course, upon its qualities. Speaking generally, such purposes are very numerous, and very various, especially the utilitarian purposes, though rich and varied ornamental work can also be executed in brickwork. Perhaps the most remarkable quality of brickwork is that it can be thrown into almost any shape. It is in this respect almost like a plastic material, and this peculiarity it owes chiefly to the very small size of each brick as compared with the large masses of the brickwork of most buildings. Stone is far less easily dealt with than brick in this respect. Think for a moment of the great variety of walls, footings, piers, pilasters, openings, recesses, flues, chimney breasts, chimney shafts, vaults, arches, domes, fireproof floors, corbels, strings, cappings, panels, cornices, plinths, and other features met with in constant use, and all formed by the bricklayer with little trouble out of the one material — brickwork. A little consideration will convince you that if the same material furnishes all these it must be very plastic. As a limitation we ought to note that this almost plastic material cannot be suddenly and violently dealt with — that is to say, that with the exception of some sorts of arches, you cannot form any abrupt or startling feature in brickwork, and you are especially limited as to projections.

If you wish to throw out any bold projection, you may support it on a long and sloping corbel of brickwork; but if there is not room for that, you must call in some other material, and from the actual support in stone or terra-cotta or iron, and when you have gained your projection you may then go on in brickwork if you like. Brick cornices should be steep, but cannot be bold, and so with other ornamental and structural features. A noteworthy property of brickwork, and one of immense value, is that it is thoroughly fireproof; in fact almost the only perfectly fireproof material.

There is an interesting account of the great fire of London by one of the eye-witnesses, and among the striking phenomena of that awful time he notes that the few brick buildings which existed were the only ones able to withstand the raging fire when it reached them. In our own day a striking proof of the same thing was given in the great fire in Tooley Street, when Braidwood lost his life. I witnessed that conflagration for a time from London Bridge, and its fury was something not to be described. There were vaults under some of the warehouses stored with inflammable materials, the contents of which caught fire and burnt for a fortnight defying all attempts to put them out; yet these very vaults, though they were blazing furnaces for all that time, were not materially injured. When the warehouses came to be reinstated, it was only found necessary to repair and repoint them a little, and they were retained in use. The fact is, that the bricks have been calcined already, so has the lime in the mortar, and the sand is not affected by heat, so there is nothing in brickwork to burn.

(*To be continued.*)

"STOCKS" VERSUS "GAULTS."

A correspondent to one of our English contemporaries writes as follows concerning the London market:—

"The increasing adoption of 'gaults' must be affecting many fields where the good old 'stock' is the staple article of manufacture. This increase must have been noticed by very many. The future promises to see a still further development. Frequently now, the gault is usurping the place of picked stocks for facings, and for inside work gault bricks seem to be almost ousting the stock from the market. This cannot but be felt severely in quarters where gault clay does not occur. The question then arises, Why the neglect of the stock? Builders say they cannot now get good sound stocks as of yore, and that a front of picked gaults is equal to a front of picked stocks, which may be true as regards evenness of color, but scarcely so with respect to durability. There is too much flake about the gault, and the quality of the brick varies greatly. To my mind, nothing equals in effect and durability the old-fashioned, well-made, well-dried and turned hand-made stock; but such bricks seem, unfortunately, to be becoming unknown in London, and the machine-made, pale-faced gault daily more in use. I suppose it is all a question of pounds, shillings, pence.

"One may imagine, therefore, that what with the still raging red-brick fever, and the rise and progress of the gault, the poor old stock is hard driven. Seeing that it is no good at all for facings in dirty, sooty London, and that even if it were, the red brick would cut it out in nine cases out of ten, and seeing, further, that the gault is now used generally for backings and internal walls, the demand for stocks in London must be a fraction of what it was some years ago. Locally, in the country, the stock may still reign supreme.

"When an architect chances upon a job in a district where really excellent stocks are procurable, he should try his hand at something artistic with stocks for the main facings. So great has been the rage for red brickwork in country and town, that the admirable effects to be obtained from stocks, when of sound texture and of bright golden and orange-gray hues, seem to be in danger of ranking among the lost arts. Occasionally we find a building in which the capabilities of the humble stock have been developed. In the country, the stock remains clean and bright, and instead of blackening, as in London and other smoky cities, grows mellow with age. The depressing hue of old stock-brick fronts in London is enough to make architects, who may be so fortunate as to live in view of a prospect mostly composed of such, forswear forever the use of such bricks for facings; but in the country the native stock would often be capable of more effective treatment than the results of attempts at red-brick making with miserably unpromising materials."

For those of our readers unacquainted with the terms used in the English brick market, we offer the following explanation, based on the classifications given in the South Kensington notes on Building Construction, the standard authority.

"*Stocks*" are hard burned bricks, fairly sound, but more blemished than "shippers," which are chiefly exported, ships often taking them for ballast. They are used for the principal mass of ordinary good work. "Hard stocks" are overburnt bricks, sound, but considerably blemished both in form and color. They are used for ordinary pavings, for footings, and in the body of thick walls.

"*Gaults*" are made from a band of bluish tenacious clay which lies between the upper and lower greensand formations. This clay in its natural state contains sufficient chalk to flux the mass, and to give the brick a white color. The bricks made from this clay are of a very good quality, extremely hard throughout, very durable, but difficult to cut. They are generally white, but the lower qualities have a pink tinge caused by irregularities in burning. Bricks made from gault clay are generally very heavy. To remedy this a large frog is sometimes formed in the brick, or it is perforated throughout.

CORRESPONDENCE.

BLUFF SPRINGS, FLA.

THE BRICKBUILDER PUBLISHING CO.

Gentlemen,— I am in receipt of a specimen copy of your very excellent monthly magazine. I have been in the brickmaking business over sixty years, in four of the Northern States and seven of the Southern States. I have also done a great deal of building, being a brick layer as well as brick maker. Perhaps no man living has had so long and so varied an experience in brick and brickwork. I look back when my trade and calling stood at the very foot of the mechanical arts, without a single voice, and I may say capability, to say a word for it, and now with great pride and real pleasure I look out at the marvellous transformation, at all parts of our country, in the clay-working line. I see capital, intelligence, invention, and literature at the head of it, with a combined interest and purpose, and I may say ability, to make our craft second, in importance and progress, to no other in the United States.

I congratulate you on your excellent object and appearance. You will fill a gap that none of your contemporaries can well do, viz. Show us how to build a brick house as well as to make the brick for it. I have written nearly three years for *The Clayworker*, and am perhaps the only writer for that journal that has said anything about brick laying and building. In my humble opinion, the whole business of brick building, as well as city building, requires revision and improvement, and I am glad to see that you have made a specialty of this very important part of our building industry. I do not think we build in our cities to suit either the true laws of health and economy, or to produce the best effect in architectural beauty. I think you should *declare war* on narrow streets and very high buildings, as well as on all kinds of tentative showy work inconsistent with strength, utility, durability, and symmetrical proportions. The idea of building a house four or five times higher than its width, just to get in a profusion of architectural enrichments, is absurd. There is a question of political economy (in the abstract) connected with our very bad, imperfect system of building, in which the general public have some interest and implied rights. Fireproof, health, and morals are subject-matter for the public to consider in giving building permits. Very truly yours,

J. W. CRARY, SR.

HARTFORD, CONN.

BRICKBUILDER PUBLISHING CO.

Dear Sirs,— In your notice of brick church design, you say it would look best with red brick having wide joints of white mortar. Why white, instead of dark red or brown? Wouldn't the latter give a richer effect, bringing out each brick by forming a shadow line all around it?

The old usage in brickwork was the jointing in mortar, which always gave a raw, glaring effect. It was seldom satisfactory (except when very narrow joints were used) till after many years had dirtied the white lines, and brought them more into harmony with the mass.

Yours respectfully,

W. P. CRABTREE.

Our fields of good clay were never given us to be made into oblong morsels of one size. They were given us that we might play with them, that men who could not handle a chisel might knead out some expression of human thought. In the architecture of the clay districts of Italy every possible adaptation of the material is found exemplified, from the coarsest and most brittle bricks used in the mass of the structure to bricks for arches and plinths cast in the most perfect curves and of almost every size, strength, and hardness; and moulded brick wrought into flower work and tracery as fine as raised patterns upon china. And just as many of the finest works of the Italian sculptors were executed in porcelain, many of the best thoughts of their architects were expressed in bricks, or in the softer material of terra-cotta; and if this were so in Italy where there is not one city from whose towers we may not descry the blue outlines of the Alps or Apennines, everlasting quarries of granite and marble, how much more ought it to be so among the fields of England?—*John Ruskin in Stones of Venice.*

SELL MORE BRICKS.

AN OPEN LETTER OF SUGGESTION TO BRICKMAKERS.

Which is harder; to make bricks enough to fill your orders, or to sell all the bricks you can make? Can you not make more bricks than you can sell? If there were a market for twice your present output, would you not double your plant and force of workmen? Certainly you would, — if you have the clay to use, and can make bricks at a profit. Now why not double your market? You have the best building material in existence; yet you stand by and see three quarters of the building done with wood or stone. Why not work to increase the number of buildings built of brick and decrease those of stone or wood? You can do it, and it is money in your pockets.

Do you know that there are several publications devoted to designs and details for frame buildings, that these publications are taken by lumber dealers, and sash and door makers, distributed by them among their customers, shown to contractors, to people about to build? Do you also know that prior to this year there was not a single publication in the world devoted to brick architecture, to showing plans and details for brick buildings, to publishing information about bricks and brickwork? There were several good journals devoted to making bricks, but none to making a larger and better market for them. THE BRICKBUILDER is the only periodical in the world devoted to this important interest of brickmakers. Is it not quite as important to *sell* bricks as to *make* them? What good is your business without its market? The larger this market, the better the business. You may say that bricks must be *made* before they are *sold* — that we are "putting the cart before the horse." Not by any means. There is not a brickmaker in the country that does not consider his market before he does his means of supplying it. There is not one of you who would make bricks without a market in view — therefore the *selling* is the first and *most important* consideration. THE BRICKBUILDER proposes to help you sell more bricks. To do this you must meet it half way; without your doing your part it must be slow work. Our part is this: We are publishing designs of brick, or brick and terra-cotta buildings, showing what the leading architects in all parts of the country are doing; we publish photographs of brickwork that has been done in Europe in times past, giving, as every one knows, valuable ideas for modern work; we publish details to scale, of arches, cornices, chimneys, fireplaces, and similar features, designs of storefronts, houses, churches, schools, stables, etc., of direct use to the architect and builder; we publish articles showing what is being done in different American cities, illustrated by drawings and photographs, articles calling attention to the strength and durability to the fire resisting qualities of brick and other clay building materials; articles suggesting artistic treatment of brickwork, etc., etc.

Now to return to our original subject, *i. e.*, the selling of more bricks. How will you do it? In the first place, don't let any one build a wooden building if you can help it. Fight for the use of brick in every way; and in this fight you will find no better weapon than this paper. Subscribe to it, — it costs but a nominal price per year, $2.50, — keep it in your office, read it, examine the designs, and see in how many ways and how many times during the year it will pay for itself.

As a simple instance to illustrate its use: John Smith is building a store. Its front is to be of brick, but he thinks, in fact he has about decided, to put a galvanized iron or wooden cornice on it. *Don't let him do it.* In the first place it will not last so long, and if there is a fire near by the wooden one may have to be replaced if it does not help burn down the whole store. It must be painted every little while. If it is at all ornamental it is more costly, and *last, but not least, it doesn't do you any good.* If you induce him to use a brick cornice it means adding another thousand or more bricks to the order. It is easy to induce him — he uses wood or sheet-metal to get an ornamental effect he thinks he cannot get with bricks. A few copies of THE BRICKBUILDER will show him beautiful cornices of all styles and of varying degrees of ornateness. In fact, the next number will contain some fifty or more designs for cornices. Ten to one he will find a design he prefers to the iron or wooden one. You have scored a point. If you are progressive, if you are awake to business, you can score points like this every week; you can get bricks used where they were not contemplated, *and you can sell these bricks*, and remember that is what you are in business for.

A subscription to THE BRICKBUILDER costs $2.50 a year. Besides the general information in regard to brickwork that it brings you every month, it gives one hundred sheets of practical designs and details during the year, a large number of small illustrations, and twelve beautiful supplements. When you have examined a copy, if you do not want to keep it, give it to some mason builder, or to some person who is about to build; it will do good work for you. We urge you to try this plan for a year. Send us your check for $2.50, together with your full address, and you will receive the paper one year sent *flat* not *rolled*. In support of this request let us call your attention to a few letters from prominent brickmakers, reprinted on the inside page of the back cover of this number. If you would like to supply all your regular customers with complimentary yearly subscriptions, — one of the best advertisements, by the way, you could get, — write us for our special terms, stating number of copies wanted. On such orders we make liberal discounts.

THE BRICKBUILDER PUB. CO.

THE BRICKBUILDER COMPETITIONS.

RULES: All drawings must be sent in marked with some motto or device, and accompanied by a sealed envelope marked with the same, containing the full address of the competitor. The designs are judged by a committee of well-known architects, solely upon their merits, the names of the designers remaining unknown until the award is made, when the sealed envelopes corresponding to the devices on the designs are opened. To protect the interests of our advertising patrons it is stipulated that no ornamental bricks not found in their catalogues shall be used. This is really no restriction, for practically all of the leading manufacturers will be found represented in The BRICKBUILDER. To encourage the study of effective use of the commoner materials, of two designs equally good, preference will be given that showing a skilful use of ordinary bricks to secure ornamental effect.

The results of competition No. 3 will be published in the next issue. We are glad to state that not only many more designs have been sent in, but that they are of better quality throughout. We submit below the programme for the sixth competition, and again urge all designers to enter.

COMPETITION NO. 6.

AN ARCHED WINDOW OPENING.

Programme. It is required to design one of a series of round arched windows in the façade of a building, the window opening to be three feet wide from brick jamb to brick jamb, and six feet high from top of sill to soffit of arch at its crown. The window is to be entirely surrounded by a plain wall surface. The sill may be of terra-cotta or stone, or bricks laid in cement. The ornamental work may be carried wholly around the opening or confined to the arch. Two colors may be used, if desired, and in that case the designer referred to the rendering of plate 10, No. 2 of THE BRICKBUILDER, where the light portions are masked by paper cut to the desired shape, and then the spatter work done by using a stiff brush, like a tooth or nail brush. Drawings are to be made in elevation, to a scale of three quarters of an inch to the foot, upon Bristol-board or some other *smooth surface* paper. *Do not use cold-pressed Whatman.* They must be delivered *flat*, postage or express prepaid, at the office of THE BRICKBUILDER, 4 Liberty Square, on or before Sept. 15, 1892.

Prizes will be awarded as follows: First prize, $5.00; second prize, $4.00; third prize, $3.00; fourth prize, $2.00; five fifth prizes of $1.00 each. THE BRICKBUILDER reserves the right to publish any or all the designs submitted.

THE ILLUSTRATIONS.

Plate 41. Examples of Modern English Brick and Timber Architecture. See article on page 43.

Plates 42 and 43. Designs for Brick Mantels. C. F. Schweinfurth, Architect, Cleveland, Ohio.

The perspective of this building was published in the February BRICKBUILDER. The plate in the present number reproduces the three-quarter scale detail.

Plates 44 and 45. The building for the Bell Telephone Co., at Providence, R. I. Stone, Carpenter & Willson, Architects.

Plate 46. Building for the Nurses' Home, Rhode Island State Hospital. Stone, Carpenter & Willson, Architects.

Plate 47. Three-quarter scale detail of above.

Plate 48. Glenn Road School, Jamaica Plain, Mass. Edmund M. Wheelwright, City Architect, Boston.

THE BRICKBVILDER

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The editors feel much encouraged by the successful outcome of THE BRICKBUILDER competition for cornice designs, and hope that the happy augury will be fulfilled in the contests which are to follow. Certainly these designs show that there is no lack of ability or fancy among our younger designers. It often happens, indeed, that our architects are more successful in handling a piece of detail than in the designing the mass of a whole building. Yet the principles of design are the same in both cases. If we can only learn the dignity of restraint and the beauty there is in simplicity of design, if we only can come to realize the importance of right proportions of mass as well as of detail, and if we will only have the patience to give to our designs the careful study they deserve, there is every reason to hope for the best for our architecture. By means of good designs we shall gradually educate and elevate the public taste. At present the public, more than the designers, are to blame for the ugly, insipid, and restless buildings which so often disfigure our streets. There are enough good designers to cover the country with the best designs, if the public only had the appreciation to employ them.

It too rarely happens that our brick masons have any proper appreciation of their own work. To lay a given number of bricks in a given time is generally the highest ambition of the most conscientious, and under the *régime* of the trades unions to lay as few bricks as may be in a given time seems generally the result aimed at. We regret to think that the trades unions are largely responsible for the deterioration in the quality of our workmen. In most cases they directly encourage incompetence. Only recently the following case came to our notice: A bricklayer was at work laying a portion of wall of somewhat difficult and complicated design. It needed a man not only skilled in his work, but one who had some appreciation of the beauty of what he was at work upon, one who would take a pride not only in doing his best from a mechanical point of view, not only in producing what would be called a "workmanlike job," but one who would take some pleasure in following the design he was executing and seeing that it came out well. The fellow that was engaged upon this piece of work, so far from being what we have described, was not only indifferent and careless, anxious only to make time, but was utterly incompetent.

The difficult piece of work he was upon had to be pulled down, it was so badly executed. The foreman, having some pride and conscience in the matter, removed the incompetent workman, not from the job altogether, but merely to another part of the work, where he would have plain sailing and less chance for mischief. At once all the other bricklayers declared that that bricklayer must be put back or they would "strike." Explanation proved useless, and to avoid stopping the work altogether, the botcher had to be set to spoiling his work a second time. This is no unusual instance of the way in which the unions encourage bad work and bad workmen. The unions, properly conducted, might raise instead of lowering the standard of work, and might thus be of the greatest benefit, not only to the men, but to the trade. The true interests of no good workmen are advanced by the present methods, the tendency of which is to prevent men from rising where they deserve to rise.

Notwithstanding the fact that America is essentially a timber country, the merits of brick as a building material are rapidly becoming better understood. Experience has shown that the durability and strength of brick make its use cheaper in the end, although the first cost is greater than that of timber.

The extent to which brick was used in the erection of the cheaper class of buildings, where the choice was between timber and brick or stone, has heretofore been largely dependent upon geological conditions. In such places as Philadelphia and St. Louis, where an abundance of excellent brick earth is found, the majority of buildings have been erected in brick, as in the nature of things; but with the rapidly increasing facilities for the shipping of freight, brick will be used in places remote from the brickmaking centres, and that too in the commonest description of buildings.

In the erection of buildings where low cost is a *sine qua non*, timber is often employed to the exclusion of brick, simply because to use the latter, and at the same time keep the cost within the prescribed limits, would mean using bricks of very inferior quality, and these would not last much longer than timber. There is a way of using good bricks, and yet of keeping the cost low, and that is by employing hollow bonds.

These bonds can only be used in one-brick walls. There are two methods of laying them. The first is to lay all the bricks on edge, laying first a header and then a stretcher, and so on throughout the course. The course above is laid exactly in the same way with the headers in the centre of the stretchers below them; the ends of the courses being closed up with closers of the necessary length. The second method of forming hollow bond is first to lay a course of headers, and then upon it a course of stretchers on edge. This is followed throughout the wall, there being headers flat, and stretchers on edge alternately.

Both systems of laying brick produce a fairly strong wall that will safely carry all ordinary weights. For fence walls they may be used with advantage, and for a number of other purposes may be safely employed.

Hollow bonds are not recommended to take the place of solid walls, excepting where it is necessary to keep the cost low, and where it would be necessary to use an inferior brick if the wall were built solid. Hollow walls erected of good bricks are much superior to solid walls constructed of poor bricks.

The June number of *Scribner's Magazine* has an interesting article on "Life in New York Tenement Houses," by William T. Elsing. We do not refer to this with the intention of perpetrating any such incongruity as the discussion of social questions in a

technical journal, but in order to point out an incongruity still more ridiculous, if it were not so saddening, which is too often perpetrated, not only in New York, but in other of our large cities. In the course of the article we refer to is an illustration, entitled "A New Tenement House of the Better Sort." It shows an ugly, pretentious brick building overloaded with hideous terra-cotta, which we suppose its architect would call ornament. What heartless irony the erection of a pretentious monstrosity such as this for the occupation of poor people, who doubtless have increased rent wrung from them to pay the interest on the cost of the ugly and elaborate detail! Could there be a more striking example of the want of taste, the absence of any sense of fitness, the craving for mere display, the heartless vulgarity which is characteristic of certain elements in the community? There is no possibility of any permanent and vital progress in art until the characteristics exemplified in such buildings as this cease to be conspicuous traits of the public character. We admit that this is an extreme example, but is unfortunately not an uncommon one, and we refer to it because we think the want of taste here shown, the incongruity, are more palpable than in many other instances which perhaps are really just as bad. It is easy here for any one to point the moral to the tale, and the vices of such a building as this bring out in stronger relief the desirability of the opposite qualities. A decently plain, strictly utilitarian building, whose effect should depend on pleasant proportion and mass, and relation of voids to solids, and whose detail should be of the very simplest, all in plain brick, would not only be more appropriate for a tenement house, but could not fail to be less ugly, and might even have a certain beauty. Certain it is that it is useless to attempt elaborate beauty in our architecture until we can appreciate the beauty there may be in perfectly simple design, until display ceases to be regarded as synonymous with beauty, until there exists a delicate feeling for the fitness of things, which is shocked at the incongruity as well as the ugliness of such buildings as we have referred to.

In considering the respective merits of different systems of bonding, there is one rule that may be invariably applied, and that is the extent to which the vertical joints come over one another. In a perfect bond no two joints will come over one another in any part. To understand this, imagine that a knife is thrust down vertically between a mortar joint. If the bond is a perfect one, the knife can only descend one course without striking a brick, while in less perfect bonds it may go the whole length of the wall. In running bond that is commonly used in the United States, the knife could be thrust down four, six, or eight courses, depending upon the extent to which headers were used.

OF INTEREST TO MASONS AND BUILDERS.

Any of you can build a plain wall and build it well. If you can't, there is no use in reading further. What follows is for the progressive, wide-awake builder, who takes every chance to get ahead. Then let us repeat, any of you can build a plain brick wall. Every wall has a top, and some walls have holes in them; in fact most of them do. When a wall is in a building, its top is a cornice, its holes are doors and windows. Very often the party you are building the wall for wants some ornament on it, and you use your bricks to produce patterns that will make the doors, windows, and cornice more attractive. Where do you get your ideas? From some other builder in your town? If so they are second hand. Do you get them up yourself? If so they cost you lots of time. Time is money, and if you can buy these for about a hundredth of what your time costs you, you are a big gainer. Perhaps your first ideas do not suit the owner. Then you must spend more time. Suppose, now, you are building a store front: you are up to the cornice, and the owner wants to know what it is going to be; perhaps you yourself haven't had time to decide just how you will make it. But you have a book of designs, for instance, this copy of THE BRICKBUILDER. You take it to him and say, "Here are forty-five ideas; which do you like best?" If he can't find one he likes, he is hard to suit. Suppose, though, you are only up to the windows of the second story, you must get up an idea, *unless* you take this paper regularly. If you do you will find designs for dozens of windows among the hundred or more plates of designs published each year. You may want a cornice, a door, a window, a string course, a panel, a fireplace, an outside chimney, or a simple chimney-top; you are almost certain to find a lot to choose from in some number of this paper. Take the case of a chimney-top; you may know how to build only one kind, but if you can build twenty-five, fifty, or one hundred kinds, don't you stand a better show of getting the chimneys of a frame building to build than a mason builder who knows only one or two patterns?

Every trade has its papers, except that of bricklaying. Carpenters have dozens of publications containing designs for all kinds of frame buildings and all kinds of wood details. The dressmaker has her papers showing new patterns for dresses, and she can show these to her customers for them to select what they wish. And so on through all lines of business. The mason builder whose work, when well done, is the best, the most durable, and, in the end, the cheapest, had nothing of the kind until THE BRICKBUILDER was started. It is the only periodical in the world devoted to mason builders' and contractors' work. It is worth its cost to them many times over.

These are its strong points: It is published monthly, and contains every year 100 or more full plates of practical designs and details for brick buildings. Besides details, it publishes working plans and elevations for all sorts of brick buildings. Some of these are actually built by prominent architects, others are the result of competitions for prizes, as the cornices in this number are. The next number will contain designs for chimney-tops and windows, as this one does of cornices. Then will come other details, and a little later, a number full of designs for $2,000 brick houses. We had just decided to offer prizes for designs for a brick house, when we received the very timely letter from Savannah, Ill., reprinted on page 54.

Right here let us say that this paper is in no way intended to supply the services of practising architects. Where the services of a good architect are obtainable, THE BRICKBUILDER advises owners to employ him, and pay for his services at their full value. It will be money in the owner's pocket to do so. But in all small towns and in many cities much work is done where professional service is not easily obtainable. To those builders who are often obliged to work without an architect's guidance in such cases, THE BRICKBUILDER is invaluable.

For a year this paper costs only $2.50. Besides its practical designs and details, it contains much interesting and valuable reading matter. Its numbers are always useful. You can keep this number, and find use for these designs of cornices next year, or the year after, as much as at the present. At any time the companies whose bricks are to be used will quote you prices if you write them as directed on page 54. If you think this number is worth saving, you would think the same of every number. Send $2.50 for the whole year of 1892, including back numbers, or $1.25 for the last six months of the year. We have only a few complete sets; each number is full of useful things, and worth many times the cost. The April number, for instance, contains designs for arched doorways, also two-story brick store fronts. The May number, plan, elevations, and details for a brick church.

By sending $2.50, you get the paper beginning with the first number, and so get all the designs published. If you get this paper rolled, remember only sample copies are sent rolled; all subscribers get their papers flat, sent through the mails protected with pasteboard.

THE BRICKBUILDER PUBLISHING CO.
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DRAWINGS OF ENGLISH BRICKWORK.

The majority of architects in this country are well acquainted with the interesting brick and terra-cotta work Messrs. Ernest George & Peto have been doing in England. These architects stand among the very foremost for good domestic work, and their work has widespread reputation. We have just received some scale drawings of a number of their best buildings, including Shiplake Court. These drawings will be published in early issues of THE BRICKBUILDER.

THE STRENGTH OF MORTAR.

Some years ago a peculiar accident happened in New York City. A building used for the storage of flour fell down one Sunday night without any apparent cause. The writer went to the site of the fallen building early the next morning and made a careful inspection. The front wall had fallen bodily into the street, carrying with it the greater part of the side walls, but leaving the back wall intact. Barrels of flour, bricks, and mortar were all mixed together in confusion. On looking at the bricks it was found that they were of very good quality; they gave out a good, clear ringing sound when struck together, and appeared to be in every way of first-class quality. The mortar, however, was evidently very inferior. Portions of it taken between the thumb and finger could be crushed with very little pressure. The heap of *débris* was suggestive. Hardly two bricks could be seen clinging together; many of them were as clean as the day they were laid, while the mortar, in amongst the rubbish, was nearly all in a state of powder. It was not difficult to arrive at the conclusion that bad mortar was in some way responsible for the fall of the building. Inquiry of the owner of the place brought to light these facts: First, that the usual custom of storing barrels of flour was to arrange them on their sides, one on the top of the other, in the form of a pyramid; second, that on the day of the accident a larger number of barrels than usual had been received, which had rendered it necessary to fill up the whole of the building to the walls.

The writer quickly made up his mind that the accident had occurred primarily in consequence of bad mortar being used in the construction of the brickwork; that the walls were strong enough to stand so long as the weight was placed directly upon them as a dead load as it was when the flour barrels were arranged in pyramidal form, but that as soon as they were packed up solidly, they exerted a side pressure on the walls and so sent the front wall, which had no support, into the street. The building referred to was situated just below the Brooklyn bridge, and it was plain enough how the vibration of the cars had caused the barrels to slip and to thrust out the wall.

Accidents, where the cause can be so readily ascertained, are, of course, rare; but it is doubtless a fact — and one of which the writer, personally, has no doubt whatever — that when brick buildings fall, the fault is due, in nine cases out of ten, to imperfect mortar. It should be remembered that there are no better bricks made in the world than in the United States; in fact, no other country approaches even nearly to the degree of perfection which the American manufacturer of bricks has reached. The same cannot, however, be said of brickwork, because both the bond and the mortar are often so defective.

Perhaps brickbuilders, as a rule, do not sufficiently realize the importance of using hydraulic lime or cement in mortar. Entirely too frequently pure lime that possesses no hydraulic qualities whatever, and is fit only for inside plastering, is used to the serious detriment of the strength of the building. The nomenclature of limes divides them up into two classes, — the pure or fatty limes, that consist of pure carbonate of lime and yield a quantity of steam and heat in slaking, and the poor, meagre, or hydraulic limes that have some silica, alumina, iron, and other foreign substances in their composition, and possess the property of setting under or in the presence of water. Pure limes dissolve more or less in water, and will not set in damp situations. The terms "poor" and "meagre" applied to hydraulic limes arise from the cold appearance they possess when mixed with water in contrast with "fat" limes that have a distinctly oily or unctuous look.

Now it will readily be seen that it is necessary that mortar, to be good, shall be made only from a lime possessing some not inconsiderable hydraulic properties. While limes are divided up into two classes as above stated, they range in degree all the way from one to the other; that is, there are limes that contain only a little hydraulic qualities which would be ranked in the general class of pure limes, and so on up to those that were distinctly hydraulic in composition. The important thing for the brickbuilder to remember is, that the greater hydraulic properties his lime possesses, other things being equal, the stronger will be the mortar. Cement is essentially hydraulic, and when a lime is used that lacks or is deficient in hydraulic qualities a proportion of cement should be added. In this case it is a good plan to mix the mortar in large quantities so as to give a chance for the lime to slack perfectly. A thorough admixture is very necessary, and it is for this reason that mortar-making machines are successful. The expression sometimes used by laborers making mortar of "drowning" it, when too much water is added, is a very expressive one; no more water should ever be used than is necessary to thoroughly wet the whole mass.

Of course sharp, clean sand or its equivalent is necessary. Sea sand may be used with hydraulic cement or lime if the wall is to be under water, as the salt is in that case no objection. There are several substitutes for sand; for instance, ground coke, slag, stones, or brick. Perhaps the best substitute is burnt clay ground to a sufficient fine.ess. This makes a very strong mortar.

The impo tance of making mortar as strong as possible can be best understood when it is taken into consideration that there are other strains in an ordinary building than that of a direct crushing weight. Even good mortar is very weak when subjected to a tensile or pulling strain, and its greatest strength is in resisting a crushing load. In ordinary buildings the roof exerts an outward thrust on the walls, in many cases, while the joists, bending under the weight put upon them, have a tendency to some extent to pull the wall in. Then, again, the pressure of wind is considerable at times, and puts a tensile strain on the mortar that must be provided for. In short, the mortar used in the construction of a piece of brickwork is of a necessity the weakest part of the structure, and should be made as strong as it is possible to make it.

By using hoop-iron bond, as previously referred to in these columns, the function of the mortar in holding securely together the component parts of the wall is considerably added to. The use of this iron bond is increasing, and when some enterprising manufacturer comes forward to push it vigorously, it will doubtless be the exception where it is not used rather than the rule. Its advantages are too great, and its cost comparatively too low, to make it long in coming into general use.

ARTHUR SEYMOUR JENNINGS.

FIREPROOF AND DURABLE BRICKS AND MORTAR MADE FROM WASTE MATERIAL.

From the Journal of Commerce and Building Record, Texas.

In the first instance, it must be particularly and distinctly borne in mind that the writer does not hold himself responsible for any man's ignorance or prejudice against "home (Texas) manufacture."

Brogniart of France, Ure of England, and other scientists tell us that there are four classes of clays: first, fire clay; second, potters' plastic clay; third, effervescing clay; and fourth, ochre clay.

Effervescing clay is so named from the heavy presence of chalk, often interspersed with small pebbles or particles of rotten or decomposed lime, stone, carbonate of lime, and small shells.

These effervescing clays, which at present are cast aside as useless and worthless, for want of proper treatment in manufacture, are perhaps the most useful, if not the most valuable, for the manufacture of indestructible hydraulic and perfectly fireproof city building material. They were the clays of the Romans and other more ancient nations; of these they made their indestructible bricks and built their indestructible cities, indestructible wagon roads and pavements.

The nations of the past that lived in the channels of the ancient Nile, Mexican America, and elsewhere, whose people and races are not even known in the pages of the most ancient history, all had their bricks, their vases, and their human figures in well-burnt, hard "effervescing clay."

Granite disintegrates and crumbles into particles of mica, quartz, and feldspar; marble moulders into dust of carbonate of lime; but well-burnt, hard effervescing clay bricks endure forever, as the ancient landmarks of mankind unquestionably prove.

Effervescing clay bricks, by proper treatment in manufacture, when ground into fine powder, produce "Roman cement" of the very highest order and quality. These bricks, when set or built in their own cement, produce one solid mass of indestructible, hydraulic, and perfect fireproof rock building from foundation to roof, constantly increasing in strength, beauty, and value with age and with change of temperature, constituting the old Roman indestructible city building material; and the old Roman solid hydraulic rock wagon roads, better, harder, and more indestructible to-day than the day they were built, in the days of Julius Cæsar. It is a well-known fact, beyond all doubt and argument, that the foundations of important Roman and other ancient buildings are all built of effervescing clay bricks, set in their own cement or mortar.

The foundation of the great St. Paul's of London, built by Sir Christopher Wren, is built of these clay bricks, set or built in good Roman cement mortar. The character and tenacity of these bricks are such it is said that, by proper treatment in manufacture, they will stand the high pitch of cast iron melting and the most sudden heating and cooling without cracking or falling to pieces.

Here, on the great Mounts Barker and Bonnel, adjacent to the city of Austin, these valuable effervescing clays exist in hills from three to four hundred feet high and fathoms deep; close to railway transportation, for shipment to all parts of Texas and the South; never-failing water, the Colorado River, with millions upon millions of the very best wood, cedar, and hard oaks for fuel; in one of the most beautiful and healthy climates in the world, barring none.

When our beautiful "Dam" is finished, we shall require millions upon millions of these beautiful effervescing clay bricks, and many tons of Roman and Portland cements, for the city will extend, and in the expansion the best and safest material will unquestionably be used and the effervescing clay will be selected; nor is this all, as its merits become known, its popularity will extend.

I will take pleasure in entering into a more full and minute explanation relative to these clays, their uses and proper treatment.

J. Dimelow.

Laboratory of the State of Texas and the South,
Mount Barker, near Austin, Texas, June 24, 1892.

MORTAR.

The cohesive and adhesive strength of mortar in waterbound brickwork, says the *Building News* in an article on the subject, is due not to its peculiar hardness, for that is a quality which it cannot be said to largely possess, but is due rather to its *elasticity*; for it is frequently found when cutting away or removing portions of this kind of work that a stout chisel may, without experiencing much resistive force, be driven into the mortar joints without any apparent effect beyond that of displacing so much of the mortar as previously occupied the space taken up by the chisel; the largest portion of the displaced mortar being driven into a closer molecular proximity than previously existed. The ancient Romans, who seem to have done all things well, are accredited with the practice, in the preparation of their mortars, of forming pits and burying the newly made mortars for a considerable time before using them; a statement sometimes adduced (and not unreasonably so) to account for the strength and durability of their work. In criticising the remains of old work, it is well to remember that in that, as in all things, we have the survival of the fittest; that the bad work of the ancients (if they did any) is gone, like Prospero's "insubstantial pageant faded," leaving "not a rack behind," and we are left only with the good from which to draw our inference of the whole.

Such a process of mortar-making, however desirable, cannot in these go-ahead days of heavy city ground rents and suburban building of mushroom growth be now indulged in. But the really practical man is often astonished to find in specifications emanating from high places the following words: "No more mortar to be made up at one time than is necessary for the day's consumption." This is a necessary provision when building in the winter season, and it is necessary to provide at other seasons that the mortar shall not lie about in thin isolated beds or layers until all moisture is extracted from it. But it is desirable under all other circumstances that it be allowed to lie sufficiently long to admit of the unequally burnt parts of lime taking in sufficient moisture to make them soluble, as lime that is not well burnt imbibes water very tardily.

When this is not done these parts will slake in the brickwork, forcing out portions of joints in their immediate vicinity, and raising considerable portions of the overlying brickwork off its beds. Such under-burnt parts of lime are, when slaked, distinguishable by a dark bluish-gray color, and if exposed sufficiently long to the air will resolve themselves into a fine powder.

The lines in general use in and about London are the Dorking, the Merstham and Halling, and are known as gray or stone lime. These limes are used for the first and second coats of the plasterer — viz., the rendering and floating coats — as they acquire in setting a hardness which the chalk or pure limes never attain, the chalk lime being suitable only for the third or finishing coat, known technically as "setting," and which acquires its hardness by the process of trowelling to which it is subjected by the plasterer when mixed with about one third of fine washed sand, or are otherwise gauged with plaster of Paris.

Well-burnt graystone limes imbibe water greedily, slake freely and quickly if supplied with sufficient water, while the eminently hydraulic limes imbibe water less freely, and slake very tardily, and for this reason blue lias lime, when in the lump, should be covered over with sand for two or three days, and copiously supplied with water, before putting it in the mortar-pan, the wet sand retaining some of the water applied and to some extent preventing the escape of the heat generated in the incipient stage of the slaking process, which two factors combined are generally considered to accelerate the slaking.

The advantage claimed for mortar that has been made up sufficiently long to allow it to properly cool is that the outer skin of the mortar heap becomes sufficiently hard by the process of surface evaporation and the attraction of atmospheric carbon to imprison within the bulk sufficient moisture to slake the badly burnt portions of lime, in the shape of "core," that may be in the mortar, to set up in its incipient stage the chemical action which we are told takes place between *silex* or sand-grains and dissolved lime, coating the individual grains or *nuclei*, and filling up the microscopic spaces which must exist between all angular grains, however small they may be.

By a proper process of retempering the mortar, the particles are driven closer together, the excess water is eliminated, and the mortar acquires a characteristic known to workmen practised in the use of mortar by the name of *toughness*, in which state it can be used with infinitely less liability to shrinkage than a newly made mortar.

Walls built with tempered mortar and bricks sufficiently wetted — that is, wetted to a degree short of absolute saturation, a degree which can be better determined by the practical workman than prescribed here — produces the best results. By all means avoid the use of super-saturated bricks.

It not infrequently happens that a bad mortar is produced from good material, and the one chief thing productive of this is the modern mortar-pan, coupled with the impractical idea of many of our so-called builders of to-day (largely — very largely — recruited from the ranks of builders' clerks, with a knowledge of building commensurate to the making out a list of items under the head £ s. d., and circumscribed by the four edges of a sheet of foolscap) that any unskilled workman (*i. e.*, unskilled in that particular branch) can turn out a bed of bricklayers' mortar. This work, more often than not, is assigned to the engine-driver, who does the double duty of engine-driver and mortar-pan attendant. If he be a competent driver, the chances are that he knows little, and cares less, about mortar; and years of practical experience in the supervision of work have taught the writer that the mortar is turned out of the pan either imperfectly incorporated, or, what is more frequently the case, is overground to such a degree as to be little better than mere dust when dry, the grit and body of the sand being ground out of it.

The objection to loam in sand is that it deteriorates the setting and indurating properties of the lime, coating the sand grains and forming a separating medium between them and the lime, to the injury of the tensile and cohesive strength of the resulting mortar. Mortars made of unclean or loamy sand are very liable to shrinkage and cracks. The use of water impregnated with loam or clay should be avoided, both in slaking the lime and in retempering the mortar.

BRICKS AND BRICKWORK.

A Lecture delivered at Carpenter's Hall, London, by Prof. T. Roger Smith, F. R. I. B. A.

(*Concluded.*)

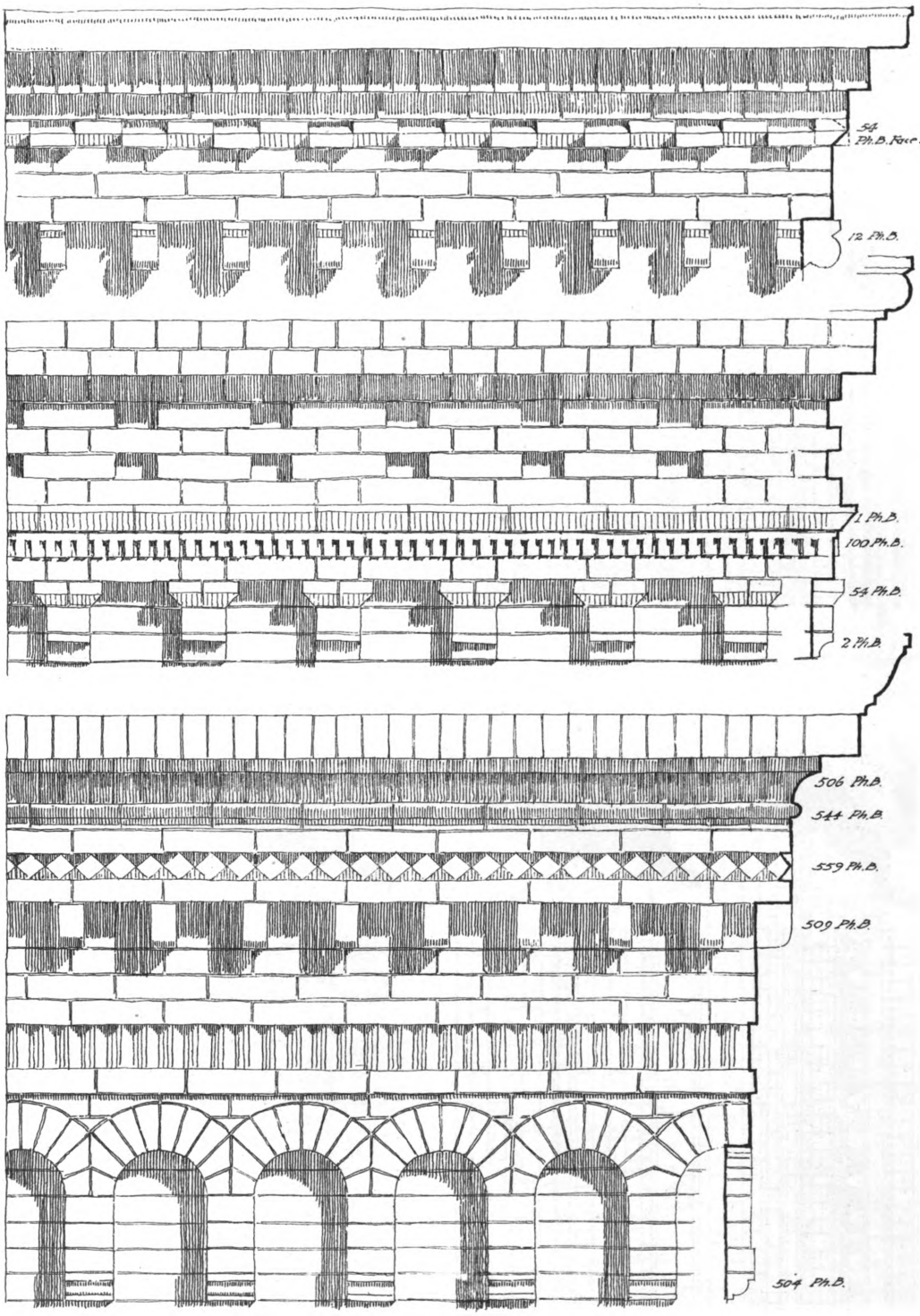
Against each of these good qualities, however, we may set a corresponding defect. If brickwork is easily thrown into any shape, it is also thrown easily out of shape. It has little coherence or stability, less than masonry, and very considerable less than timber. If any unequal settlement in the foundation of a brick building occurs, those long zigzag cracks, with which we in London are only too familiar, set themselves up at once, and if any undue load or any variation in load exists, the brickwork begins to bulge. Any serious shock may cause a building of ordinary brickwork to collapse altogether, and from time to time a formidable accident occurs owing to this cause. The fact is, the bricks are each so small compared to the mass of the work, and the tenacity or hold upon them of even fairly good lime mortar is so comparatively slight, that there is really but little grip of one put

SUPPLEMENT TO THE BRICKBUILDER.

JULY, 1892.

CERTOSA, AT PAVIA.

Fifth of a Series of Photographs of Foreign Brickwork.



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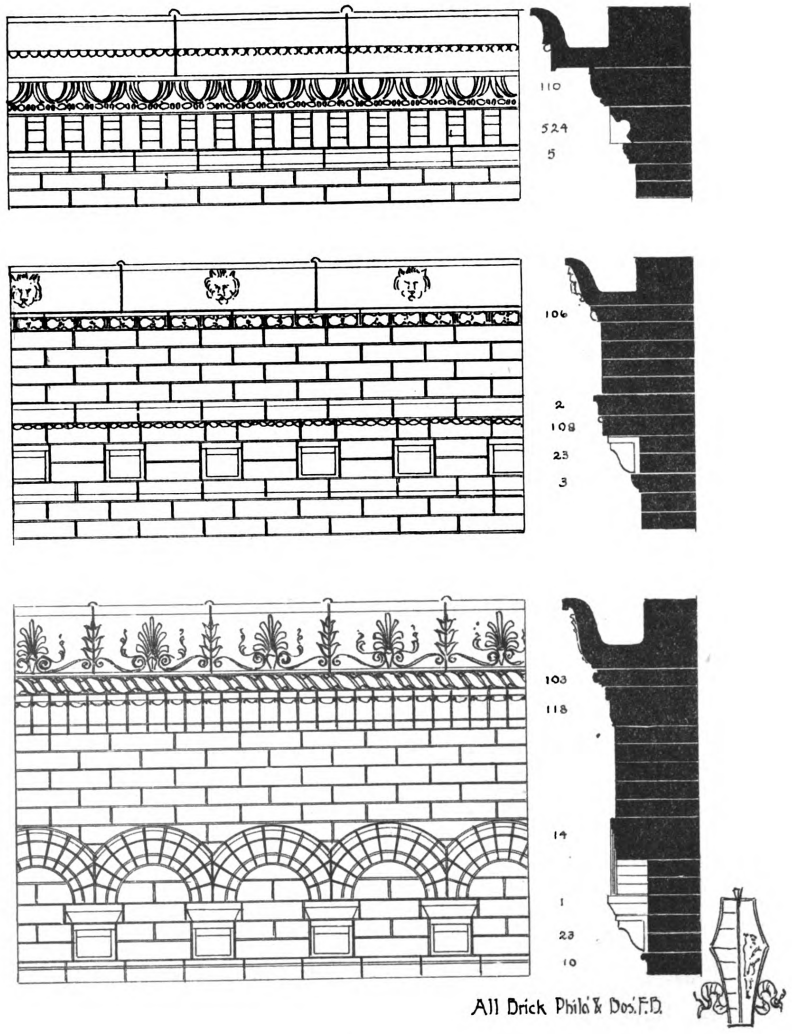

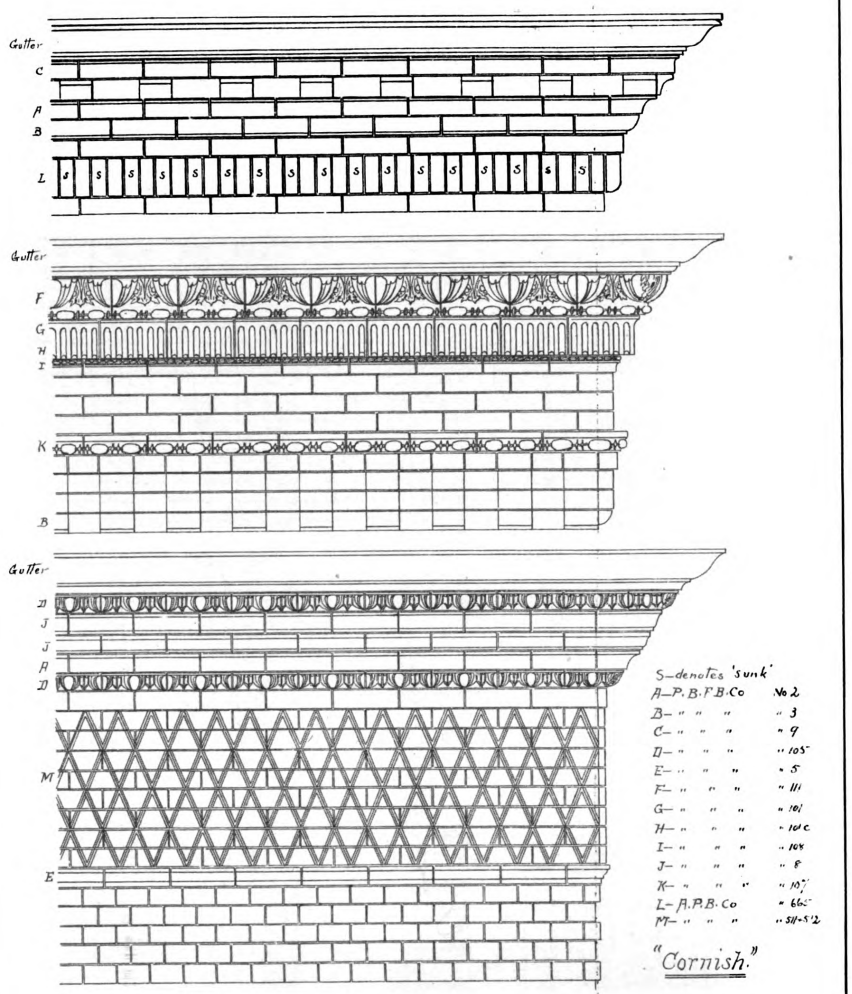

SECOND PRIZE. JAS. C. GREEN, ST. LOUIS.

THIRD PRIZE. W. W. DEVEAUX, N. Y. CITY.

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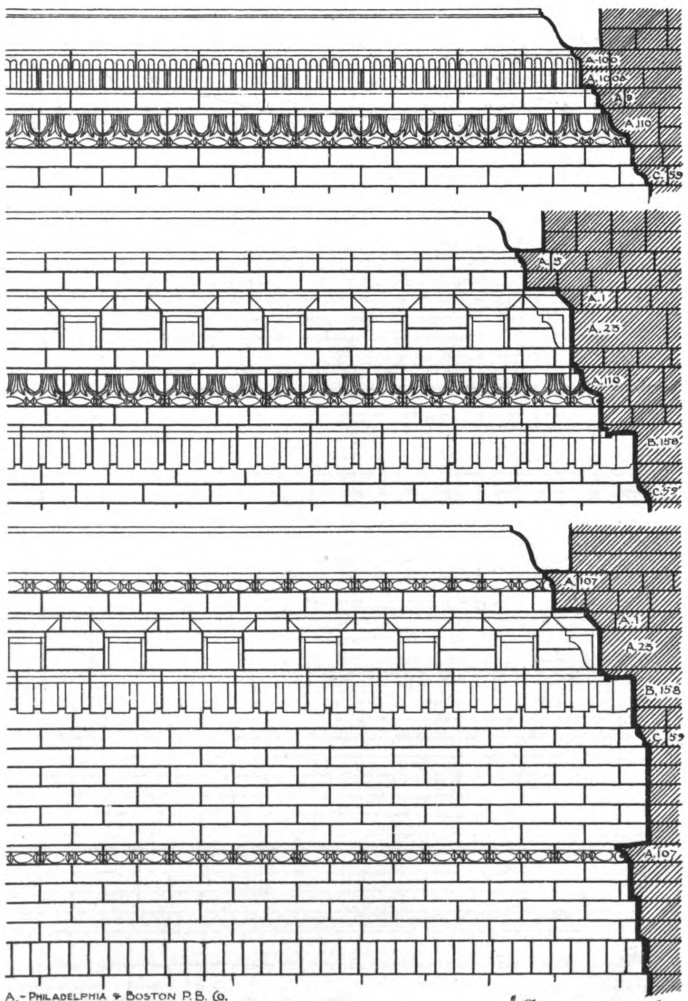

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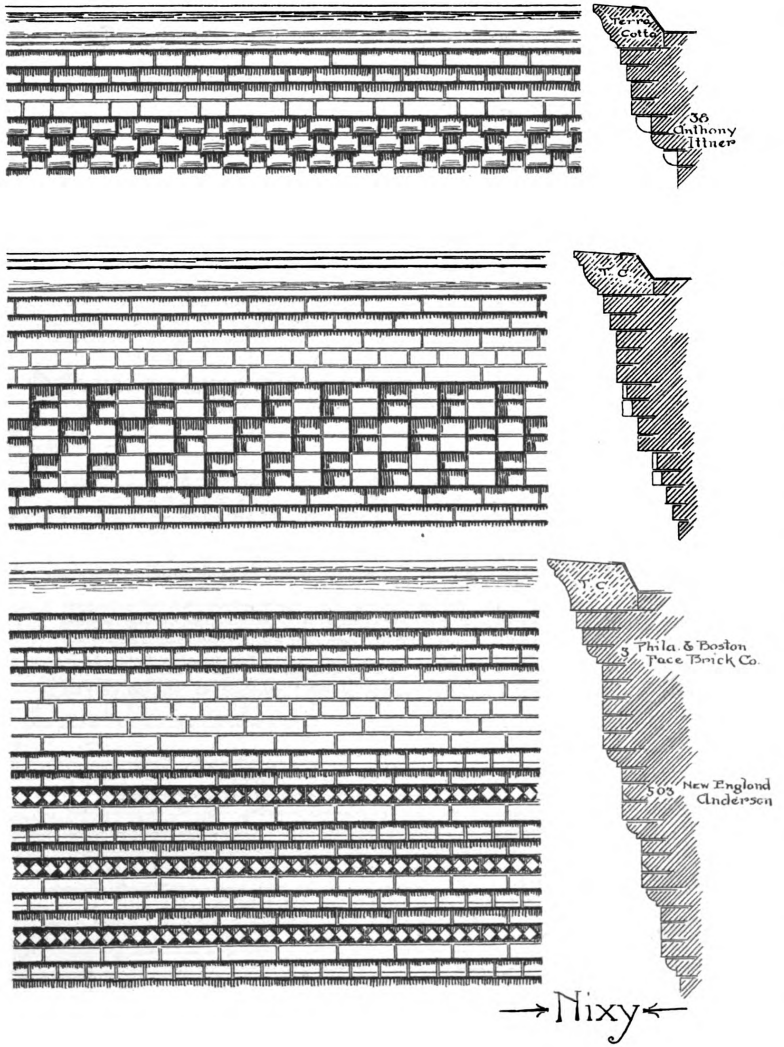
C.- ANTHONY ITTNER.

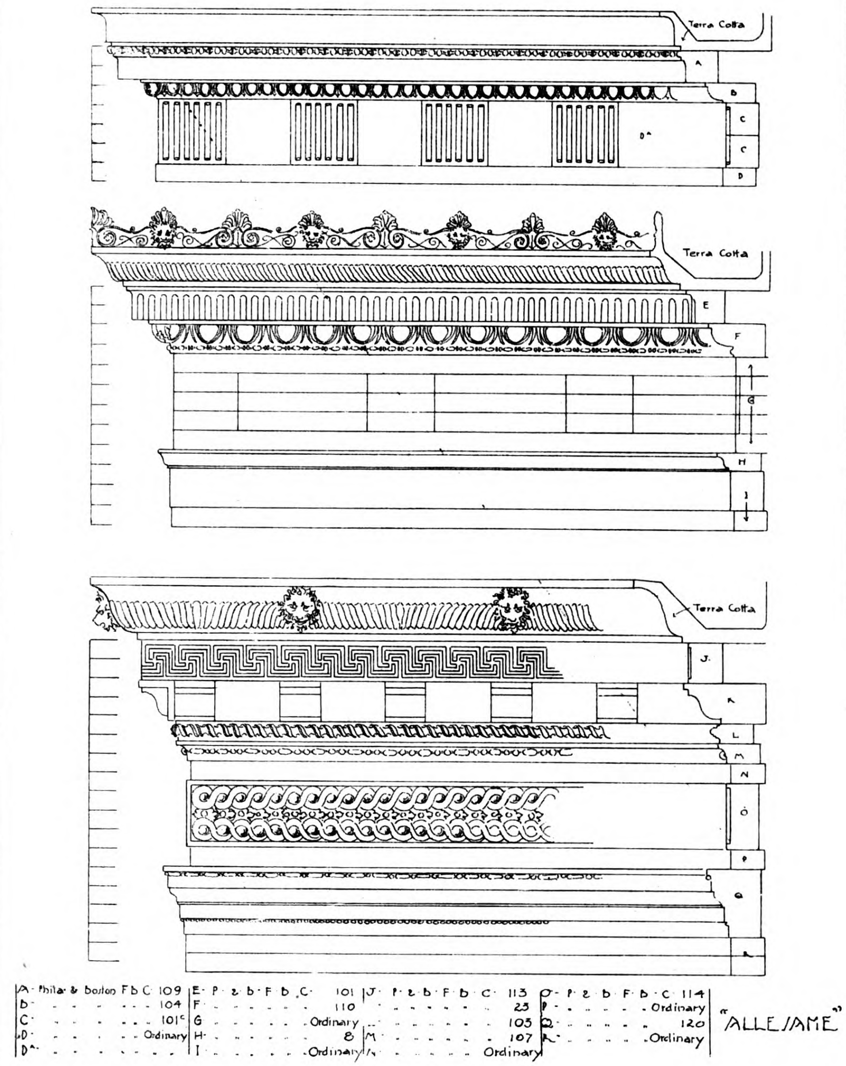
"CLASSICUS"

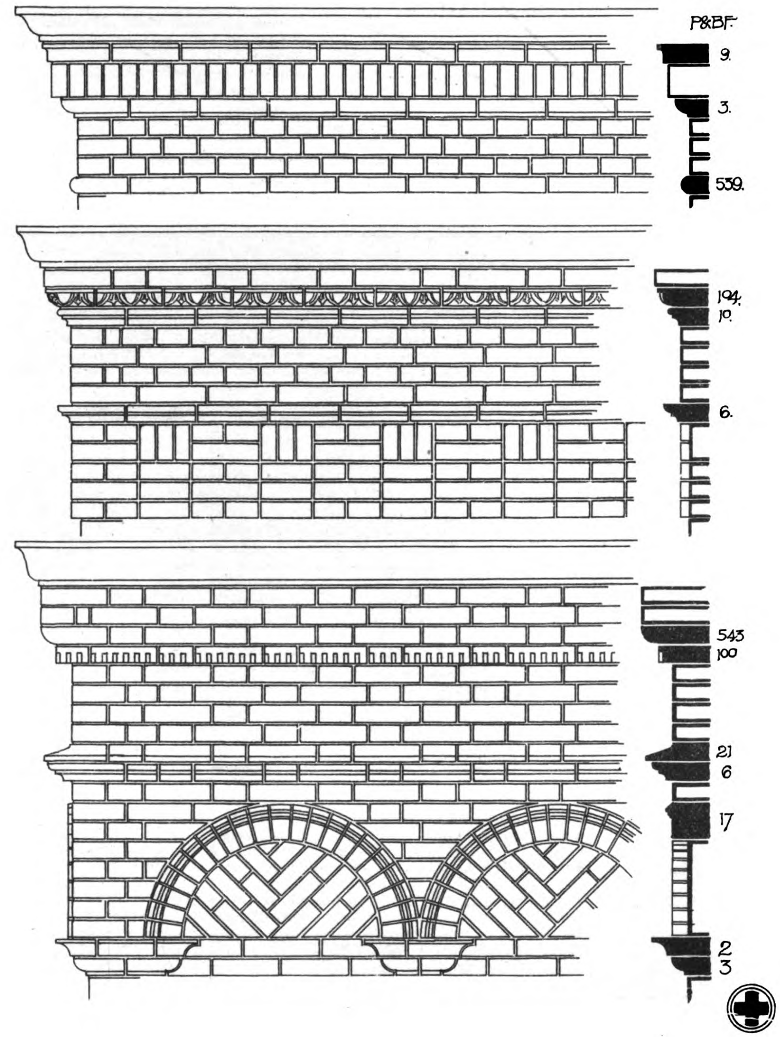


→Nixy←

WILL S. ALDRICH, SOMERVILLE, MASS.

R. F. BOCORSELSKI, HARTFORD, CONN.



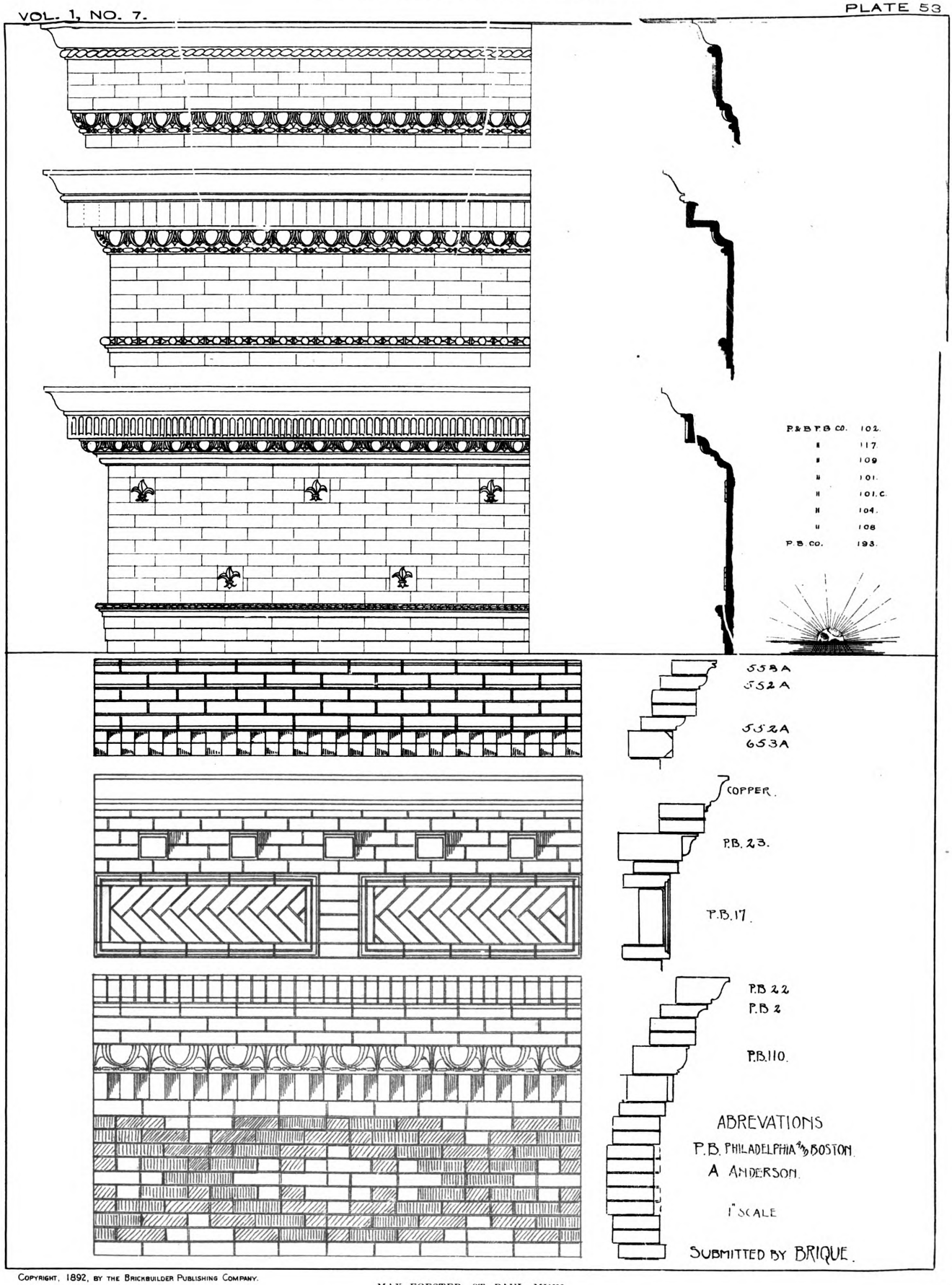


HARRY EDWARD PRINDLE, N. Y. CITY.

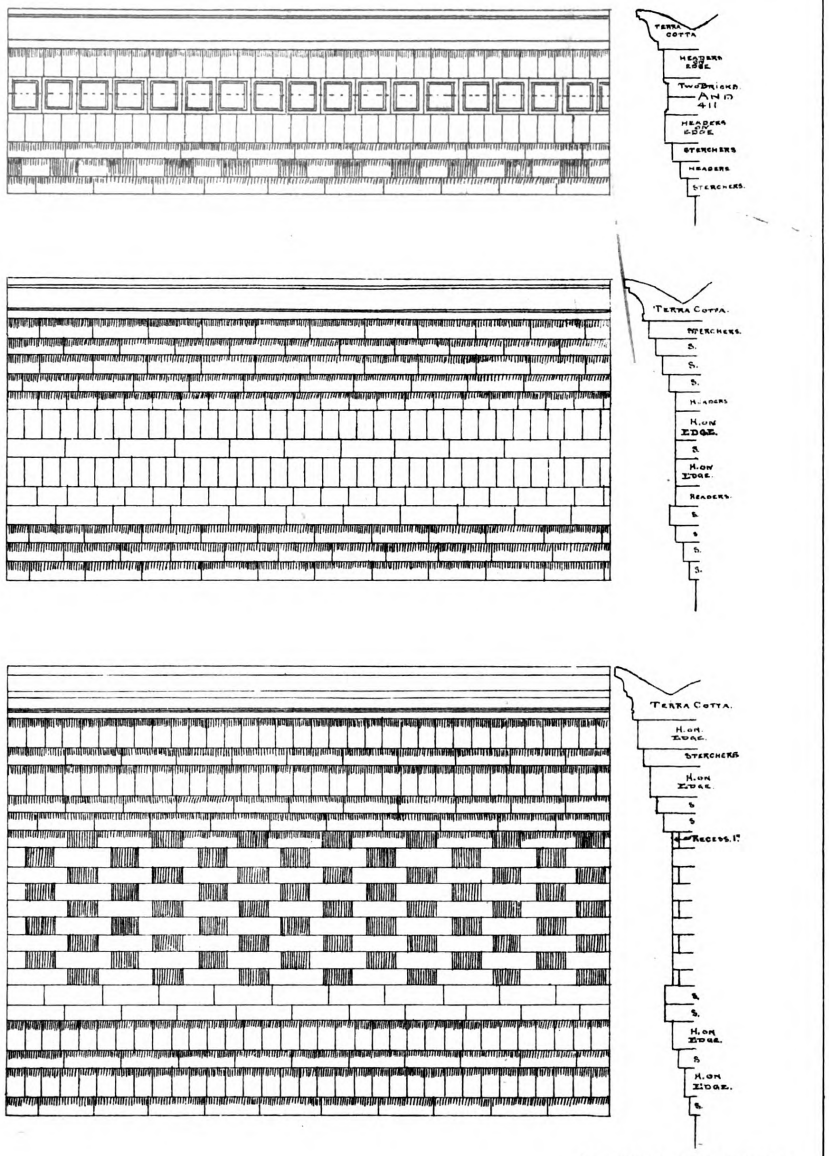
H. G. FLETCHER, SOMERVILLE, MASS.

BRICKBUILDER COMPETITION, No. 3.

FIFTH PRIZES.

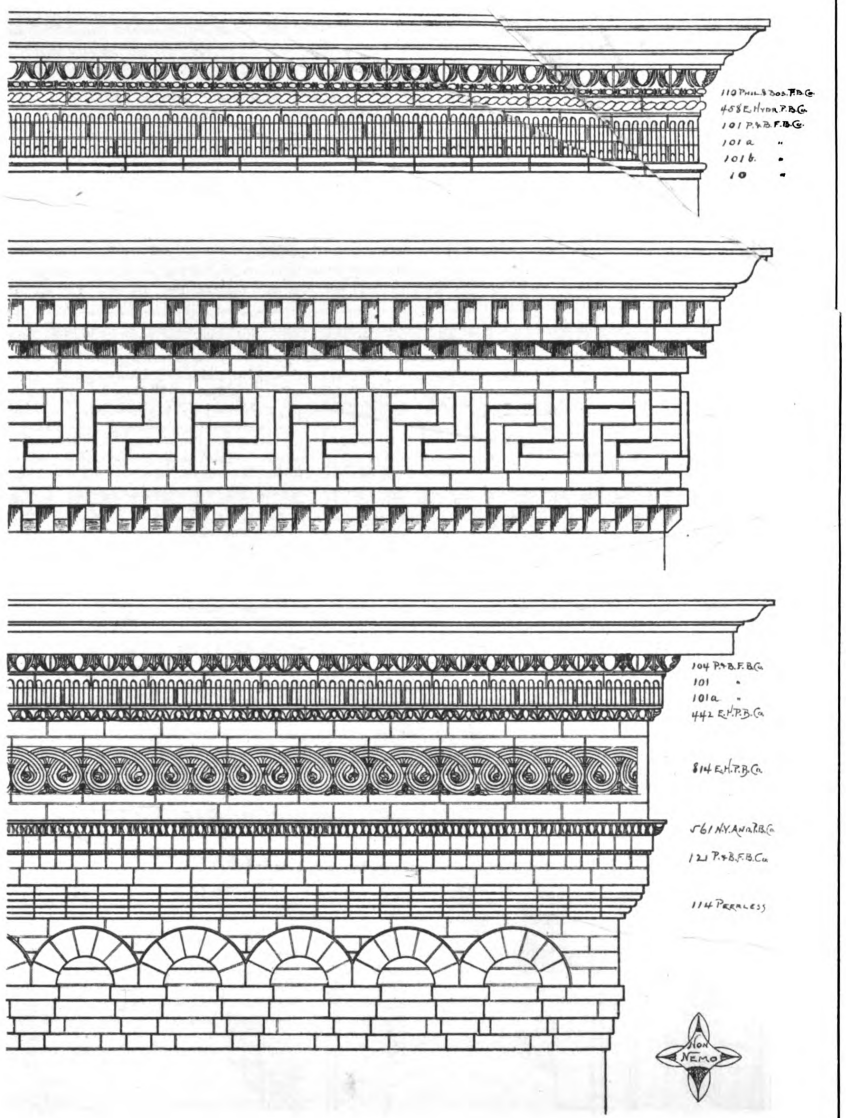


MAX FOESTER, ST. PAUL, MINN.
G. F. CRUMP, ALBANY, N. Y.
BRICKBUILDER COMPETITION, No. 3.



THE AKON VITRIFIED PRESSED CO. BRICKS ONLY TO BE USED.

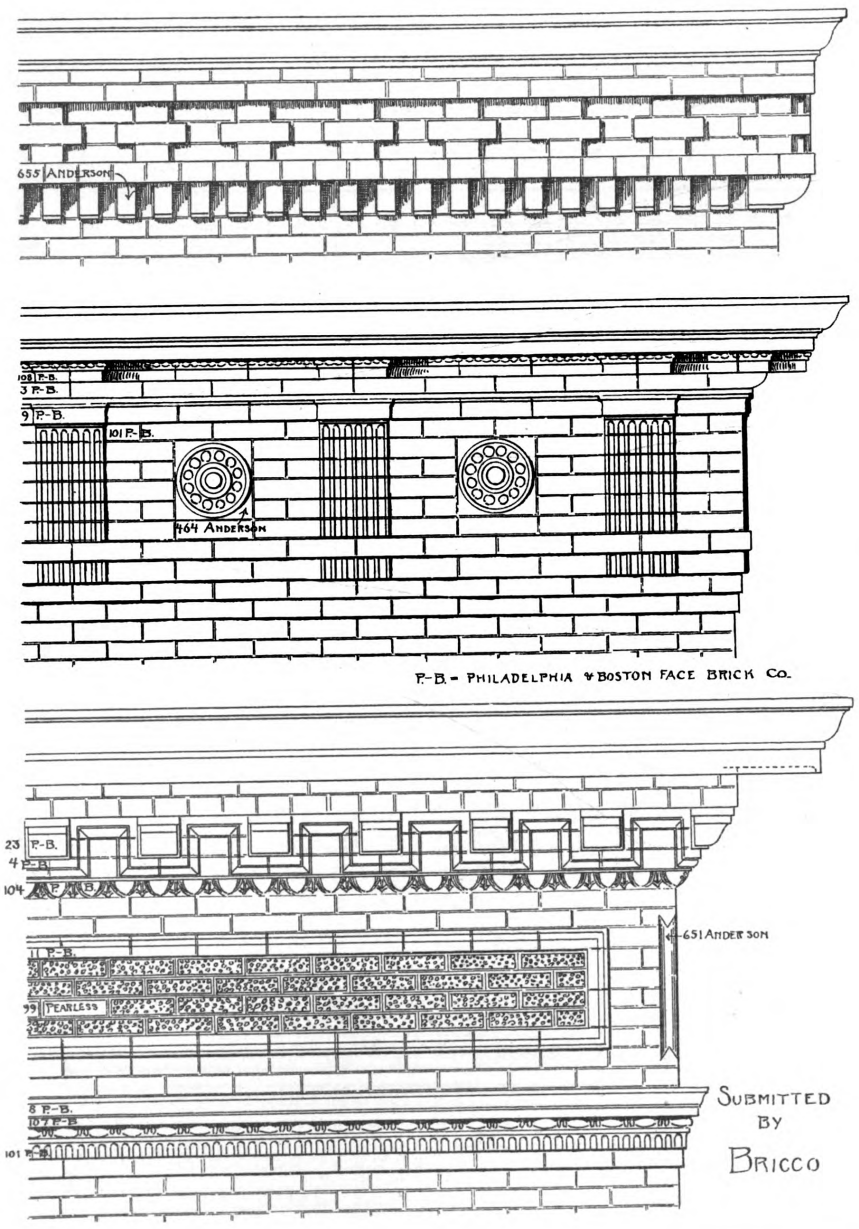
SUBMITTED BY
"DON."

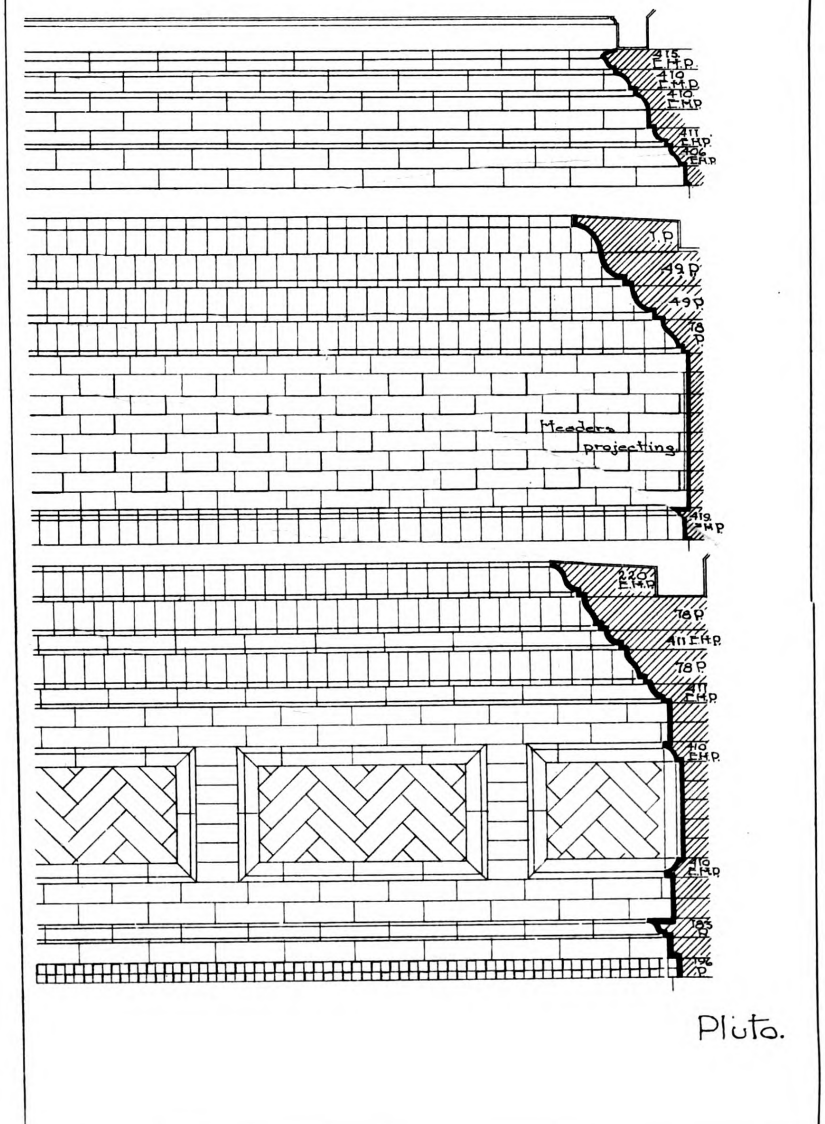


W. P. CRABTREE, NEW BRITAIN, CONN.

CHARLES H. CULLEN, HARTFORD, CONN.

BRICKBUILDER COMPETITION, No. 3.



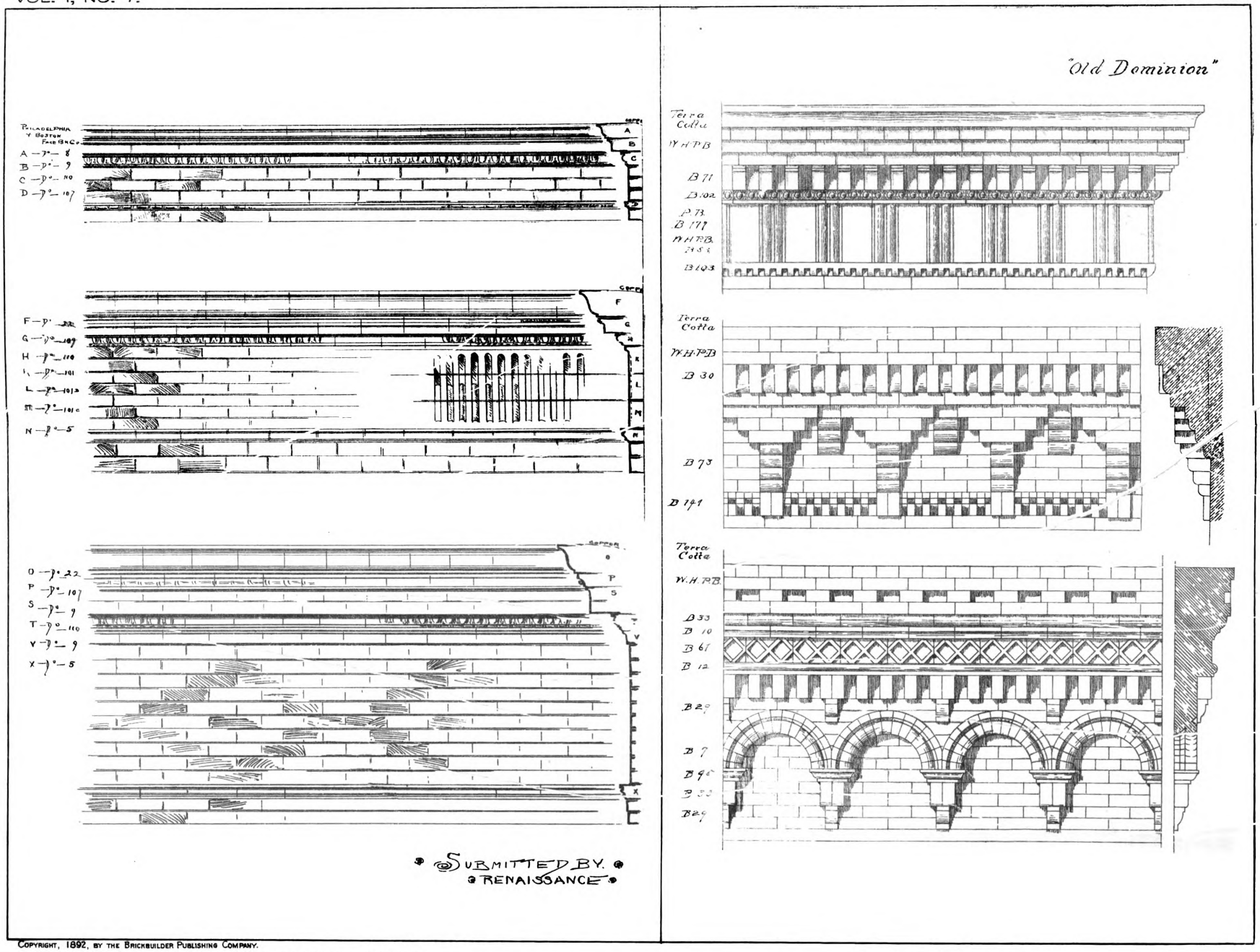


FRANK W. WHITON, HARTFORD, CONN.

BRICKBUILDER COMPETITION, No. 3.

HONORABLE MENTION.

LOUIS SONNTAG, PHILADELPHIA.



WALTER H. VOLCKENING, BROOKLYN.

HONORABLE MENTION.

BRICKBUILDER COMPETITION, No. 3.

H. W. OLCOTT, RICHMOND, VA.

OUT OF THE COMPETITION.

upon another. Persons who have to design and construct brick buildings should never forget that they have to be handled with caution and are really very ticklish and unstable.

One or two of the methods of overcoming this to some extent may be mentioned.

The first is the introduction of what is called bond. At the end of the last century it was usual to build in, at every few feet in height, bond timbers, which were embedded in the heart of the walls. If these had always remained indestructible, they would no doubt have served their purpose to some extent. Unfortunately, timber both rots and burns, and this bond timber has brought down many a wall owing to its being destroyed by fire, and has in other cases decayed away, and caused cracks, settlements, and failures.

The more modern method of introducing a strong horizontal tie is to build into the wall a group of bands of thin iron, such as some sorts of barrels are hooped with, hence called hoop-iron. The courses of bricks where this occurs must be laid in cement, because iron in contact with cement does not perish as it does in contact with mortar. If in every story of a building four or five courses are thus laid and fortified, a great deal of strength is given to the structure.

Another method which has rather fallen into disuse is grouting. This is pouring liquid mortar, about the consistency of gruel, upon the work at about every fourth course. The result is to fill up all interstices and cavities, and to delay the drying of the mortar, and brickwork so treated sets extremely hard. I have seen a wall that has been so treated cut into, and it was quite as easy to cut the bricks (sound ones though they were) as the mortar joints.

Grouting is objected to because it interferes with the good look of the work, as it is very difficult to prevent streaks of it from running down the face, and it is apt to delay the work, but it is a valuable means of obtaining strong brickwork.

Another and more popular method is to build the work in cement, now usually Portland cement. This, of course, makes very strong, sound work, and does not involve any delay or dirt like grouting, or the introduction of any fresh material like hoop-iron; but it, of course, adds to the expense of the work considerably, as cement is much more costly than lime. I ought to add that the advocates of Scott's selenitic mortar claim that it not only sets quickly and hard, but that it is extremely tenacious and consequently makes a much more robust wall than ordinary mortar. I dare say this is true, but I have not happened to see such a wall cut into, and this is the best test of solidity.

The second deficiency in brickwork which I am bound to notice is that, though it is very fireproof, it is far from being waterproof. In an exposed situation, rain will drive completely through a tolerably stout brick wall. If water be allowed to drop or fall against it, the wall will become saturated like a sponge. If the foot of a wall becomes wet, or if the earth resting against the lower parts of it be moist, water will, if not checked, rise to a great height in it, and if the upper part of the wall be wet, the water will sink downwards. With most sorts of brick the outer face absorbs moisture whenever the weather is moist, and in time the action of the rain, and the subsequent action of frost upon the moisture so taken up, destroy the mortar in the joints, which are to be seen perfectly open as if they had been raked out. In old brickwork, and in some cases (happily not in many), the action of weather destroys the bricks themselves, the face decaying away and the brick becoming soft.

Against this serious defect in our staple building material a series of precautions has been devised. Damp, rising from the foot of the wall or from earth lying round its base, is combated by a damp-course, — a bed of some impervious material going through the wall.

Damp earth may be kept off by surrounding the walls with an open area or a closed one, usually termed a dry area. Damp against the face of the walls may be partly combated by a careful selection of a non-absorbent brick with a hard face, and by struck joints; but it is most effectually kept at bay by the expedient of building the wall hollow, that is to say, making the external wall of the house to consist of two perfectly distinct walls, standing about two inches apart, and held together by ties of earthenware or iron. The result is that the moisture blowing through the outer skin does not pass the cavity, but trickles down on the inner face of the outer wall, while the inner wall remains dry.

The ties are constructed of shapes to prevent their conducting water themselves from without to the inner wall.

In addition to this, a series of slates forming an intermediate protection is sometimes introduced, and forms an additional and most valuable screen against weather. Sometimes the two skins of the wall are closer together — say three fourths inch — and the space is filled with a bituminous material. A substance of a bituminous nature, called hygeran rock, has been of late years introduced, and is being extensively used for this purpose; it is melted and poured into the open space hot, and quickly hardens. The use of such a material is open to the objection that no air can pass through it. The rooms of our houses are receiving air constantly through the walls, and much of the constant current up our chimneys is supplied, to our great advantage, in this very imperceptible manner. The house breathes, so to speak, through the pores of its brickwork. When this is rendered impossible, it seems clear that fiercer draughts will enter through the chinks and crevices, and that there will be a greater demand upon flues not in use, occasioning down draught in the chimneys.

Another mode of keeping out weather is to cement the face of the brickwork, but this hides up the work and so tends to promote bad work, besides being often very unsightly.

Among other peculiarities of brickwork are the facilities for introducing different colors and different textures of surface which it presents, the ease with which openings and arches can be formed in it, the possibility of executing ornament and even carving, and the ease with which brickwork will combine with other building materials. It cannot be well made use of for columns, though it may readily enough be turned into piers or pilasters. It cannot, generally speaking, with advantage be made use of for any large domes, though the inner dome of St. Paul's and the intermediate cone are of brick and stand well; but it is an excellent material for vaulting arcades, and all purposes involving the turning of arches.

Brickwork must be said to be durable, but it requires care. If not of the best, brickwork within the reach of the constant vibration caused by the traffic on a railroad seems to be in danger of being shaken to pieces, judging from one or two instances that have come under my own observation. The mortar, and even in some cases the bricks themselves, will rapidly deteriorate if moisture be allowed to get into the heart of a brick wall, and in exposed situations this is very apt to happen.

Care should always be taken to keep the pointing of external brickwork in good order, and to maintain all copings and other projections intended to bar the access of water coming down from above, and to stop the overflowing of gutters and slack pipes, which soon soaks the wall through and through.

Of course, if there is a failure of foundations, brickwork, as was pointed out earlier, becomes affected at once; but if these be good, and the materials used be sound ones, and if the other precautions just recommended be taken, it will last strong and sturdy for an immense length of time. In some cases, as, for example, in the Roman ruins, it has stood for fifteen hundred years under every possible exposure and neglect, and still shows something of a sturdy existence after all, though sadly mutilated.

If we now return to the question, what can be well done in brickwork, no better answer can be given than to point to what has been and is being done, especially in London and within our own reach and observation. Great engineering works, such as railway viaducts, the lining of railway tunnels, the piers and even the arches of bridges, sewage works, dock and wharf walls, furnace chimneys, and other works of this sort are chiefly done in brickwork, and notwithstanding that iron is far more used by the engineer for some purposes and concrete for others now than formerly, still there is a great field for brickwork.

The late Mr. Brunel, who was fond of pushing size to extremes, tried how wide a span he could arch over with brickwork, and I believe the bridge which carries the G. W. R. over the Thames at Maidenhead has the widest arch he or any other engineer has successfully erected in brick. This arch has, it is stated, a span of 128 feet. It is segmental, the radius being 169 feet, and the rise from springing to crown 24 feet, and the depth of the arch 5 feet 3 inches.

Nowadays, of course, no one would dream of anything but an iron girder bridge in such a position. Mr. Brunel's father, when he constructed the Thames Tunnel, lined it with brickwork foot by foot as he went on, and that lining sustained the heavy weight of the bed of the river and the river itself.

If you leave London by either of the southern lines, all of which are at a high level, you go for miles on viaducts consisting of brick arches carried on brick walls. If you leave by the northern lines, you plunge into tunnel after tunnel lined with brickwork, and kept secure by such lining. Mile after mile of London streets and those in the suburbs present to the eye little but brick buildings. Dwelling-houses, shops, warehouses, succeed one another, all in brickwork, and even when the eye seems to catch a change it is more apparent than real. The white mansions of Tyburnia, Belgravia, South Kensington, and the neat villas of the suburbs are only brickwork, with a thin coat of stucco, which serves the purpose of concealing the real structure — often only too much in need of concealment — with a material supposed to be a little more sightly, and certainly capable of keeping the weather out rather more effectually than common brickwork would. More than this, such fine structures, apparently built entirely of stone, as are being put up for commercial purposes in the streets of the city, and for public purposes throughout London, are all of them nothing more than brick fabrics with a facing of masonry. Examine one of them in progress and you will find the foundations and vaults of brickwork, and not only the interior walls, but the main part of the front wall, executed in brickwork, and the stone only skin deep.

There are, however, two or three ways of making use of brickwork without covering it up, and of gaining good architectural effects thereby, and to these I beg now to direct your attention.

The architect who desires to make an effective brick building, which shall honestly proclaim to all the world that it is of brick, may do this and, if he will, may do it successfully by employing brickwork and no other material, but making the best use of the opportunities which it affords, or he may erect his building of brickwork and stone combined, or of brickwork and terra-cotta.

Mr. Robson, till lately the architect to the School Board of London, has the merit of having put down in every part of the metropolis a series of well-contrived and well-designed buildings, the exterior of which, almost without exception, consists of brickwork only. If you examine one of his schoolhouses you will see that the walls are of ordinary stock brickwork, but usually brightened up by a little red brick at each angle, and surmounted by well-contrasted gables, and with lofty, well-designed chimneys rising from the tiled roof. The window openings and doorways are marked by brickwork, usually also red and sometimes moulded, and though I personally must differ from the taste which selected some of the forms employed (they are those in use in this country in the seventeenth and the last centuries), I cordially recognize that with very simple and inexpensive means exceedingly good, appropriate, and effective buildings have been designed.

Among examples of architecture wholly or almost wholly executed in red brick, I cannot pass over a building built many years ago, little known on account of its obscure situation, but a gem in its way. I allude to the schools designed by Mr. Wilde, and built in Castle Street, Endell Street. Of buildings where a small amount of stone is introduced into brickwork we have a good many fine specimens in London. One of the best — probably the best — is the library in Lincoln's Inn Fields. This is a large and picturesque pile, built under Mr. Hardwick as architect, in red brick, with patterns in the blank parts of the walls done in black brick. It has splendid moulded brick chimneys, and the mullions of the windows, the copings, the entrances, and some other architectural features done in stone. The building is a good reproduction of the style of building in Tudor times, when, as has been already mentioned, brickwork was taken into favor.

Another building of the same class, but not so good, is the older part of the Consumption Hospital at Brompton. Brickwork, with a little stone, has been very successfuly employed as the material for churches, and in many such cases the interior is unplastered brickwork. Such churches often attain, when designed by skilful hands, great dignity and breadth of effect. St. Alban's, Holborn; the great church designed by Mr. Butterfield in Margaret Street; Mr. Street's church near Vincent Square, Westminster; and several churches of Mr. Brooks', such as he was kind enough to enable me to illustrate to-night, may be mentioned as examples of the sort.

Mr. Waterhouse has built an elaborate Congregational church at Hampstead which shows the use with which such effects of color may be obtained in interiors, and has kindly lent some drawings. Mr. Pearson's church at Kilburn may also be referred to as a fine example of brick vaulting.

Brick and terra-cotta seem to have a natural affinity for one another. Terra-cotta is no more than a refined brick, made of the same sort of material, only in every respect more carefully, and kiln baked. Its similarity to brick is such that there is no sense of incongruity if moulded or carved brickwork and terra-cotta are both employed in the same building, and this can hardly be said to be the case if the attempt is made to combine ornamental brickwork and stone ornaments.

At South Kensington a whole group of examples of brickwork with terra-cotta meet us. The Natural History Museum, the finest of them all, is hardly fit for our present purpose, as it is as completely encased in terra-cotta as the fronts of the buildings in this avenue are in stone. But here are the Albert Hall, a fine specimen of mass and effect, the City and Guilds Institute, the College of Music, and some private houses and blocks of flats, all in red brick with terra-cotta, and all showing the happy manner in which the two materials can be blended. In most of them there is a contrast of color; but Mr. Waterhouse, in the Technical Institute, has employed red terra-cotta with red bricks, as he has also done in his fine St. Paul's School at Hammersmith, and Mr. Norman Shaw has, in his fine pile of buildings in St. James's Street. This combination — namely, brick and terra-cotta — I look upon as the best for withstanding the London climate and for making full use of the capabilities of brickwork that can be employed, and I have no doubt that in the future it will be frequently resorted to. Some of these examples also show the introduction of cast ornaments, and others the employment of carving as means of enriching the surface of brick walls with excellent effect.

Here we must leave the subject, but in closing I cannot forbear pointing to the art of the bricklayer as a fine example of what may be accomplished by steady perseverance. Every brick in the miles of viaducts or tunnels, houses or public buildings, to which we have made allusion, was laid separately, and it is only steady perseverance, brick after brick, on the part of the bricklayer, which could have raised these great masses of work. Let me add that no one brick out of the many laid is of no importance. Some time ago a great fire occurred in a public asylum, and about £2,000 of damage was done, and the lives of many of the inmates endangered. When the origin of the fire came to be traced out, it was found that it was due to one brick being left out in a flue. A penny would be a high estimate of the cost of that brick and of the expense of laying it, yet, through the neglect of that pennyworth, £2,000 damage was done, and risk of human life was run. I think there is a moral in this story which each of us can make out if he will.— *The Building News.*

ESTIMATES ON DESIGNS PUBLISHED.

Architects, contractors, and builders, wishing to ascertain the cost of material for any of the competition designs published, when the cost is not stated, have only to write to the company or companies whose bricks are specified, stating the year and number of the plate on which the design is shown, and any particulars as to color of bricks, size of job, method of shipment, and the manufacturers will take pleasure in promptly quoting prices. The addresses of the different manufacturers may be found in our advertising columns.

CORRESPONDENCE.

SAVANNAH, ILL.

THE BRICKBUILDER, Boston, — Have just received copy of BRICKBUILDER with article "Sell more Bricks" marked. A good way to have more bricks sold is to build more brick houses, and a good way to have more people build more brick houses is to publish "taking" designs for brick houses. Now, I want to build several cheap houses for rent, and would as soon build of brick as any way, if I could get designs to suit. Can you help me out, or do you know who can? I enclose stamped envelope.

Respectfully, L. G. BURROWS.

We would advise our correspondent to secure the services of a competent architect unless he wishes to build the cheapest houses that will rent. If he must limit the cost to $800 or $1,200, he had best secure the services of a contractor or builder on whom he can thoroughly depend, and build a house of simplest design, in the best

manner his funds will allow. No ornamental work, adding to the cost of the building, should be applied. After all, we believe the commission paid an architect for making quarter-scale plans, elevations, and specification would be well expended. A plain brick wall, of commonest bricks, can, with intelligent treatment, be made very attractive. A house so built, with the arrangement of wall space and windows well considered, costs no more to put up than a house designed without any regard for effect obtainable by this means. The cost comes in, in securing the services of a man who knows how to do it, and this extra cost is very slight. A rough brick wall may look bare when first built, but let our correspondent plant around his new houses a few roots of the ivy that shingles with green so many Boston brick fronts (Ampelopsis Veitcheii is the botanical name), and in two years there would be nothing in Savannah more attractive.

We hope our competition for a $2,000 brick house, announced in this number, will bring in enough designs to provide suggestions for many who, like our correspondent, wish to build small houses of brick instead of wood.

BOOKS AND PAPERS.

We are in receipt of a copy of the second edition of *Hendricks's Architects' and Builders' Guide and Contractors' Directory of America*, for 1892–93, published by Samuel E. Hendricks & Co., 44 and 46 Broadway, New York.

We take pleasure in noticing this publication as it so far surpasses anything of the kind we have ever seen in arrangement and completeness. Usually these "Directories" are local affairs, originated with the sole purpose of affording opportunity to solicit advertisements, and having no real value to any one except the publishers. They usually have a nominal price, but the few copies printed are distributed free, going largely to the advertisers as proof that their advertisements have been printed. These advertisements are hardly worth the paper they are printed on.

Messrs. Hendricks & Co. have approached this work with the broader, more far-sighted view of giving their book a value, first as a directory, and second as an advertising medium, evidently realizing that the latter is dependent upon the former. They have given lists, which are almost marvellous in their completeness and correctness, of all trades and industries relating in any way to the building interests of the country. These lists are admirably arranged, their typography is the best, and the number of special paid-for headings, which in the many "so-called" directories occupy a large proportion of space, is surprisingly small. There are comparatively few advertisements scattered through the directory part, and these never interfere with the lists by breaking into them. They are, for the most part, printed on special leaves inserted at the right place. The well-arranged index of headings is also a noticeable feature.

The cost of the book, $5.00, insures an *effective* circulation, for no one would buy it but for its use. It is really indispensable to every firm supplying building materials of any sort, and architects would find it advantageous to have a copy for reference when addresses of supply firms are wanted.

THE BRICKBUILDER COMPETITIONS.

RULES: All drawings must be sent in marked with some motto or device, and accompanied by a sealed envelope marked with the same, containing the full address of the competitor. The designs are judged by a committee of well-known architects, solely upon their merits, the names of the designers remaining unknown until the award is made, when the sealed envelopes corresponding to the devices on the designs are opened. To protect the interests of our advertising patrons it is stipulated that no ornamental bricks not found in their catalogues shall be used. This is really no restriction, for practically all of the leading manufacturers will be found represented in The BRICKBUILDER. To encourage the study of effective use of the commoner materials, of two designs equally good, preference will be given that showing a skilful use of ordinary bricks to secure ornamental effect.

COMPETITION NO. 3. AWARD.

Programme. It is required of the competitor to design three brick cornices of varying heights. These heights will not exceed seven, thirteen, and twenty courses respectively. Bricks on edge will be considered a course. Simple forms are advised and a skilful use of ordinary bricks will count for more than an elaborate combination of ornamental ones. The gutter will be of terra-cotta or copper, and will be additional.

Nineteen designs were submitted besides that of "Old Dominion," which was barred from competition owing to tardy arrival. Fourteen of the competitive designs are published in our plate department, prizes being awarded as follows: —

Plate 49. First prize, $10, "Siena," J. T. Maclaren, Philadelphia, Pa.

Plate 50. Second prize, $7.50, Coat-of-Arms, Jas. C. Green, St. Louis. Third prize, $5, "Cornish," W. W. DeVeaux, New York City.

Plate 51. Two fourth prizes, $3.50 book, competitor's selection. "Classicus," Will S. Aldrich, Somerville, Mass., and "Nixy," Raymond F. Bocorselski, Hartford, Conn.

Plates 52 and 53. Four fifth prizes, subscriptions to THE BRICKBUILDER for 1892. The Rising Sun, Max Foester, St. Paul, Minn. "Allesame," Harry Edward Prindle, New York City. Black Cross in Circle, H. G. Fletcher, Somerville, Mass., and "Brique," G. F. Crump, Albany, N. Y.

Plates 54, 55, and 56. Designs awarded honorable mention. To these competitors the paper will be sent free for the last half of the present year. "Don," W. P. Crabtree, New Britain, Conn. "Non Nemo," Chas. H. Cullen, Hartford, Conn. "Bricco," Frank W. Whiton, Hartford, Conn. "Pluto," Louis Sonntag, Philadelphia, and "Renaissance," Walter H. Volckening, Brooklyn, N. Y. "Old Dominion" is published without award by consent of its author, H. W. Olcott, Richmond, Va.

JUDGMENT IN COMPETITION NO. 3.

The designs for cornices submitted in this competition were, on the whole, so excellent and so varied, that the task of the jury in placing them in order of merit was not an altogether easy one, especially as in several cases the merit of the three cornices shown was unequal, so that a sheet containing, for instance, one very good design with two poorer ones took a lower place than the single design taken by itself would have entitled it to. It was stated in the programme that a skilful use of ordinary bricks would count for more than an elaborate combination of ornamental ones; for this reason and on account of the excellence of the profiles, the picturesque and varied play of light and shade, and the distinctively brick character of the designs, the sheet of cornices by "Siena" was placed first. Rich as is the effect produced, hardly any moulded brick occur, and these are of very simple form. The method of rendering here adopted is also to be especially commended as it shows clearly the effect of the design, and is not a mere working drawing of a cornice, as are most of the others. In the largest of the three cornices, the small brackets, No. 509 Ph. B., are somewhat too small for their position and the weight of cornice they carry, and at the height from the ground at which a cornice of this size would presumably be placed they would not tell as they ought to.

The designs distinguished by a coat-of-arms are placed second. They are not as rich in effect as those of "Siena," although the means employed are more elaborate. But the profiles are firm and bold, the designs have a distinctively brick character, though not so much so as those of "Siena," and are well proportioned; and while using rich detail in appropriate positions and with good knowledge of effect, are commendable in their dignified restraint. The increasing boldness in treatment as the size of the cornice increases shows a thoughtful appreciation of what would be required by the presumably greater height of the buildings to which the larger cornices belong.

"Cornish" also shows a commendable and effective treatment of cornices, which have a distinctively brick character and are well proportioned. The profiles follow too closely a single raking line. In this respect the central design is better than the other two. The gutter mouldings have too sharp an outline and too great projection. The largest cornice would have been much improved by having a plain projecting facia below the upper egg and dart course, in place of two of the moulded courses. In their position it would be better if at least every alternate brick were a header to tie these projecting courses securely to the wall.

"Classicus" submits some excellent designs, thoroughly brick in character and rich in effect. But there is a certain confusion of parts, and a want of perfect justness in proportion, which prevents these designs from taking a higher place. For instance, the central design, which is the least successful of the three, is too much like

two cornices of differing design, superimposed one on the other. Taken as a whole, the brackets do not come in the right place in the cornice.

"Nixy" is thoroughly brick in character and commendable for the very simple means employed. But although these designs would look much better when built than they do in the rather poor rendering of this sheet, and though the profiles are fairly good, there is too much sameness and lack of interest, which even with the simple means employed might have been avoided. The largest design is the least successful.

The Rising Sun shows three excellent cornices, well proportioned, of pure and refined profile; but, though suitable for execution in brick, there is nothing distinctively brick in their character. They might with equal propriety be executed in stone or terra-cotta. But for this they would have been accorded a much higher place. The facia of the central one, indeed, has a somewhat too great projection for a single course of brick, and being the top course would have to be tied down in some way to remain in place.

"Allesame" has three very interesting designs, which, however, would be more suitable executed in terra-cotta than in brick. The profile of the lower design might easily be improved and the guilloche ornament is not quite in place in the position given to it.

Black Cross in Circle gives three good and appropriate designs, but not as interesting as those previously named. The simple little cornice at the top of the sheet is the best of the three. The lower design might be very effective in certain positions, but is not of great interest taken by itself.

The designs of "Brique" are appropriate but somewhat commonplace. The brick pattern used in the larger cornice is not good in that the joints come so frequently over each other. A good brick pattern should follow naturally from the use of some good brick bond.

The designs by "Don," "Non Nemo," "Bricco," "Pluto," and "Renaissance" are also worthy of mention. The two lower designs of "Don" are interesting in that no moulded brick whatever are employed, but more interesting results could have been obtained with this limitation. The projecting courses should have been headers, not stretchers.

"Old Dominion," coming in too late, was *hors de concours*, but his designs are worthy of publication, and are therefore put in, though not as one of the designs of the competition.

THE COST OF THE CORNICES.

With a view to making this special cornice number of more practical value by saving subscribers the time and trouble of estimating the cost, we have, from the price lists of the several companies whose bricks are used, figured the cost of the face and ornamental brick per running foot. Face brick have been figured at $30 per thousand, which is higher than the ordinary price. Prices include packing and delivery on board the cars at Boston for the Philadelphia & Boston Face Brick Co.; New York for the N. Y. Anderson Pressed Brick Co.; Winslow Junction for the Eastern Hydraulic Press Brick Co.; Philadelphia for the Peerless Brick Co.; Washington for the Washington Hydraulic Press Brick Co.; Akron, O., for the Akron Vitrified Press Brick Co., and St. Louis or Belleville, Ill., for Anthony Ittner of St. Louis. While these estimates are practically correct, THE BRICKBUILDER does not guarantee them, for it cannot hold itself responsible for changes in price lists, or variations between its own and the different makers' methods of estimating. It is well, therefore, to consider them approximate only, allowing a few cents per foot for differences, and to write the manufacturers for exact figures when building is contemplated, giving total length of cornice to be built. The prices are for red brick in all cases, and the terra-cotta or metal gutter is *not* included. In correspondence with any of the manufacturers it will be necessary only to mention the designs, as they are mentioned in THE BRICKBUILDER, *i. e.*, first, second, or third design (counting downward), of "Siena," or "Cornish," or whatever motto the designs carry.

PLATE 49.

"Siena," . . . . No. 1, $0.64. No. 2, $1.02. No. 3, $1.99.

NOTE: Pattern numbered 54 should be 541, there being no No. 54 in the catalogue, and the pattern used corresponding to No. 541.

PLATE 50.

Coat-of-Arms, . . No. 1, $0.86. No. 2, $1.35. No. 3, $2.84.
"Cornish," . . . No. 1, $0.56. No. 2, $1.62. No. 3, $2.42.

PLATE 51.

"Classicus," . . No. 1, $0.93. No. 2, $2.58. No. 3, $2.85.

NOTE: In No. 1 A100 and A100a, should be A101 and A101a.

"Nixy," . . . . No. 1, $0.63. No. 2, $0.90. No. 3, $1.86.

NOTE: In No. 1 Ittner's 38 is numbered 62 in 1892 catalogue.

PLATE 52.

"Allesame," . . No. 1, $0.78. No. 2, $1.03. No. 3, $1.92.
Black Cross in Circle, No. 1, $0.67. No. 2, $1.125. No. 3, $2.55.

PLATE 53.

Rising Sun, . . . No. 1, $0.66. No. 2, $0.95. No. 3, $1.53.
"Brique," . . . No. 1, $0.70. No. 2, $1.10. No. 3, $2.04.

PLATE 54.

"Don," . . . . . No. 1, $0.82. No. 2, $0.60. No. 3, $0.98.

NOTE: The Akron vitrified pressed bricks are supplied at $20 per thousand.

"Non Nemo," . . No. 1, $1.05. No. 2, $0.94. No. 3, $3.67.

PLATE 55.

"Bricco," . . . . No. 1, $0.65. No. 2, $1.31. No. 3, $2.74.
"Pluto," . . . . No. 1, $0.75. No. 2, $1.83. No. 3, $2.48.

PLATE 56.

"Renaissance," . . No. 1, $1.15. No. 2, $1.74. No. 3, $1.80.
"Old Dominion," . No. 1, $1.07. No. 2, $1.42. No. 3, $2.99.

NOTE: As all face bricks here specified are Washington Hydraulic Press, they are figured in at $21 per thousand, the price quoted us by that company, instead of $30 as in the other designs, except that of "Don."

COMPETITION NO. 7.

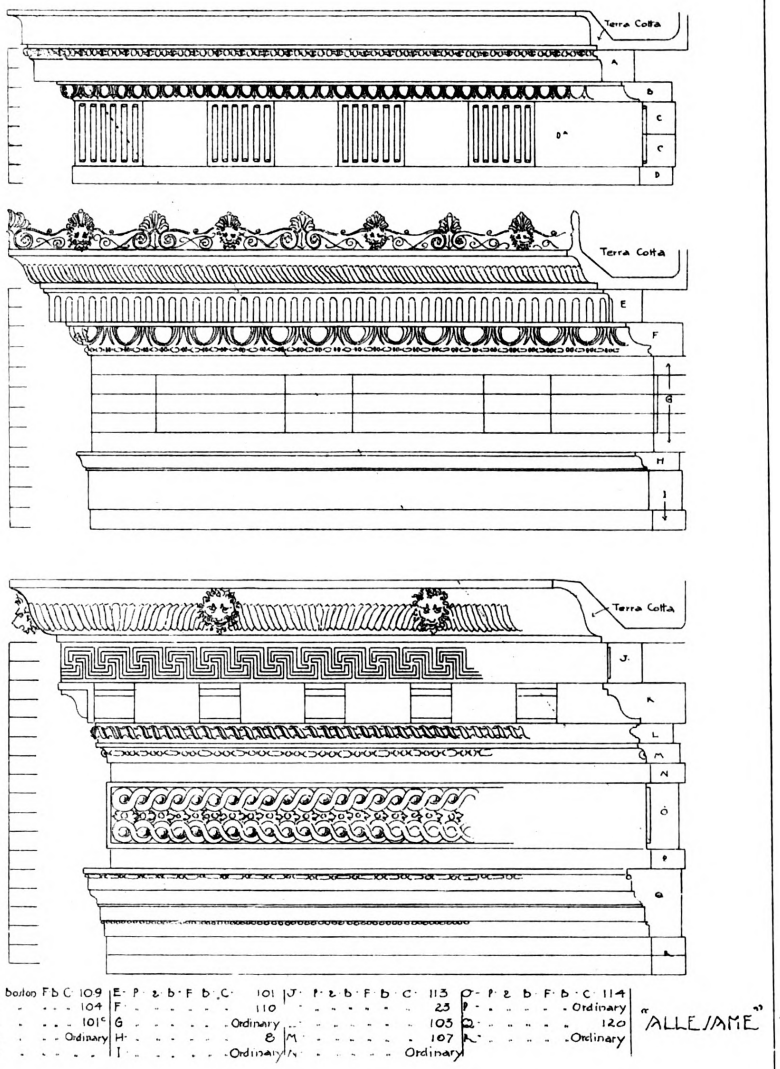
DESIGN FOR A BRICK HOUSE TO COST $2,000.

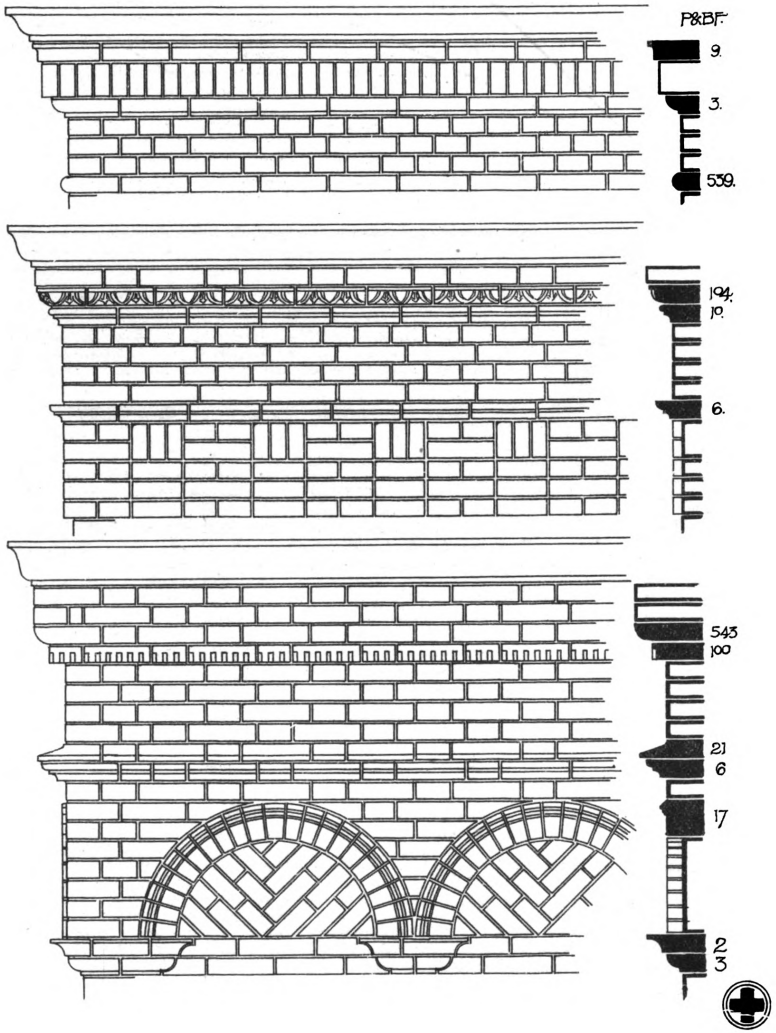
Programme. It is supposed that the designer has a client who proposes to buy a lot of 40 feet front and 120 feet deep in a suburban town or village, the streets of which run north and south and east and west. The designer may choose his own position of lot, that is, he may have it facing north, east, south, or west as he prefers, and the plan of his house will be considered in relation to this choice. His client is limited in expenditure to $2,000 for the house, exclusive of plumbing and heating apparatus, which he expects to add later, therefore provisions must be made for them. He must have a parlor or living-room, a dining-room, a kitchen with pantry and necessary closets, etc., and a staircase-hall or vestibule on the first floor, unless the stairs can be arranged to lead from the living-room. Three chambers, with necessary closets, and a bath-room, must be provided upstairs. Designers will be allowed two sheets, 18 x 24 inches, within border lines, upon which to make drawings. Plans of cellar and each floor, a front and side elevation, all to same scale, with necessary details to a larger scale, a perspective showing front and the side not shown in elevation, and a block plan of the lot showing location of house and arrangement of ground, are required. The clever placing of the house and the laying out of the yard will count in the competition, as much depends upon these points. Graphic scales for the plans, elevations, and details must be put on. The designer is restricted to the use of the two patterns of moulded bricks corresponding to 555 and 564 of the N. Y. Anderson Co., 56 and 55 of Ittner's catalogue, or 11 and 10 of the Hydraulic Press Brick catalogue. Accompanying the design must be a brief description of the materials and construction used, so that from these notes a specification could be written, and, if possible, an estimate from some responsible builder must be secured, else the jury will have to decide whether or not the design comes within the limit placed. Drawings must be delivered carriage paid at the office of THE BRICKBUILDER on or before Dec. 1, 1892.

For the four best designs equal prizes of $25 each will be awarded. The publishers reserve the right to publish any or all the other designs, and in each instance of so doing will give the author $5 and a free subscription to THE BRICKBUILDER for 1893.

THE ILLUSTRATIONS.

All the plates, 49 to 56 inclusive, are devoted to the results of our third competition, of which full particulars, together with the criticism of the jury, are given in the department of competitions on page 55.



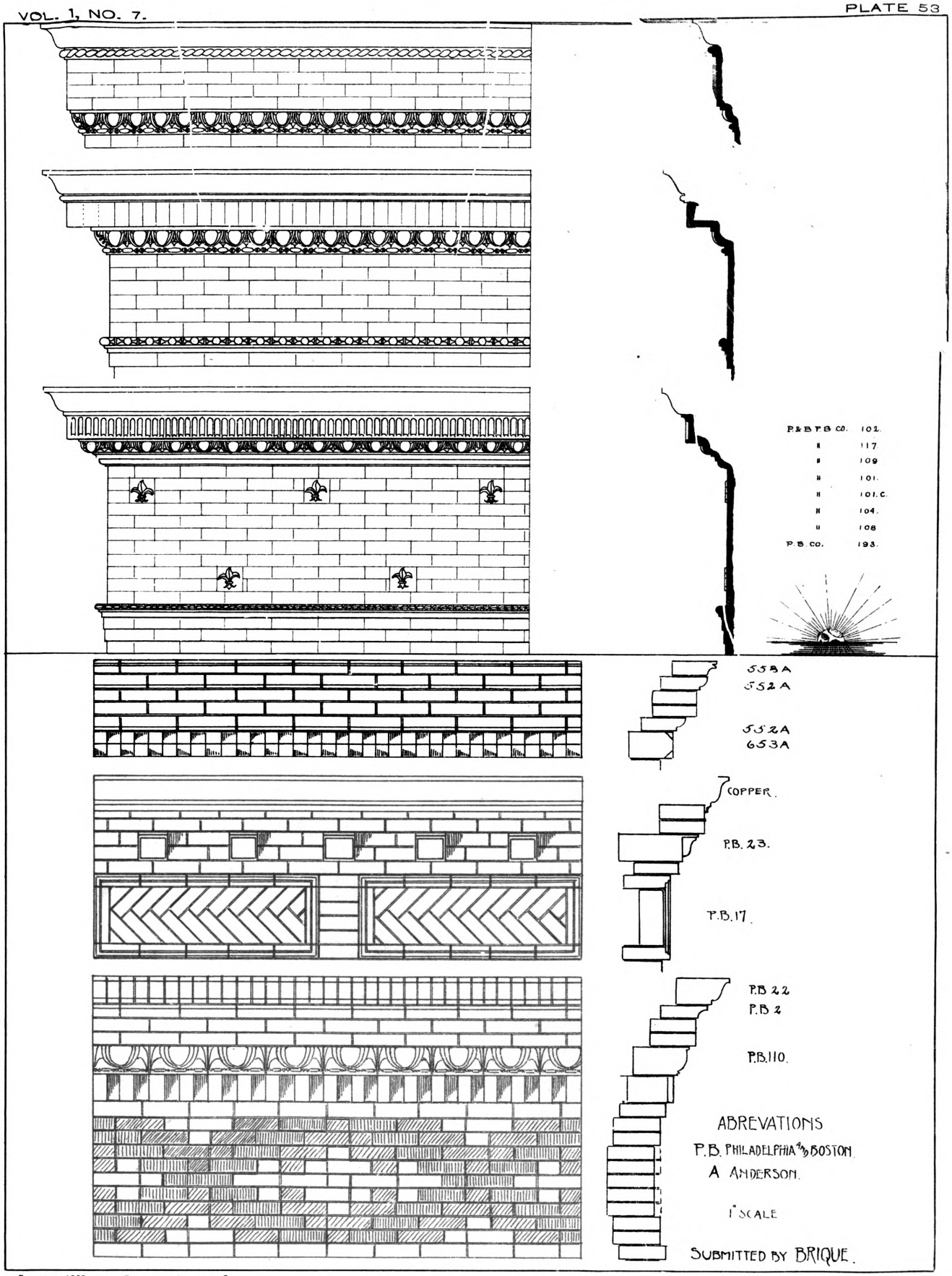


HARRY EDWARD PRINDLE, N. Y. CITY.

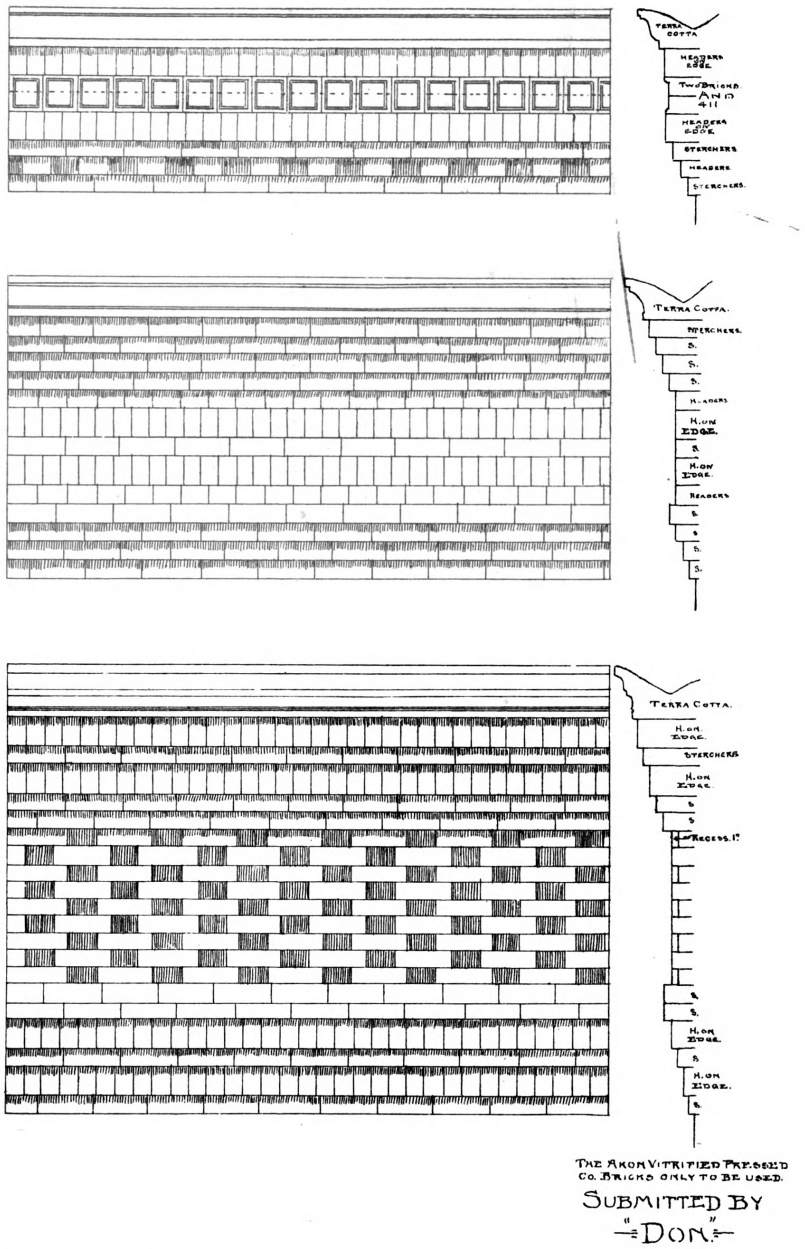
H. G. FLETCHER, SOMERVILLE, MASS.

BRICKBUILDER COMPETITION, No. 3.

FIFTH PRIZES.



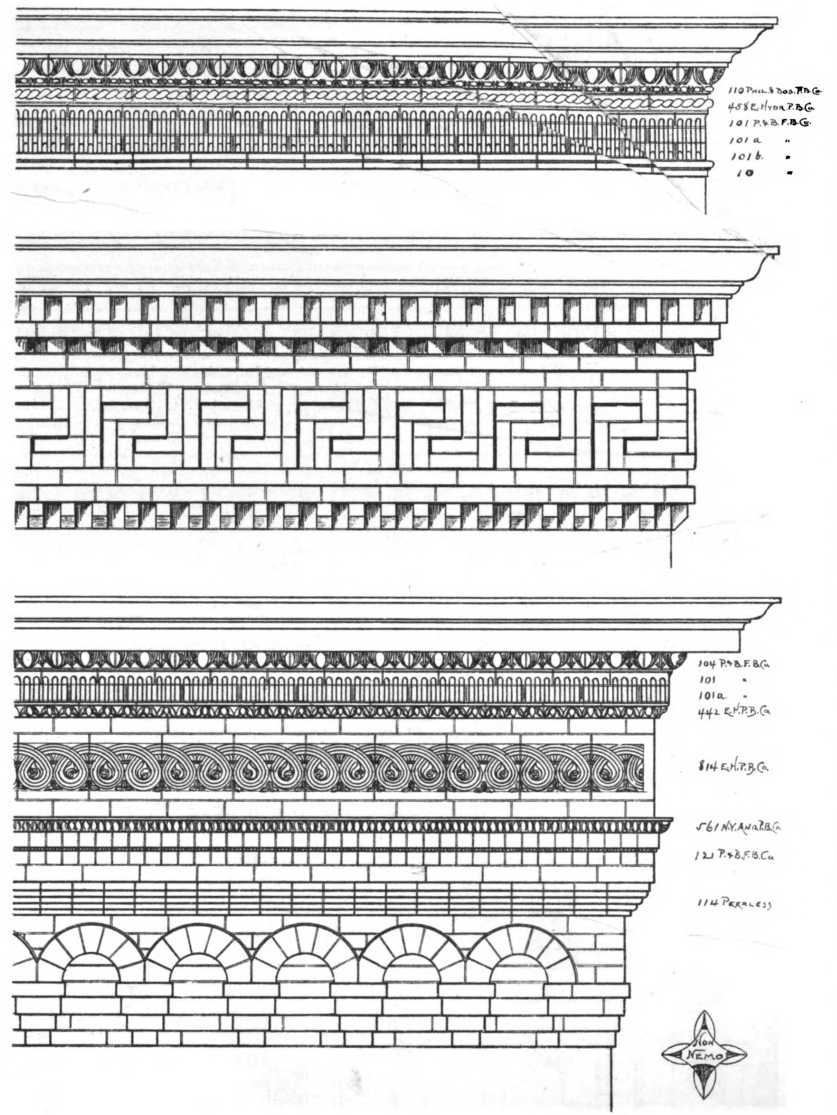
MAX FOESTER, ST. PAUL, MINN.
G. F. CRUMP, ALBANY, N. Y.
BRICKBUILDER COMPETITION, No. 3.



THE AKON VITRIFIED PRESSED CO. BRICKS ONLY TO BE USED.

SUBMITTED BY

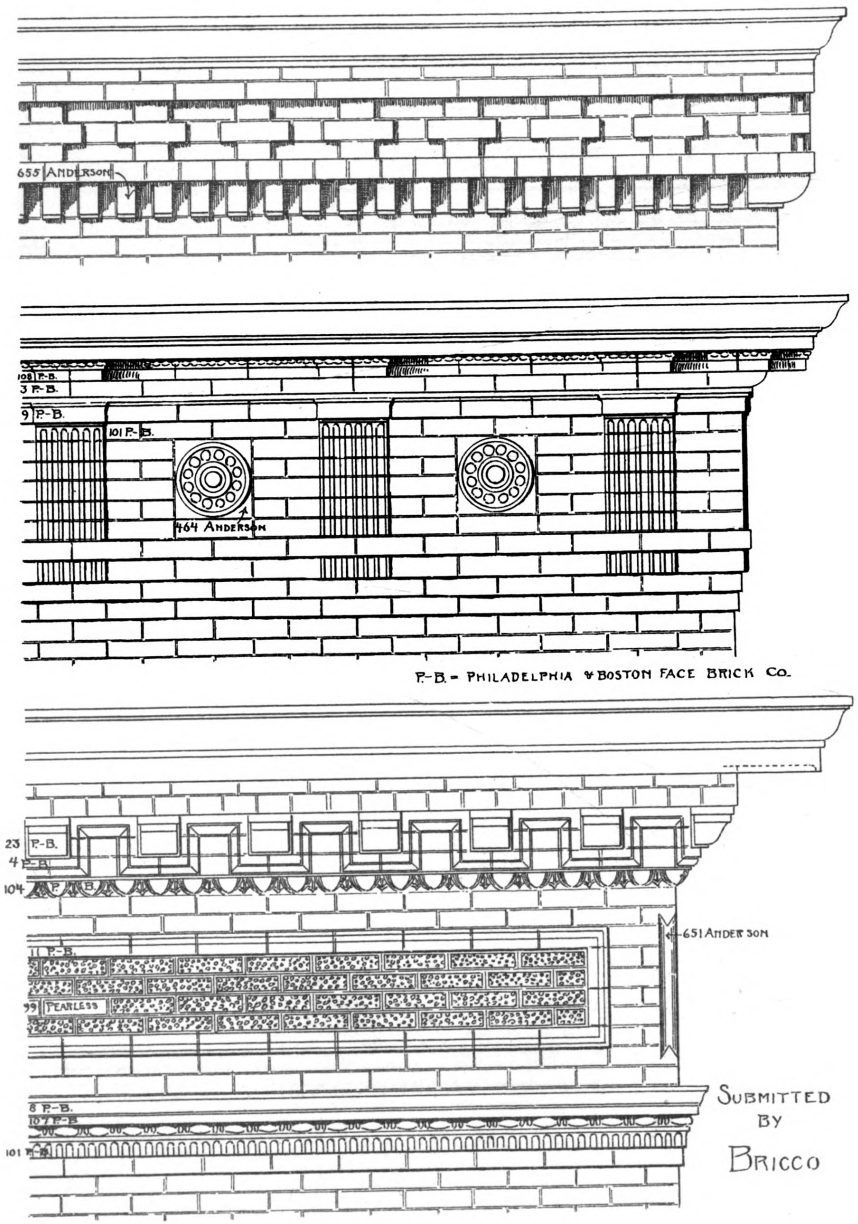
"DON."

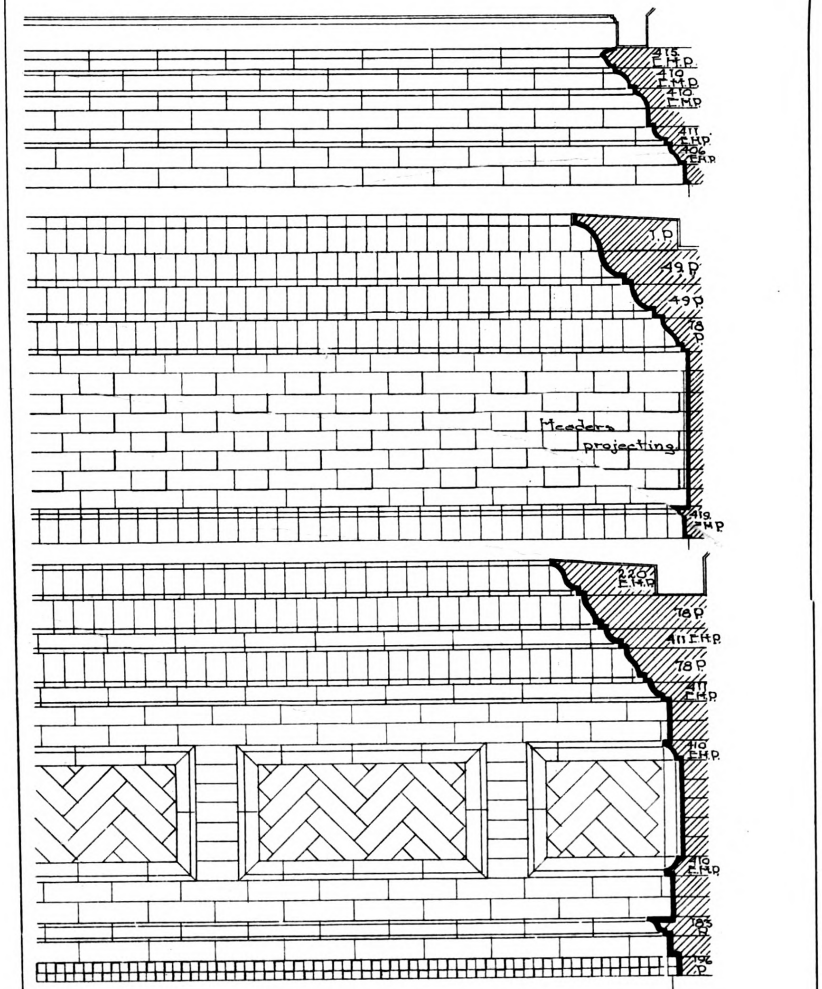


W. P. CRABTREE, NEW BRITAIN, CONN.

BRICKBUILDER COMPETITION, No. 3.

CHARLES H CULLEN, HARTFORD, CONN.



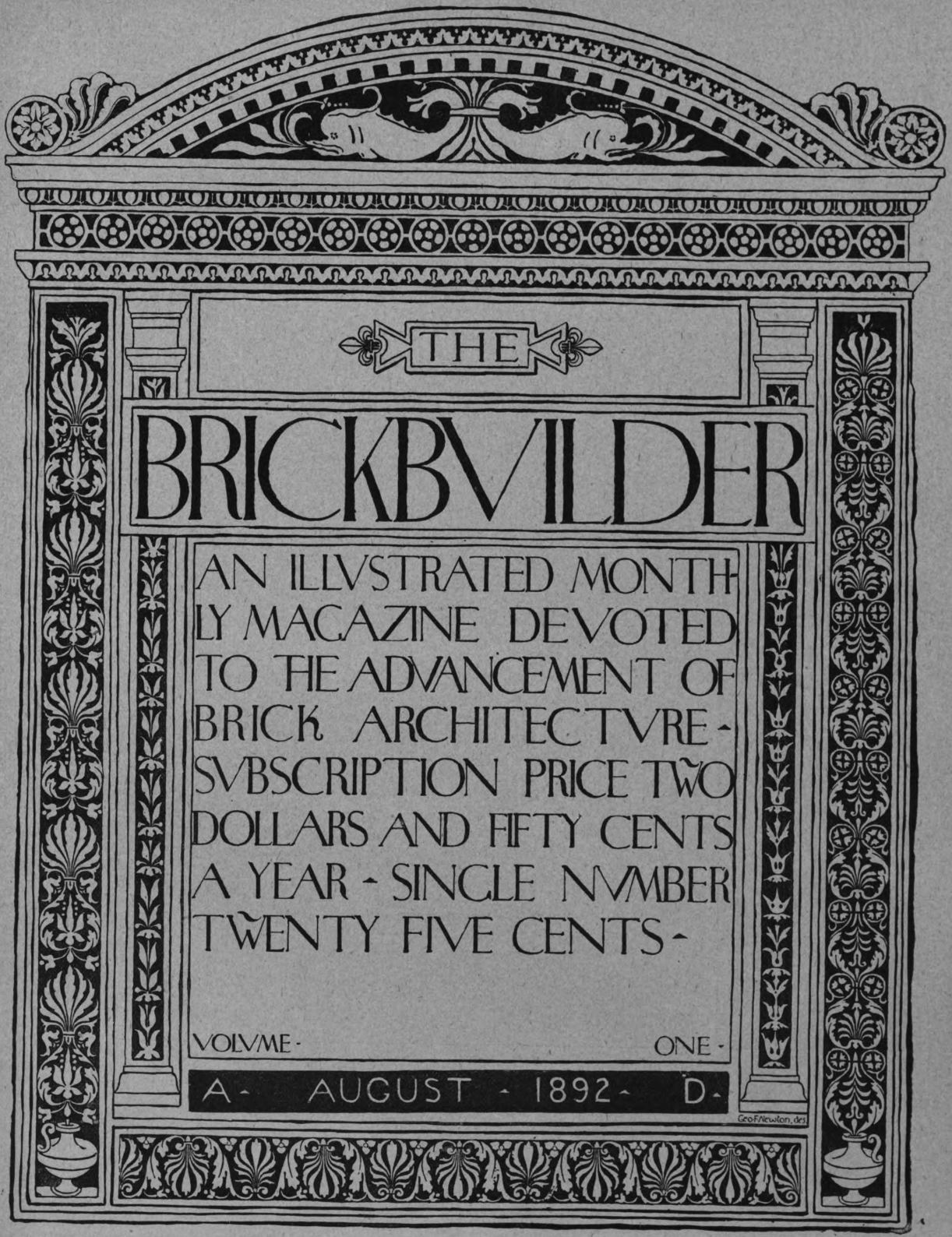


FRANK W. WHITON, HARTFORD, CONN.

BRICKBUILDER COMPETITION, No. 3.

HONORABLE MENTION.

LOUIS SONNTAG, PHILADELPHIA.



THE COLLINS PRESS, 15 MILTON PLACE, BOSTON.

The Brickbuilder.

VOL. I. BOSTON, AUGUST, 1892. No. 8.

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF BRICK ARCHITECTURE

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As is so often remarked, "there are bricks and bricks," so it may be said of their makers. *The British Clayworker* recently related an instance that has probably had so many counterparts in this country, that publishers working in the interests of brickmaking have come to regard them as one of the necessary characteristics of the trade. A representative of *The British Clayworker*, introducing that paper to the English brickmakers, met one worthy, doubtless one of those "practical" men who still cling to the methods of their forefathers, who informed him that he couldn't "learn him nothing about brickmaking." The strange thing is that the representative of the *Clayworker* should not have found individuals of this class the rule rather than the exception; for in all parts of Europe precedence prevails so largely in every trade that any innovation, even though it be manifestly an improvement, has a hard fight against tradition before it can establish itself. In this country we have a large number of brickmakers who "can't be learned nothing." But, happily, we have another class who believe in thoroughly investigating every improvement that science or inventive genius offers. To this class of progressive men we owe almost all the modern methods of handling clay in its progress from the bank to the building, and we find them immediately interested in what promises to advance their trade. They are the really practical men — the men who believe that practical brickmaking means making the largest number of good bricks at the least expense of time and labor, and with the minimum percentage of loss. Their business is done in a *factory* rather than in a *yard*.

There remains the class of brickmakers whom it is almost a hopeless task to educate, who must work on in the "completeness of their knowledge" (?) until they join the great majority, or their more progressive competitors supplant them in the market. When the business is handed down from father to son there is some likelihood of innovation, for the American born son has not so great a regard for tradition, that he lets it stand in his way toward the success he sees others reaching. We may, therefore, expect a constant development in the art of brickmaking which, if accompanied by improvement in the art of bricklaying, will give us a brick architecture surpassing the work we now turn to for instruction and inspiration.

If tradition is a hindrance in the art of the brickmaker, it is as surely a help in the art of the bricklayer. The former is a mechanical art depending for its success upon the perfection of mechanical devices. The latter is an art which depends upon the individual, in whose trained hand and eye lies the success of his work. That this skill depends largely upon traditions handed down through generations is proven in the history of every art the world has known. It has remained for modern trade unionism to assert that no man shall rise in his trade, to discourage every incentive to advancement, to hold the capable workman down to the level of the incapable, without an effort to bring the incapable up to a higher standard. In the face of this condition of affairs, is it any wonder that architects dare not attempt the brickwork that they know depends for success upon an appreciative workman? They must, therefore, confine their brickwork to plain surfaces unless they know their builders well.

The beautiful belt courses and cornices, dependent upon intelligent brick cutting and laying, which are found in such numbers in the brick countries of Europe, must give place to mechanically cut and stamped sheet metal, or to expensive terra-cotta, until men are allowed to cut and lay bricks in the method of the artist, and not the machine. As it is now, a brick of unusual color or texture is limited in decorative use to the simplest forms of bricklaying. The large manufacturers make ornamental bricks to correspond with their different shades of pressed brick, but who makes a moulded brick to go with common bricks? Only the other day we received an inquiry from an architect, for the name of some maker who supplied ornamental bricks to correspond with common bricks. We knew of none, and we doubt whether such bricks would find a large enough market to pay for making them, for they would have to combine accuracy of form with roughness and variety of texture. But the architect who can get his designs executed, will find that the most artistic work is within reach of his common bricks. As an instance we would refer to the building for the Ludlow Mfg. Co., an elevation of which, with details, was published in the January number. This building, which is of the simplest design, is crowned with one of the most successful cornices in Boston, and yet this cornice depends wholly for its effect upon the clever cutting and laying of common bricks.

The use of bricks in enclosing walls, or fences, and entrances, offers a large field for effective work that has been to a great extent neglected in this country, and it is something that we are at a loss to account for. Over-burned bricks, culls, and "bats," not salable in the ordinary market, can be used to good advantage and with artistic effect in walls which we would like to see replace the hideous picket fences that disfigure our smaller cities and towns all over the country. This disfigurement has led to the entire abolishment in many places of fences of all sorts, resulting from a combined movement among public-spirited citizens. But there are instances, and they are in the majority, when we think a boundary wall or fence a necessity, often as much for appearances as to serve as a barrier. The readiness with which brick lends itself to this class of construction is proven by numerous successful examples here, and many more abroad; and when it comes to building entrance gates, who shall say that the entrance to Harvard University should have been else than brick? At a rough estimate there are 20,000 and upwards of property owners in this country interested in brickmaking. How many have their property enclosed with a brick wall? The writer remembers calling at the residence of a brickmaker in Trenton, N. J., a substantial brick house located on a corner, the lot

surrounded with a hideous iron fence, the choice stock pattern of some "architectural iron works." Within the yard grew a variety of flowering shrubs and climbing vines that evidenced a very good and marked taste in this direction on the part of the proprietor. By using culls from his yard, and being at no expense except for labor, in place of his expensive iron fence, he might have had a low wall over which some of his climbing vines could have run, and thoroughly establishing themselves, made a thing of beauty out of what, in that location, was a necessity.

Looking towards a wider use for bricks, would it not be a step in the right direction for those most interested, *i. e.*, the brickmakers, to set an example in the use of brick in walls, that would be followed by many other property owners? It would not be difficult to induce mason builders and contractors to follow the brickmakers' lead, and if necessary it would be a paying investment for the manufacturer to furnish, free of cost, the bricks necessary in these cases. Possibly the most necessary step towards such work is the providing of suitable ideas, and to this end THE BRICKBUILDER will institute a competition in the near future, which, if as successful as our cornice and mantel competitions, will provide no lack of ideas for brickmakers to begin the campaign with.

The competitions we have been conducting have, in some respects, been exceedingly satisfactory, both in point of number of competitors and quality of the work; but there have been certain shortcomings arising mainly from not wholly understanding the essentials of the problem, and these we believe can be done away with to a large extent, by publishing previous to the competitions critical articles, prepared by able writers, clearly explaining the functions of the architectural motives chosen for the competition. These articles, illustrated by the best models to study, will give all competitors a straight start and save them from many of the errors that now make their work imperfect. They will, however, be prepared with a first view to their general value and usefulness to the majority of our readers, and their bearing on the competitions will be secondary. But as we have for some time had in view articles of this nature, it will be easily arranged to have them correspond, in subject and time, to certain competitions.

Designers using ornamental bricks are often very prone to forget the nature of the material they are working with. Their designs might as well be executed in stone, indeed, in most cases stone would be better, for they ignore the joint entirely. Then, too, mouldings in brickwork can never be made to have the regularity of well cut stone, yet for their effect these designs depend upon precision in execution. Instead of developing the brick characteristics in their designs, they bring in characteristics of an entirely different material and endeavor to force their brickwork to carry these. When failure results, it is because these foreign characteristics are the prominent and unsatisfactory features of the design. A glance through the cornice designs published in the last number, and the mantels published in this number, will reveal this shortcoming. The jury, in deciding the competition, has awarded rank to designers who, while possibly not so successful in matters of proportion, distribution of ornament, and general points of design as some of their competitors, have shown a clear understanding of the qualities of the material to be used in the execution of their designs, and not furnished a nondescript thing, adapted to wood, stone, putty, or whatever material can be made to take and hold a certain form. Many of the ornamental bricks used have apparently attracted the designers by their refinement and fidelity to their historic models. These same details designers have seen worked out in stone in the most beautiful buildings of the Renaissance period, and admiring the details and the designs have, in adapting them to the problems given, overlooked the fact that the difference in materials interposed wholly different conditions of design. In fact, some of the designs could be worked out much more easily in stone than in brick. The finest examples of brick architecture in the world do not show unsuccessful attempts to produce the delicate and refined details of carved stone, or the accurate workmanship of carefully dressed and laid stonework. They have beauty of an opposite sort, when not dependent upon the precision with which minute motives are executed. Their detail is not coarse, but it is not "finicky." It is all that can be desired in proportion and distribution of parts, but the fact that it is brick detail is never lost sight of.

A writer in "Stone," who is in a position to know, says that the granite cutters lost in wages and assessments during the recent long strike enough to buy and operate the leading quarries in New England. He estimates the loss to the strikers at $2,800,000, and his estimate is probably nearly correct. This shows pretty clearly where the strike hits hardest. The quarries are still there. The owners may have lost a portion of this year's profits, but they have lived comfortably, and the strikers have not.

TO CONTRACTORS AND BUILDERS.

To those builders to whom this number of THE BRICKBUILDER shall come as a sample copy we request their kind consideration of its merits as a business help.

There are a number of very meritorious periodicals devoted to elevations and details of frame buildings, but there seems to be a demand for a periodical furnishing details of the brickwork that makes a part of almost every building.

Such a periodical THE BRICKBUILDER aims to be.

For instance, this number contains a fine selection of brick fireplaces, wholly new and original, with details so complete that a master mason can build any one of them directly from the plates of the paper. The number following will contain several original designs of chimney-tops, also arched windows. The April number contains designs of two-story store fronts. The May number was largely devoted to the elevations and details of a brick church, designed expressly for our paper by Mr. J. A. Van Straaten, Jr., of Boston, and which has received high praise for excellence from some of the leading architects of the country. The July number contained forty-five original designs of brick cornices.

In addition to these extremely practical features we have been favored by many of the prominent architects of the country with elevations and details of brick buildings, designed by them, which have never before been published, and we have the promise from a large number of others that when they have any distinctively brickwork ready for publication, it will be contributed to our plate department.

During the year we shall insert twelve supplements, being photographic reproductions of famous brick buildings, mostly of foreign countries.

We hope you will be favorably impressed with THE BRICKBUILDER, and we respectfully solicit your subscription. The price is $2.50 a year. Your local checks will be accepted at par.

To subscribers the paper is mailed flat, not rolled or folded.

THE BRICKBUILDER PUBLISHING CO.

TERRA-COTTA AS A BUILDING MATERIAL IN ENGLAND AND OTHER COUNTRIES.

"And the bricks are alive to this day to testify it."
Henry VI., Part II.

The use of terra-cotta in building is not a new custom, but a revival in England, and the merit of reviving it is to be attributed to Josiah Wedgwood, who founded large works in Staffordshire in 1770. But of late years it has been used in steadily increasing quantities, its rich colour being very grateful to the eye in our murky atmosphere, while it is peculiarly adapted for resisting the effects of the English climate. The term "terra-cotta" "has now come to be applied," says Mr. James Doulton, "exclusively to that class of ware used in the construction of buildings which is more or less ornamental and of a higher class than ordinary bricks, demanding more care in the choice and manipulation of the clay, and much harder firing, being, consequently, more durable and better fitted for moulded and modelled work." This is a modern definition, but in the broader sense of burnt clay, terra-cotta plays a great part in our knowledge of prehistoric man, being one of the most indestructible things on earth, surviving when marble and granite have mouldered or crumbled away. Bricks and jars and figures of clay are sometimes all that is left to tell the tale of some forgotten people. The Assyrians and Egyptians used burnt bricks and tiles as well as sun-dried bricks, and the former have resisted the attacks of time far better than the latter, as they differ from them in having undergone a chemical change in burning. If Egyptian sun-dried bricks, which have been exposed to the rays of an almost vertical sun for three thousand years, are put in a kiln to be burned, they become damp and plastic before turning into hard bricks, and radically changing their character. The Greeks built chiefly with stone, but the exquisite figures from Tanagra, etc., and innumerable vases, the finest belonging to the third or fourth century, B. C., testify to their skill in the manipulation of clay. The Romans used clay very extensively for all sorts of decorative work, sometimes working it with a chisel instead of using a mould. They carried their skill in pottery with them over Europe. Roman pottery is constantly met with in England; and at Castor, in Northamptonshire, a kiln and potter's tools were discovered and also a moulded arch and hypocaust bricks. The golden age of terra-cotta manufacture was the fifteenth and sixteenth centuries, when it was carried on to a great perfection in North Germany, the Low Countries, parts of Spain, and most especially in Lombardy; the Certosa, and the churches of Santa Eufemia, San Francesco, etc., at Pavia, the cathedrals of Crema and Monza are well-known examples. The exquisite enamelled terra-cottas of the Della Robbia family belong to the fifteenth century.

After the departure of the Romans there are few evidences of bricks being used in England before the fifteenth century, except in cases such as St. Alban's Abbey, where the bricks used were taken from Roman ruins. From about 1450 until after the reign of Elizabeth, terra-cotta was only used in large and expensive buildings, but the introduction of the Tudor style gave a great impetus to the use of moulded bricks. The ornamental work of the manor house at East Barsham and the parsonage house at Great Snoring, both in Norfolk, are excellent examples of terra-cotta work in the reign of Henry VIII. There are four circular terra-cotta panels at Hatfield Peveril, Hants, which were designed by Holbein and originally decorated the gateway of York Palace, Whitehall. The use of terra-cotta seemed to die out again in England after Queen Anne's reign. Little Wenham Hall, Suffolk (1260); Oxburgh Hall, Norfolk (Edward IV.); Eton College (Henry VI.); Hampton Court Palace (Henry VII.); Holland House (1607), are good examples of what still remains of English terra-cotta work before the modern revival.

About 1790 there was a slight temporary revival of the use of terra-cotta in building. A manufactory was started in Lambeth, which supplied the frieze of the Italian Opera House in the Haymarket, and the caryatides and other ornamental work on St. Pancras Church.

The following are some of the qualities of terra-cotta which are instrumental in its increasing popularity: —

1. Its indestructibility and freedom from decay by the action of the weather; the acid gases in the air have no effect upon it; the deposited dirt and dust wash off with the first shower, and the work comes out as pure and distinct as at first. Mr. Doulton has pointed out the freshness of the terra-cotta at Buckingham Palace in contradistinction to the decayed stone. The florid ornaments and skyline of Dulwich College are as fresh as when first put up. It may be noticed that the terra-cotta capitals of the columns of All Souls' Church, Langham Place (supplied in 1822 by Messrs. Coade), are still fresh, while the Bath stone is very much decayed.

2. The possibility of multiplying any form from which a mould can be made.

3. It is cheaper than the better sorts of building stone, and is so easily moulded that for intricate work or elaborate carving the difference in cost becomes very considerable. The more elaborate the design the greater the economical advantage of terra-cotta.

4. It is possible to enhance the effect of a design very greatly by using terra-cotta blocks varied in tint.

5. Fine effects of light and shade can be obtained by what in masonry would be undercut, but in terra-cotta is the application of separately modelled pieces of the material superimposed on the recessed parts, while all are still in a plastic state, these being burnt as a whole into a homogeneous mass.

6. Its strength compares favorably with other building materials, its resistance to compression, when solid, being one third greater than that of Portland stone. It can be used for flooring, being harder than York stone, and resisting friction well.

7. Resistance to the action of fire. Heat which would destroy stone has merely the effect of burning off the dirt from the terra-cotta, giving it the appearance of having just left the kiln.

8. Its weight is convenient; the pieces are never large, and generally hollow, and can be moved about easily on scaffolding. It weighs 121 lbs. per cubic foot when solid; but average blocks when hollow inside, with a thickness of two inches, weigh only about 68 lbs. per cubic foot.

9. The surface can be enamelled or glazed to heighten the colour where desirable.

10. It claims artistic consideration, because any delicacy that an artist can express in ordinary modelling clay is preserved in the burning, at least as durable as if copied in marble or bronze, and more accurately than is possible by the copyist; and, moreover, it gives the artist the chance of seeing the more ornamental portions of his design in full size, as the material actually built in is the same as that modelled. Of course, to balance these many advantages, there are drawbacks in the use of terra-cotta, chiefly in the difficulties of burning, and obtaining exactness of fit in continuous features; but these difficulties can be minimized by proper care and experience.

In designing a building in terra-cotta, the architect should beware of imitating stone, and adopt a different style of treatment. Bold, overhanging projections must disappear, and large forms must give way to a more bas-relief style of treatment in which colour and rich detail should compensate for the absence of broad masses and strong effects of light and shade. An examination of the brick architecture of North Italy, etc., shows that a style was adopted suitable to the material which was at hand. In Manchester the Royal Eye Hospital, Platt Church, and St. Bede's College are good examples of terra-cotta buildings. Few passers-by can have failed to appreciate the contrast of the grateful colour of the Eye Hospital to the duskiness and grime in Oxford Street.

The combination of clays used in the manufacture of terra-cotta depends, of course, on the colour and quality desired, for "clay and clay differ in dignity"; there are red, brown, buff, and white to choose from, and old stoneware ground to powder, feldspar, ground glass, etc., are used in combination with clays for special effects. Occasionally a single clay is used; for instance, Messrs. Gibbs & Canning make an excellent buff terra-cotta from pure fireclay. When the combination of the mass is decided upon, it is thoroughly kneaded or "pugged" with the necessary amount of water, to make a perfectly ductile, homogeneous, modelling clay, free from the smallest air cavities. The next process is the modelling or moulding. Sculpture, or elaborate ornamental details are modelled and at once passed through the kiln, but any repetition work — string-courses, mullions, cornices, balusters, etc. — must be moulded in plaster moulds. The makers of the plaster moulds are very ingenious in fastening them together in such a fashion that they can be withdrawn, piece by piece, when the clay is hard. Some wonderfully complicated forms can be moulded in this way; for instance, an Ionic cap, which has much projecting detail. The clay forms are left for seven or eight days in the drying rooms, which are kept at a temperature of about 75 degrees, and at the end of that time the clay is hard and stiff, and requires pressure with the nail to produce

indentation, and is ready for the very critical operation of burning. It is sufficiently close and compact to be turned on a lathe before going into the oven. The heat in the kiln is low at first, but is gradually increased until, after eight or ten days, it reaches a temperature of 1,200 degrees Fahr. The darker the colour required, the harder the firing must be. It is said that "coal should not be used in firing light-coloured terra-cotta, as, although the usual products of combustion are separate from the ware, sulphurous fuel darkens and tarnishes the surface."

The kilns are generally circular, and the heat is carried to the top through flues in the walls; then the kiln being covered and the draught towards the bottom, the heat descends.

Glazed terra-cotta may be either transparent — covered, as it were, with a film of glass — or opaque, like an enamel. Transparent glaze is produced by throwing salt into a specially constructed furnace when the wares are at a high temperature, or by dipping the ware, after once burning, into a bath of oxide of lead and tin, and then burning it again. Opaque glaze is formed by dipping the ware before burning into a slip formed of superior clay, very finely worked, and brought to the colour required, the object being to give a superior appearance to that presented by the ordinary burnt material. The solutions for enamels of different colours are all of dull gray tint before burning, which brings out the rich reds, yellows, etc.

This enamelled terra-cotta resembles the Della Robbia ware of the fifteenth century. Thus modern science is laboriously rediscovering old secrets and imitating the arts of four centuries and forty centuries ago. Perhaps if our "gilded loam and painted clay" can be brought to Assyrian perfection, the Australian, American, and the New Zealander to come may read the history of London in the ruins of the Natural History Museum at Kensington, the Royal Opera House, Shaftesbury Avenue, the Constitutional Club, Northumberland Avenue, or in those of the Prudential Assurance Buildings, Holborn. LOCKE WORTHINGTON.

LONDON, 1892.

BRICKMAKING AND BRICKBUILDING IN NOVA SCOTIA.

The extensive forests in this country, causing comparative cheapness of wood as a building material, has tended much to retard the general use of bricks in the construction of buildings, public as well as private. Outside of the capital city, and a few of the larger towns, it is rare to find a brick dwelling; the few which may be seen are crude in appearance and entirely devoid of any ornamentation. The idea that a brick building can be made handsome in appearance, without the use of face or repress brick and stone trimmings, has yet to be developed.

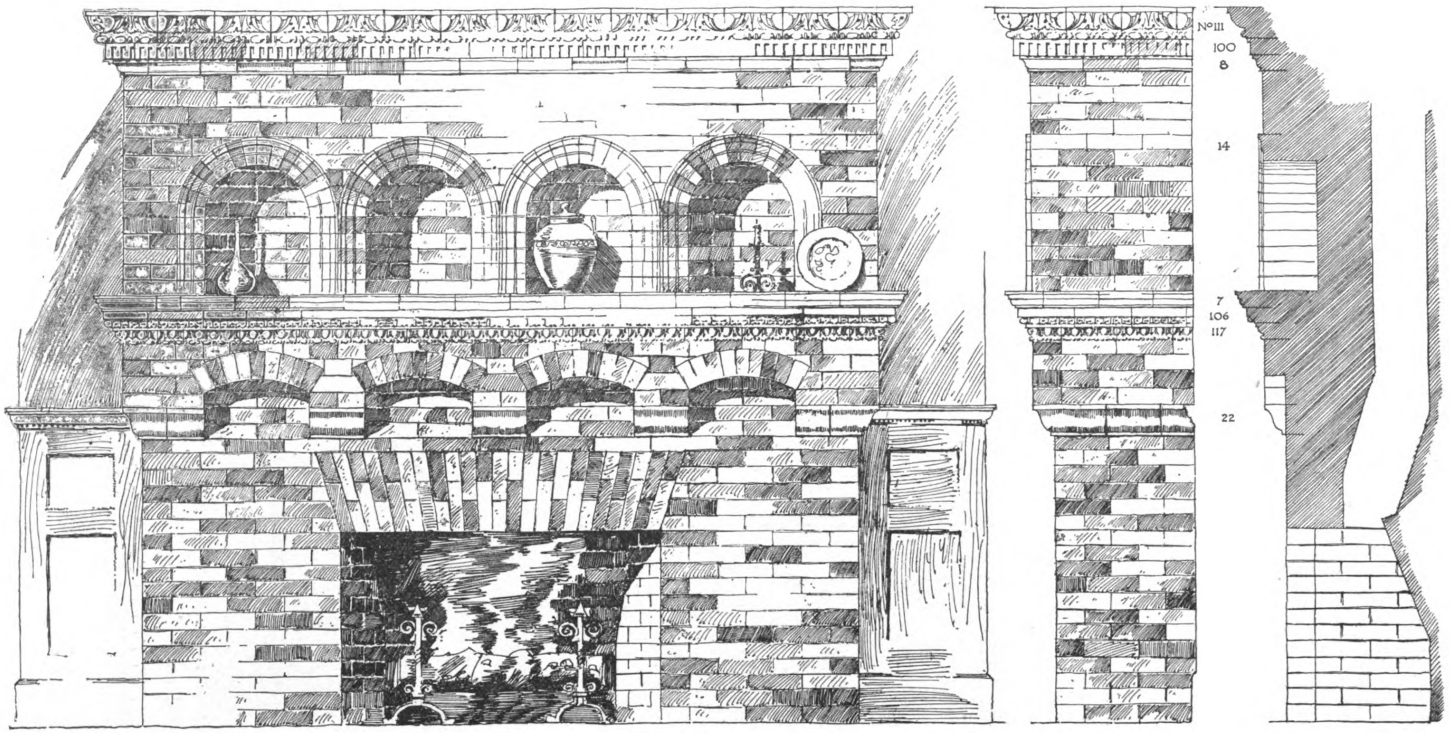
Face brick commands a high price, and stone trimmings are expensive and beyond the reach of the ordinary builder. A prejudice also exists against brick amongst many, on the ground that a dwelling constructed of this material is liable to be damp. This is owing to the hitherto defective mode of building, no air space being left in the outer walls. However, of late years, this factor is recognized, and almost any one now understands that a brick building can be rendered more comfortable for winter or summer use than one built of wood. Again, there are in the rural districts of the province very few skilled masons and no regular bricklayers. What we have are fairly good all round men; they will build a rubble foundation, lay a brick wall, or lathe and plaster in a plain, unpretending manner. It is quite easy, on the other hand, to find a carpenter skilful enough to build you a wooden house in the very latest approved modern style, and just as easy to obtain the manufactured lumber from the many saw mills, planing and moulding mills, and sash factories to be found in any ordinary sized town. The tourist from your country who, anxious to escape the siroccos of your heated cities, and lured by the many press notices this year of our country, to spend their vacation with us, have seen in our rural districts many dwellings which attest to the skill and æsthetic taste of the worker in wood and the excellence of the painter's art.

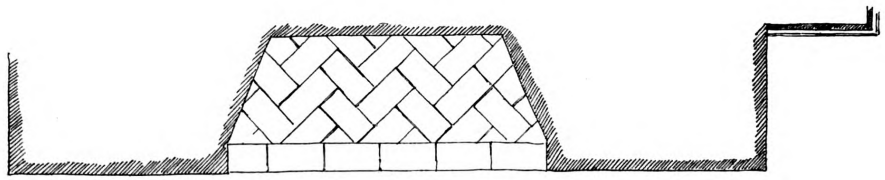
Brickmaking in this country is only in its infancy. You can count the brick-yards on your ten fingers, and yet the country is full of the material for making red brick of the finest description. With two or three exceptions, the operation of brickmaking is conducted by hand. The clay is mixed in an old-style pug mill turned by a horse, the bricks are struck by hand, laid on the ground to dry, — if it rains to be washed away, — hence the common brick are roughly made, as a rule, and utterly incapable of making a finished wall. The exceptions, where steam is the motive power and brick machines used to strike the brick, are in this Country, with one other yard I understand in Pictou County started this summer.

The brick made by the International Brick & Tile Company, whose works are situated here, are moulded automatically in one of Creager's machines driven by a forty horse-power engine. This company makes only common brick, but their brick have such smooth faces and square edges that they are being used for some purposes instead of face brick. The clay on the property of this company is of a superior quality, entirely free from grit, and is taken direct from the bank to the pug mill. When moulded, the brick are dumped on pallet boards and placed in racks to dry, this being the only yard in the province in which the brick are dried in this way. In all the yards the brick are burned in the old style of kiln. Wood is now used as fuel, and at present it is comparatively cheap, but the time will come when coal must take its place. There is not a "Eudaly," "Hoffman," or "Perfect" kiln in the country. Time and again I have urged the management of the company with which I have the honor to be connected to investigate the merits of the new and modern mode of burning, as compared with the old, and, in my view, expensive, wasteful, and antiquated methods, but without success. However, as everything comes to him who waits, I yet hope to see a modern kiln as part of our plant. No ornamental brick is made in the country, and as for terra-cotta it is unknown. Pressed brick is made in some of the yards, but they are manufactured by hand machines of antiquated construction. I should like much to see a Raymond or some other of the repress machines with which your manufacturers produce the beautifully moulded forms of brick and terra-cotta shown in the catalogues I have seen, and embellishing your fine and artistic brick edifices. Speed the day when ignorance and folly shall give place to the beautiful and edifying, as well as useful, in the construction of our residences and public buildings. Then may we hope to see brick predominating in our rural towns and settlements as the material of which to construct our dwellings, and such dwellings as shall combine art with utility, and which will not require constant repairs and the application of paint every now and then to keep up appearances.

To return, the Annapolis Valley, or "Evangeline's land," as it is now poetically known, contains vast deposits of argillaceous clay which becomes, when burnt, of different shades of red, from a bright toned terra-cotta to a deep cherry; just beside these deposits of clay are often found beds of sand sharp and fine, most of which can be used without screening. Moulding sand mixed with iron pyrites can also be obtained for experimenting in coloring, but usually with our clay it is not necessary. I have lately met with a description of kaolin which, if properly treated, can be made into buff brick or terra-cotta. It awaits only enterprise and capital to produce the manufactured article. We have the raw material, and the market will soon create itself. Our red clay, also, is most suitable for drain tiles; being free from grit or stone, it can be easily worked through the tile machine. The market for this class of goods in a few years will be practically unlimited, as underdraining is just coming in vogue.

Your suggestion in the June number of your valued journal is worthy of every consideration. I would that THE BRICKBUILDER could be placed in the hands of every builder, mason, and architect in the country. How it would stimulate the brick business, and what substantial dwellings of imperishable material would be erected! Now, what are the possibilities of the brick business in this country? Much every way. But first we require to manufacture ornamental and moulded brick, and also fine face or repress brick to combine with our common brick. In this valley alone, from Windsor to Annapolis, and along the line of the Windsor and Annapolis Railway, a distance of ninety miles, there are not less than fifteen growing towns. These towns are rapidly extending their borders. Situated in the midst of a rich agricultural and fruit district, — within a few miles of the South Mountain range, noted for its vast deposits of hematite and other iron ores, — they are becoming centres of business; and more, they are becoming the resort of the American tourist, whose wants must be attended to in the erection of summer hotels. Many of these towns are already provided with water works and electric light systems, while the telephone connects them with Halifax on the east, and Yarmouth on the west. The natural development of this valley without any phenomenal increase will furnish a market for double the present output, if brick, instead of perishable wood, were used for building purposes. The people would





PHILADELPHIA AND BOSTON FACE BRICK COS BRICKS.
PRICE IN RED $64.18
WIDTH OF BREAST 8'10½" OPENING 4'0"·25"

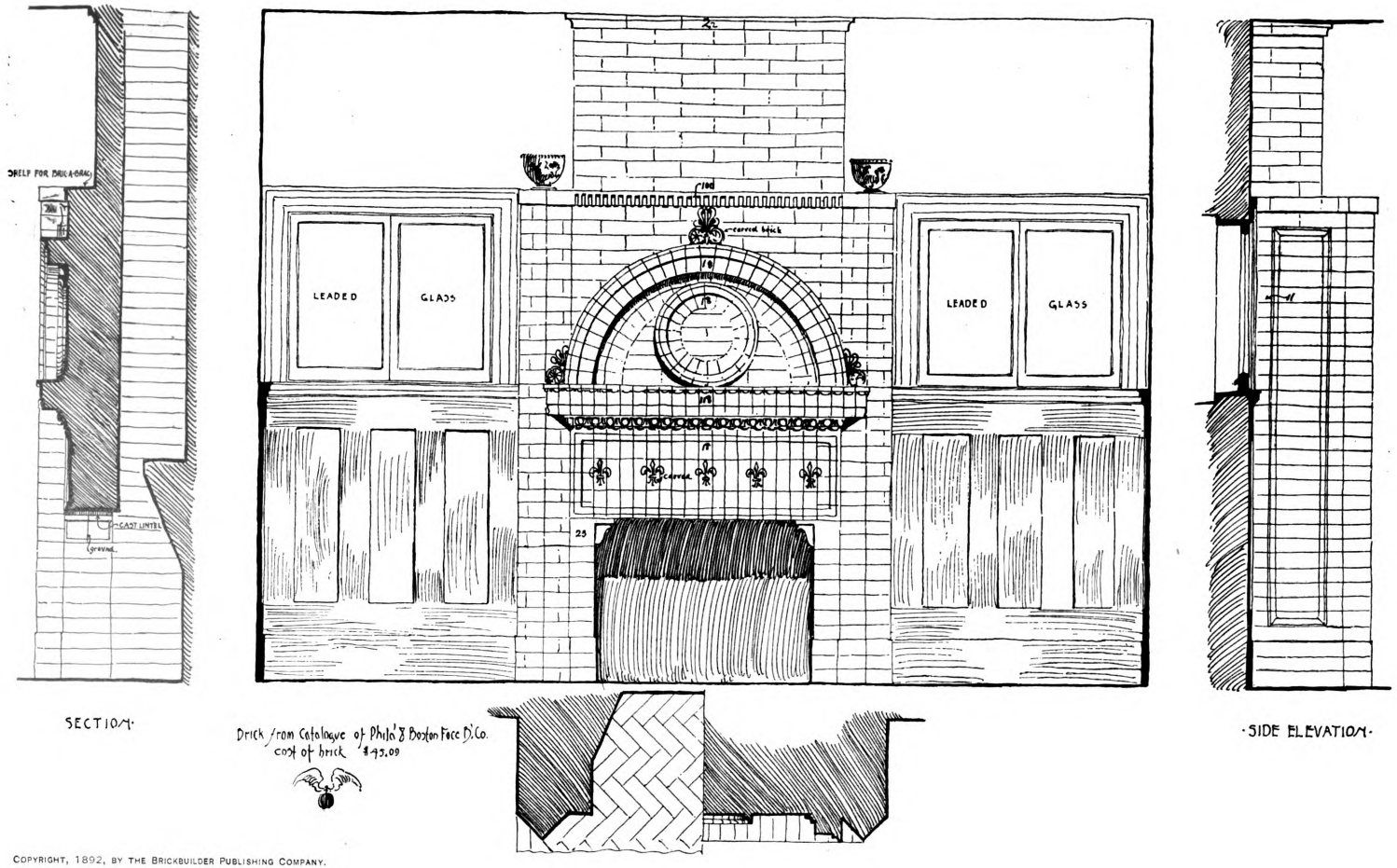
"Yule Log"

FIRST PRIZE.

J. T. MACLAREN, PHILADELPHIA.

BRICKBUILDER COMPETITION, No 5.

DESIGN FOR A BRICK FIREPLACE.



SECOND PRIZE.

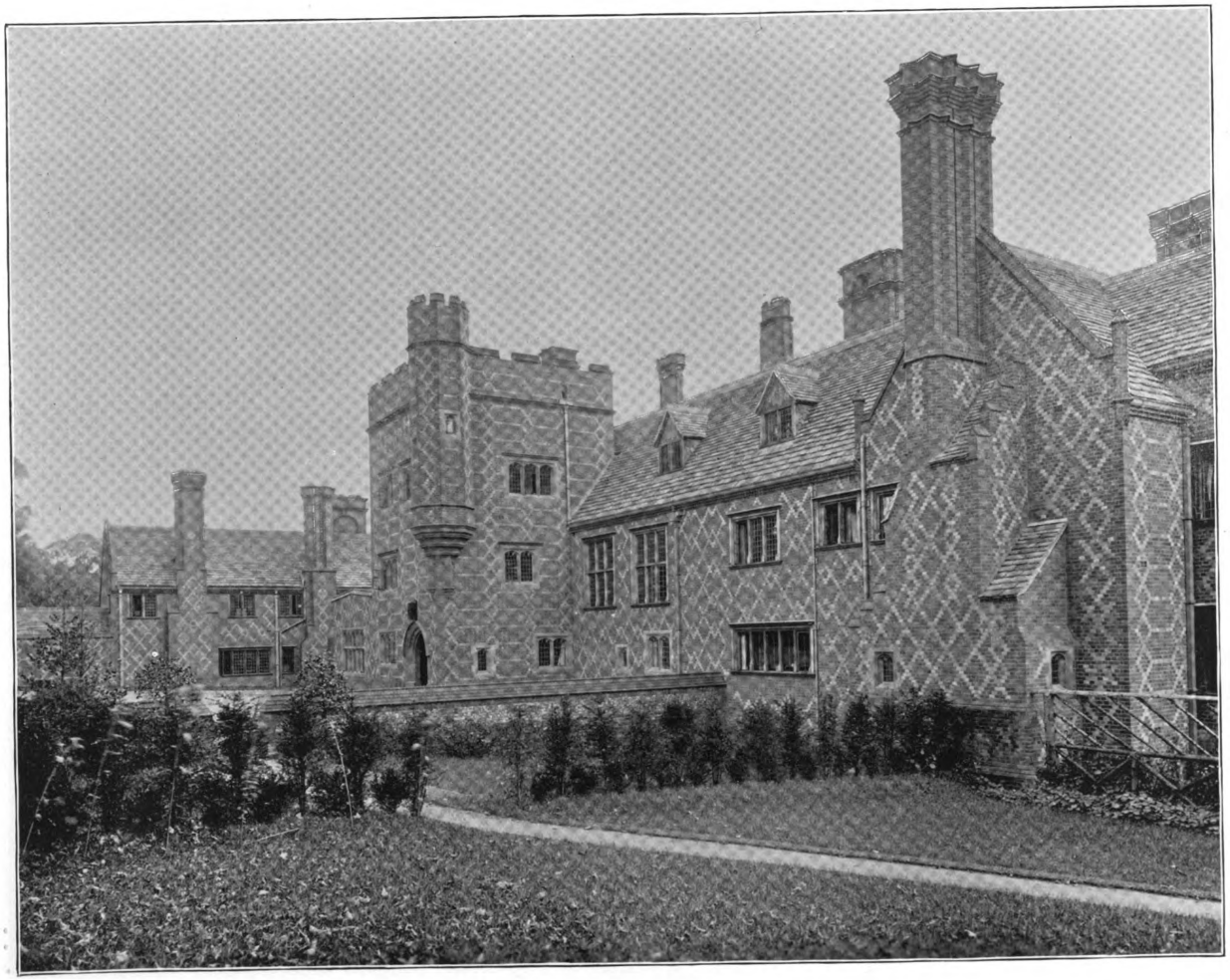
G. F. CRUMP, ALBANY, N. Y.

BRICKBUILDER COMPETITION, No. 5.

DESIGN FOR A BRICK FIREPLACE.

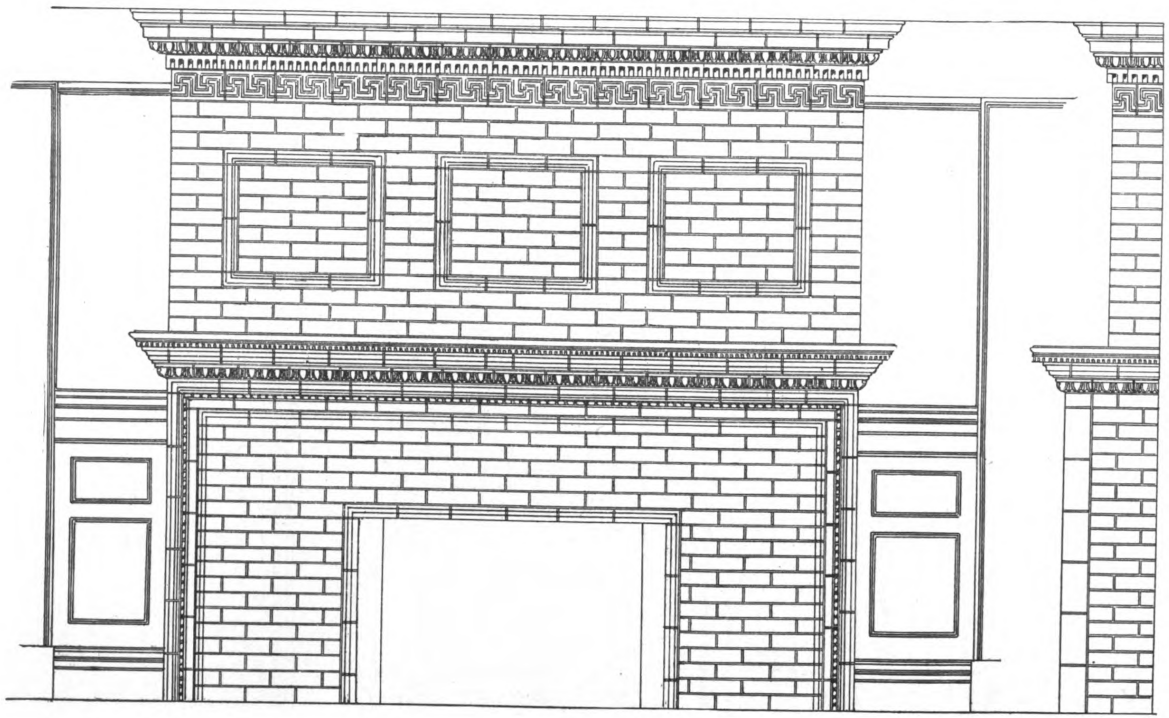
SUPPLEMENT TO THE BRICKBUILDER.

AUGUST, 1892.

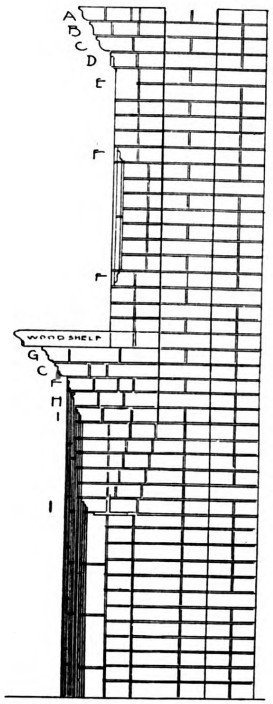


VIEW OF SHIPLAKE COURT, ENGLAND, FOR R. W. C. HARRISON, ESQ.

ERNEST GEORGE AND PETO, ARCHITECTS, LONDON.

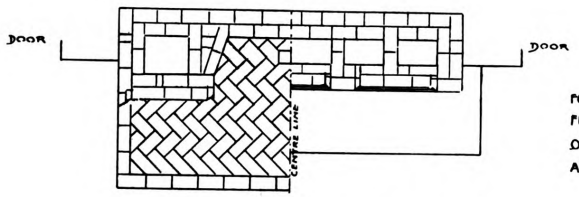


FRONT ELEVATION.



SIDE ELEVATION

SECTION THRO CENTRE.



½" SCALE PLAN OF HEARTH ½" SCALE PLAN OF SHELF

FORTY FIVE DOLLARS WILL FURNISH ALL THE FACE AND ORNAMENTAL BRICK FOR THE ABOVE MANTEL AND HEARTH

ABBREVIATIONS.

A	No. 8	PHILADELPHIA & BOSTON FACE BRICK COM.
B	No. 9	
C	No. 104	
D	No. 100	
E	No. 113	
F	No. 5	
G	No. 7	
H	No. 108	
I	No. 11	

SUBMITTED BY ALBANIAN

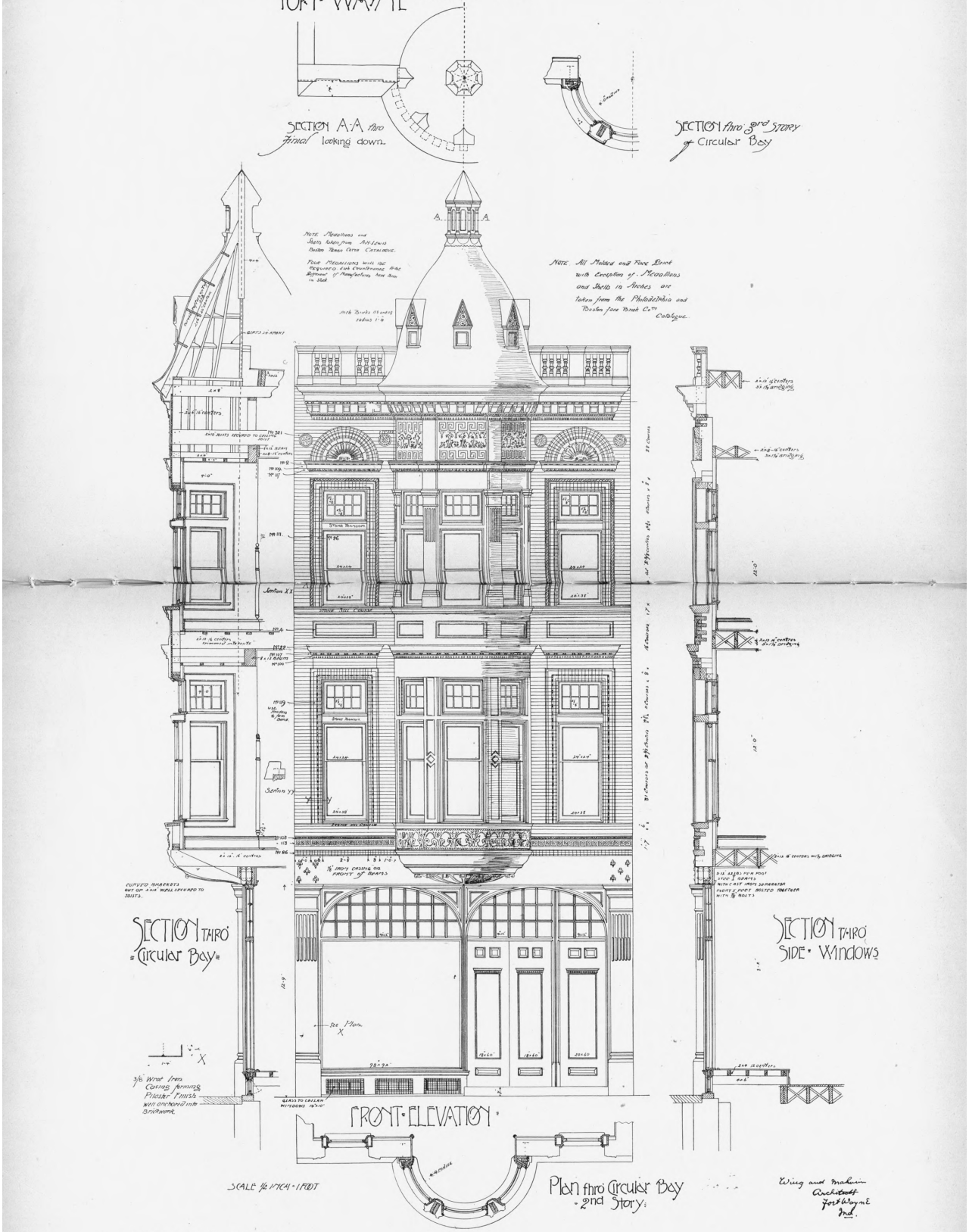
THIRD PRIZE.

JAMES C. GREEN, ST. LOUIS.

BRICKBUILDER COMPETITION, NO. 5.

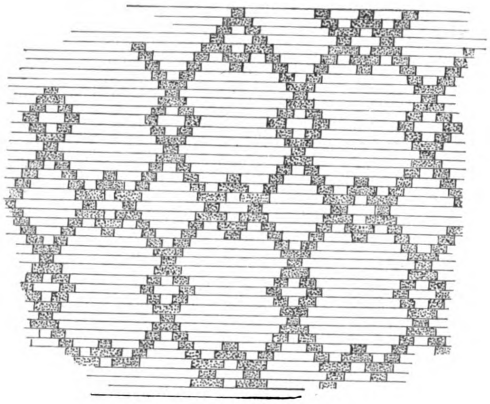
DESIGN FOR A BRICK FIREPLACE.

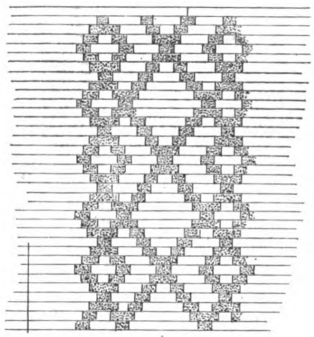
DESIGN for STORE to be erected on EAST Wayne Street FORT WAYNE Indiana

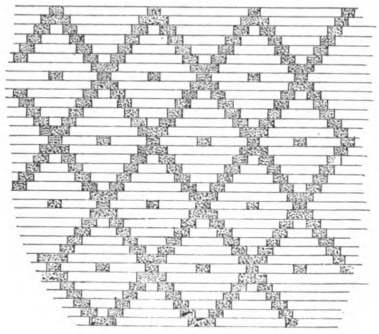


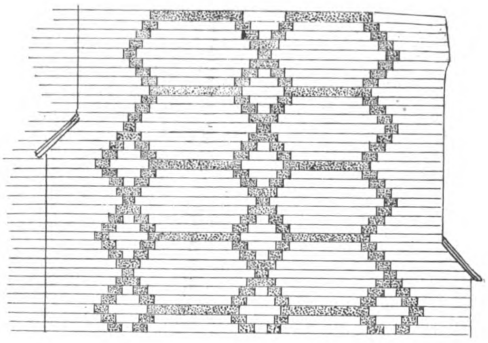
BUSINESS BUILDING AT FORT WAYNE, IND.

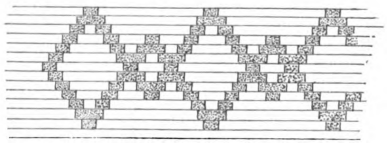
MESSRS. WING & MAHURIN, ARCHITECTS.

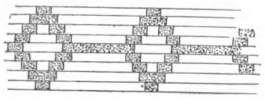








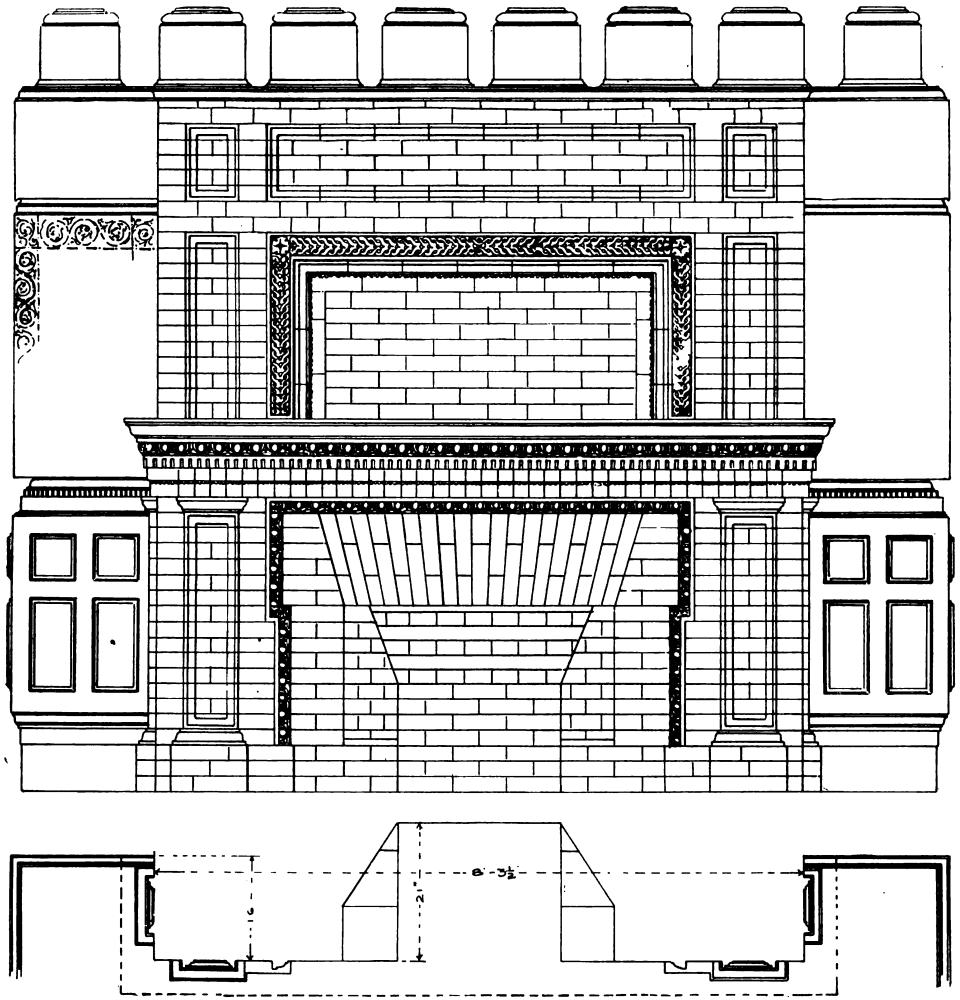


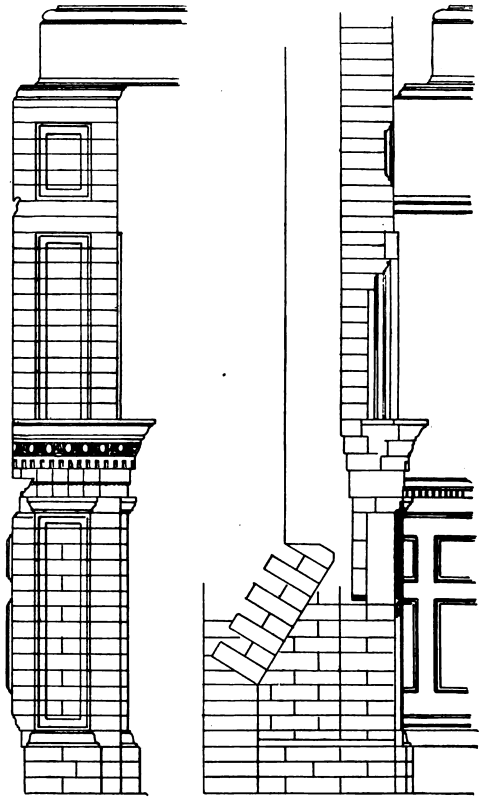


DIAPER WORK FROM SHIPLAKE COURT, ENGLAND.

MESSRS. ERNEST GEORGE & PETO, ARCHITECTS, LONDON.

See Supplement.





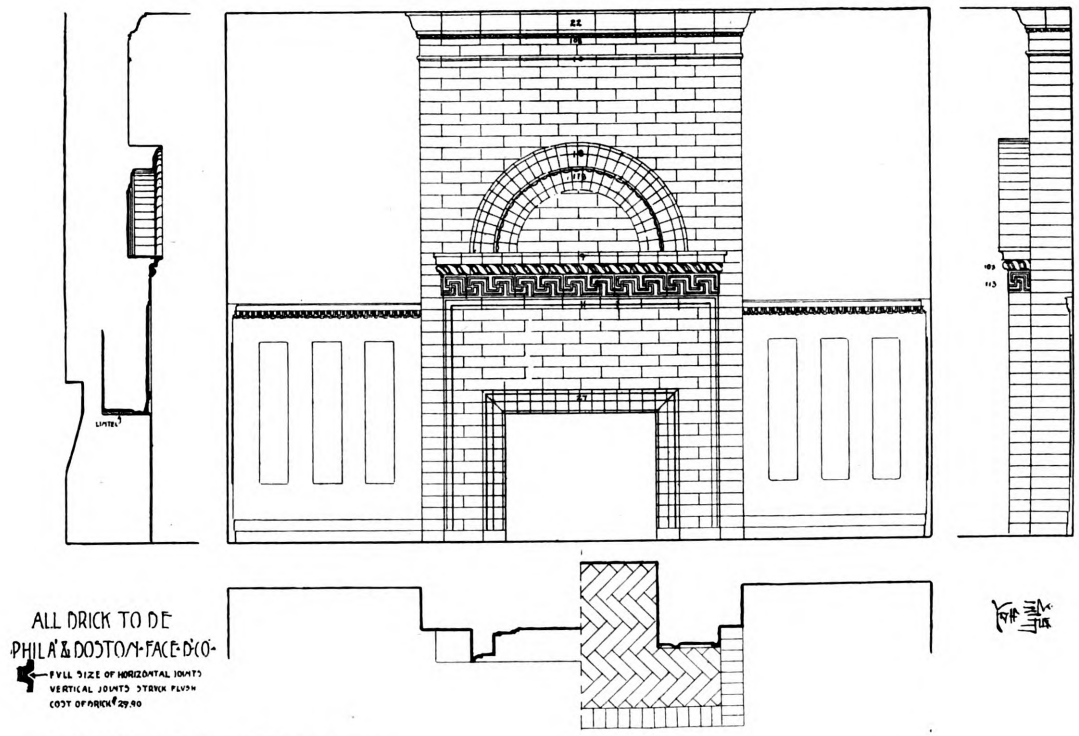
Bricks used Nos.
5-8 11-100-109-114-117-121
Cost for Face Brick $11 00.

FIFTH PRIZE.

ALBERT B. LAWYER, NEW YORK.

BRICKBUILDER COMPETITION, No. 5.

DESIGN FOR A BRICK FIREPLACE.

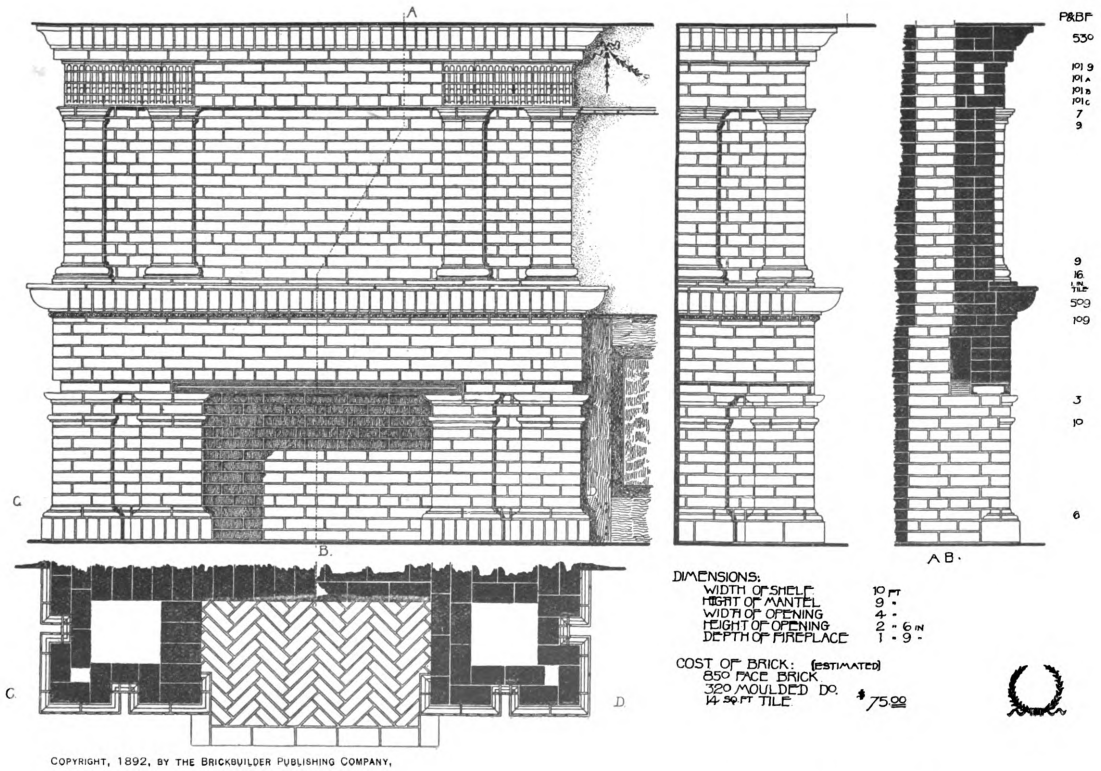


FOURTH PRIZE.

JAMES C. GREEN, ST. LOUIS.

BRICKBUILDER COMPETITION, No. 5.

DESIGN FOR A BRICK FIREPLACE.



H. G. FLETCHER, BOSTON, MASS.

prefer to build of brick than of lumber, if they could do so with the like results; that is, if they could build stylish buildings with but a slight increase in first cost. There is a large field here for the employment of capital and enterprise in the manufacture of repress and ornamental brick. Had we these goods we could sell more common brick; we could adopt your valuable suggestion in the June number of THE BRICKBUILDER and double our output in a few years.

JOHN ERVIN,
Secretary International Brick Company,
Bridgetown, Nova Scotia.

PREVENTION OF DAMP IN WALLS.

[The following, while applying directly to English construction, contains so much of interest to all American architects and builders that we have taken the liberty of republishing it from that exceedingly valuable South Kensington series, "Notes on Building Construction." Although this series is based upon English practice, the principles it lays down are broad and sound, and apply in general to building work the world over. It is published in four parts, each with an exhaustive index, adding to its value as a reference work. In this country copies can be obtained through any bookseller, or ordered direct from the importers, Bates, Kimball & Guild, of Boston, or the J. B. Lippincott Co., of Philadelphia. — *Ed.*]

The importance of keeping moisture out of walls as far as possible need hardly be dilated upon.

In addition to the great importance of a dry building for sanitary reasons, it is also most necessary for good construction. Dampness in the masonry soon communicates itself to the woodwork, and causes rot throughout the building, besides which, the masonry itself is not sound; the mortar, unless of good hydraulic lime or cement, does not set, and is always liable to the attacks of frost.

To give some idea of the quantity of water that the walls of an improperly protected building may contain, and of the evil effects caused by damp, the following remarks are quoted from an official report:[1]

"In England the common bricks absorb as much as a pint or pound of water. Supposing the external walls of an ordinary cottage to be one brick thick, and to consist of 12,000 bricks, they will be capable of holding 1,500 gallons, or 6 1-2 tons of water when saturated. To evaporate this amount of water would require nearly a ton of coal, well applied. The softer and more workable stones are of various degrees of absorbency, and are often more retentive of moisture than common brick. Professor Ansted states that the facility with which sandstone absorbs water is illustrated by the quantity it contains both in its ordinary state and when saturated. He states that even granite always contains a certain percentage of water, and in the dry state is rarely without a pint and a half in every cubic foot. Sandstone, however, even that deemed fit for building purposes, may contain half a gallon per cubic foot, and loose sand at least two gallons. When water presents itself in any part of such material, it readily diffuses itself by the power of capillary attraction, by which, it is observed on some walls in Paris, it ascends thirty-two feet from the foundations. Walls of such absorbent constructions are subject to rising wet by capillary attraction, as well as the driving wet of rain or storm. To guard against the driving wet on the coast, expensive external coverings, 'weather slates,' are used. But these do not stay the interior rising wet. This wet having to be evaporated lowers temperature. Damp walls or houses cause rheumatism, lower strength, and expose the system to other passing causes of disease."

It is a wise precaution to cover the whole surface of the ground under a dwelling with a layer of concrete or asphalt, in order to prevent the damp and bad air out of the ground from rising into the building.[2]

This precaution is, however, generally omitted because it involves expense; but measures to keep the walls dry are or should be adopted in nearly all buildings intended for occupation by human beings.

The walls of a building are liable to be charged with moisture:

1. By wet rising in them from the damp earth.
2. By rain falling upon the exterior of the walls.
3. By water from the roofs or leaking gutters soaking into the tops of the walls.

Of these evils the first may be prevented by the construction of dry areas or "air-drains," and by the introduction of damp-proof courses; the second may be counteracted by impervious outer coatings or by the use of hollow walls; and the third avoided by the use of projecting eaves with proper gutters, or where parapet walls are used, by an upper damp course.

Air-drains are narrow dry areas, nine inches or more in width, formed around such parts of the walls of a building as are below the ground.

They prevent the earth from resting against the walls and imparting to the masonry its moisture, which, rising by capillary attraction, might cause the evils already referred to.

The outer wall of the area should rise slightly above the surrounding ground, so as to prevent the water from the surface from entering the air-drain. Arrangements should be made for keeping the area clear of vermin, for ventilating it, and also for draining off any moisture that may accumulate at the bottom.

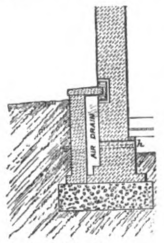


FIG. 1.

In the section, Fig. 1, is shown an air-drain twelve inches wide, having a rubble retaining wall, and being covered by flagstones built into the wall and weathered on the upper surface; of these, one here and there is removable in order to give access to the drain. The air-holes shown in the figure insure the thorough ventilation of the drain and of the space below the floor of the building.

There are several forms of air-drains; the width of the area is often much less than that shown in the figure, and sometimes is so reduced that the arrangement simply amounts to providing a hollow wall. In other examples the outer retaining wall is curved in plan, between the piers, being concave on the inside, by which additional strength is gained and thinner walls may be used. The area is frequently covered by a small quadrant arch turned against the wall, instead of by paving.

In some cases, to avoid the expense of air-drains, the outer surface of the portion of wall below ground is rendered with cement, asphalted, or covered with a layer of slates attached to the wall.

Substitutes for properly built air-drains may be cheaply formed by placing a flagstone in an inclined position against the outside of the wall to be protected.

Wide and open areas are much more expensive, but allow a freer circulation of air, exclude damp more thoroughly, and are, on the whole, superior to air-drains.

Horizontal Damp-proof Course. — Even where air-drains are provided, a damp-proof course should be inserted in all walls to prevent the moisture out of the soil from rising in the masonry.

The damp-proof course should be six inches or more above the level of the external ground, but under the wall plate carrying the floor-joists.

There are several forms in which a damp-proof course may be provided.

It may be of glazed pottery slabs built into the wall, as shown at D D in Fig. 2. The joints between the slabs must be left empty, or the damp will rise through them.[1]

A layer of tough asphalt, about ⅜ inch thick, is often used instead, as at A in Fig. 3.

In buildings finished with a parapet wall, a damp-proof course should be inserted just above the flashing of the gutter, so as to prevent the wet which falls upon the top of the parapet from soaking down into the woodwork of the roof and into the walls below.

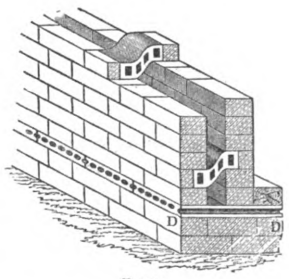


FIG. 2.

In some localities damp-proof courses are formed of asphalted felt, or with slates set in cement; these latter are rather liable to crack, and thin, impervious stones, or courses of Staffordshire bricks in cement, are better. Sheet lead has been used for the same purpose, and is most efficacious, but very expensive.

[1] Report on Dwellings in the Paris Exhibition, by Edwin Chadwick, Esq., C. B.
[2] This is enjoined by the Model By-Laws of the Local Government Board.

[1] To prevent wet which comes into the hollow space, through the outer portion of the wall, from finding its way along the top of the damp-proof course to the interior of the wall, a cement fillet may be run along the angle at the bottom of the hollow space between the top of the damp-proof course and the inner portion of the wall.

Arches over vaults, or cellars under footpaths, are frequently rendered all over the extrados with asphalt or cement to prevent the penetration of wet.

Vertical Damp-proof Course. — In addition to the precautions adopted to prevent damp out of the ground from rising in walls, it is necessary (especially when using inferior bricks or porous stones) to prevent moisture falling upon the outer face from penetrating to the interior of the wall.

The wet may be kept out of the interior of the wall by rendering the exterior surface with cement, covering it with slates fixed on battens, or with glazed tiles set in cement. Taylor's pottery facing bricks answer the same purpose.

Another plan patented by Mr. Taylor consists of overlapping slates placed vertically in the middle of the wall, the two portions of which are united by peculiar iron ties.

The Hygeian rock impervious wall-lining, patented by Mr. White of Abergavenny, consists of a vertical sheet of waterproof composition introduced into the thickness of the wall.

The wall is built up, two or three courses at a time, in two vertical slices, with about ½ inch opening between them, the inner parts of the horizontal joints next to this opening being left empty. The melted composition being run in, fills all the openings thus left, and not only prevents the penetration of moisture, but adds to the strength of the wall.

It is stated that a 9-inch wall built with the lining is stronger than an 18-inch wall built in the ordinary way.

This system may often be useful for parts of buildings in very damp places, but it must be remembered that walls perfectly impervious to air are, for sanitary reasons, undesirable for inhabited rooms.

Hollow Walls not only exclude the damp, but the layer of air they contain being a non-conductor of heat, tends to keep the building warm. Such walls are formed in two separate portions, standing vertically parallel to one another, and divided by a space of about 2 or 3 inches, sometimes 4½ inches.

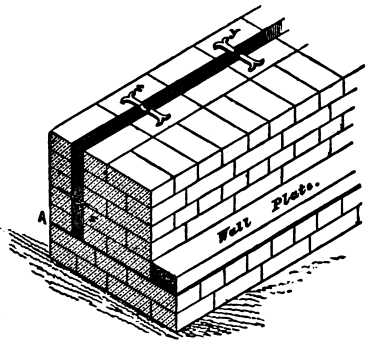


FIG. 3.

These two portions are generally united either by special bonding bricks, or by iron cramps. There are several ways of arranging the thickness of the portions of the wall and the consequent position of the air space.

In some cases the two portions are of equal thickness, the air space being in the centre.

Very frequently one of the portions is only 4½ inches thick, built in brick work in stretching bond; the other is of such thickness as may be necessary to give the whole stability.

In such a case the thin 4½ portion is sometimes placed on the outer, and sometimes on the inner side of the wall.

Hollow Walls with the thin portion inside. — In some cases, such for instance as when the wall has a stone face, the 4½-inch portion is necessarily on the inside, but this arrangement has many disadvantages.

In the first place, the bulk of the wall is still exposed to damp, and the moisture soaks in to within 7 or 8 inches of the interior of the building.

Again, if the wall has to carry a roof, expense is caused, as the span should be increased so as to bring the wall-plates on to the outer or substantial part of the wall, clear of the 4½-inch lining.

This may be avoided by bridging over the air space so as to make the wall solid at the top, which, however, renders it liable to damp in that part. There is an advantage in having the thick portion of the wall outside when deep reveals have to be formed for the door and window openings.

Hollow Walls with the thin portion outside. — If the 4½-inch portion is placed outside, the damp is at once intercepted by the air space, kept out of the greater portion of the wall, and at a considerable distance from the interior of the building.

The roof can be economically arranged so as to rest upon the interior thicker portion of the wall.

The stretching bond is, however, considered by some to be unsightly, unless made to appear like English or Flemish bond by using false headers; and, where the bricks are bad, the thin exterior portion, if liable to be attacked by frost, is in time destroyed.

Moreover, when the thin portion is outside, there is some difficulty in constructing deep reveals in a solid manner without their becoming a channel for damp across the opening.

Hollow Walls with Bonding Bricks. — Jenning's patent bonding bricks are made of vitrified pottery, and are of the shape shown in Fig. 2. These bricks are built in across the opening at horizontal intervals of about 2 feet 6 inches, and vertical intervals of about 9 inches to 12 inches. The bricks in the several courses are placed checker-wise, so that each is over the interval between two below.

The peculiar shape of the brick enables it to be built into the wall, so that the end in the front portion is a course lower than the end in the back portion of the wall. This prevents any moisture running along the surface of the bonding brick to the interior of the wall.

Precautions. — When building with these bricks it is advisable to cover them temporarily with a pipe swathed in hay bands, or by a narrow strip of wood, in order to prevent the falling mortar from lodging upon them. As the wall rises the strip is transferred in succession from each row of bonding bricks to cover the last built in.

Sizes. — The bent bonding bricks shown in Figs. 2 and 3 are made in four sizes, from 7½ inches to 13½ inches horizontal length between their ends.

Their length and shape are arranged so as to afford either a 3-inch or a 4½-inch cavity, and to enter the wall either 2¼ inches at both ends — 2¼ inches at one end and 4½ at the other — or 4½ inches at both ends.

The bonding bricks may extend right through the thin portion of the wall, or, if this is objectionable on account of appearance, their ends may be covered by bats, as shown in the figure.

Hollow Walls with Iron Ties and Cramps. — Ties of cast iron, dipped when hot in tar, are frequently used instead of bonding bricks, and have the advantage of not being liable to be broken if the wall should settle unequally. On the other hand, they are subject to decay by rust, and to expansion from the same cause, which may injure the wall.

The ties are about 8 inches long, ¾ inch wide by 1-10 inch thick; they are placed about 3 feet apart, horizontally, and with 9-inch vertical intervals between the rows.

Each tie is either bent or twisted in the middle so as to stop the passage of water along its surface, and hollow iron ties possessing great strength at struts have for some time been introduced.

Cast-iron cramps are made about ½ inch wide and 3-16 thick, and somewhat similar in form to the above.

The hollow wall is often arranged to begin on the damp-proof course, but it is better to continue the hollow for two or three courses lower, so that any wet falling into the cavity may be well below the damp course. A covering course of brickwork is placed on the top of the air space, which should have no communication with the outer air.

Some walls are built entirely of hollow bricks made for the purpose.

Stone walls are sometimes lined with 4½-inch brickwork on the inside, an air flue about 2 inches wide being left between the masonry and the brickwork.

Hollow Walls built with Common Bricks only. — In the absence of iron cramps or bonding bricks, hollow walls may be built with ordinary bricks placed on edge, after being dipped in boiling tar to make them as non-absorbent as possible. Every course is composed of alternate headers and stretchers, so arranged that each header comes immediately over the centre of a stretcher in the course below. The wall thus formed consists of two portions, each 3 inches thick, separated by a 3-inch space.

Another plan is to lay the bricks as in ordinary English bond, leaving a space of about 2½ inches between the stretchers in the front and back. This makes the wall (4½ plus 2½ plus 4½) = 11½ inches thick; and the headers are, therefore, too short to reach from face to back; the deficiency is made up by inserting bats at the ends of the headers.

These and other plans adopted for building hollow walls with ordinary bricks are defective in strength as compared with the walls

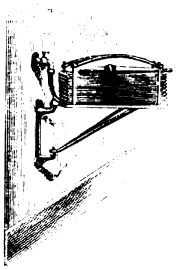
constructed with special bonds or cramps, and, moreover, the common bricks being porous, conduct moisture to the interior of the wall and defeat the object aimed at in making it hollow.

A better plan in the absence of the special bonding bricks or ties is to unite the portions of the wall by pieces of slate slab, or of dense impervious stone used in the same way as the iron ties.

Openings in Hollow Walls. — Where the lintels of doors and windows occur in a wall with a 4½-inch exterior portion, the following arrangement may be adopted to prevent the wet which may enter the air space from dropping upon the window or door frame:

Just above the window or door head a piece of sheet lead is built in on the inner side of the 4½-inch exterior wall. This lead may be 4¾ inches wide, 2 inches being built into the 4½-inch wall, 1¾ inch projecting into the air space, and the remaining inch turned up so as to form a sort of gutter, which should be carried about 2 inches farther than the ends of the lintel each way, so as to lead the water clear of the door or window frame.

FIRE PROTECTION FOR DWELLINGS.



In almost every large office or mercantile building one notices, placed in a prominent position on each floor, a swinging hose rack in which the hose carefully folded, with nozzle on top, lies ready for use at a moment's notice. In operation it is exceedingly simple. One has merely to grasp the nozzle and rush to where the fire is, and the rack, swinging around in the same direction, allows the hose to run off without any chance of tangling or kinking. Even in so thoroughly fireproof a building as the Ames Building in this city, the architects have added a standpipe with one of these hose racks on each floor, ready for any incipient blaze of woodwork or furniture. The manufacturer, Mr. J. C. N. Guibert, of New York, has recently begun the manufacture of a small rack of which we are able to give an illustration. For use in houses and small buildings, and wherever water under pressure is available, no property owner should hesitate to provide this inexpensive apparatus, this "ounce of prevention" one might say, it is so immediately effective in case of need.

BRICK BUILDING IN NORTH GERMANY.

The scarcity of stone in the northeast parts of Germany caused the partial or total adoption of brick for architectural purposes. Where brick was partially employed and stone was reserved for the decorative portions, as in parts of Poland and in Silesia, the style of the structures was not modified by the use of brick; but where it was entirely employed, as in the north of Brandenburg and in Pomerania, it produced considerable changes. The earliest specimens of brick buildings hitherto noticed in the North of Germany are of the twelfth century. Such are the cathedral of Ratzeburg, in the Duchy of Lauenburg, the cathedral of Lübeck, the conventual church of Jerichow near the Elbe, portions of the Marien Kirche at Bergen, Alten Kirche in the island of Rugen, the church at Gadebusch in Mecklenburg and the cathedral of Brandenburg. Examples of the thirteenth century are to be found at Cammin, in Pomerania, in the choir of the church of St. Ansgar at Bremen, the Dominican convents at Cracow and Breslau, part of the Rathhaus at Lübeck and the Kloster Kirche at Berlin. Towards the end of the thirteenth century several fine churches were erected, such as the Marien Kirche at Lübeck and St. Nicholas at Stralsund. The close of this century was the period in which the finest specimens of the brick buildings were executed, and the style was most fully developed. The brick buildings resemble the contemporary ones of stone in the North of Germany, in the great use of gables and their exaggerated size and decoration, the strange form of the towers, the immense roofs covering under one pich both nave and aisles, the slenderness of the piers and the poverty of effect in the interior; but they differ from them in the rarity of flying buttresses and the sparing use of buttresses of any kind, the general squareness of forms, the extreme plainness of the window tracery, in the absence of shafts, pinnacles, statues, large mouldings and bands of foliage, the constant repetitions of the smaller mouldings and ornaments, and the strong contrast produced by the mixture of glazed and unglazed bricks. The later buildings show the extension of these peculiarities, as the church of St. Mary at Wismar, the Jacobi Kirche at Stralsund, St. Nicholas at Wismar, and St. Katherine at Brandenburg. The civic buildings of the fourteenth and fifteenth centuries are very effective, such as the town halls of Lübeck, Stralsund, and Rostock. Some of the walls and gate-towers are remarkable, as the Muhlen Thor at Brandenburg, and the Holstein Thor and Burg Thor at Lübeck. Some of the private dwelling-houses of brick are very rich, and their great gables are much ornamented; good specimens may be found at Anclam, Wismar, Stralsund, and Greifswalde. The later period of Gothic architecture, from 1450 to 1550, is represented by fewer buildings, owing to the decline in prosperity of the Hanse towns, and the buildings then raised are inferior and poor in detail. Some of the civic buildings, however, are curiously ornamented, such as the Town Hall at Hanover, dated 1455, and the Rathhaus at Zerbst in Anhalt. Towards 1550 the influence of the Renaissance style began to be felt, and specimens of it may be seen in the Fürstenhof at Wismar, the Schloss at Schwerin and that at Gadebusch.

ENGLISH AND ITALIAN BRICKWORK.

Early English brickwork is now rare. Little Wenham Hall, Suffolk, of the latter part of the 13th century, shows different sizes of bricks; these are mixed with stone and flint in parts. The bricks are of Flemish shape, though some resemble Roman bricks or tiles, and the color varies. We must turn to the Eastern Counties for examples of English brickwork. In many of these flint is introduced in the form of panels, and this kind of walling is known as "flush work." Nearly every important church is of this mixture of brick or stone and flint. Layer Marney Hall, Essex, is a noted example of brickwork. The great gate-house of three stories, flanked by octagonal turrets, with battlements and parapets, and window mullions, exhibit an advanced stage of brickmaking and workmanship. Respecting the size of English bricks, those at Little Wenham Hall measure 9¾ inches in length by 4¾ inches wide, and 2¼ inches thick. Those made in Edward II.'s time measure 10 and 12 inches long by 5 and 6 inches wide. The "great brick," of 1734, measured 12 inches long, 6 inches wide, and 3 inches thick. Portions of Hampton Court Palace show some beautiful examples of English brickwork, to which the attention of the student may be directed.

The late Mr. Street, a great authority upon Italian brickwork, points out in his work on "Brick and Marble Architecture" to what a large extent red brick is used with stone. Italian bricks are rather larger than ours, but not of better quality; the joints are wide, generally not less than half an inch. The bricks used for windows, doorways, and other ornamental features are of finer quality and moulding.

Those who know Italian examples of brick arches and tracery are aware that the cusping of arches is of brick, set in the same radiating lines as the arch, and cut and rubbed to the outline required. He says, "In nearly all cases where brick is used for tracery, it is in the shape of plate tracery. The tympanum of the arch is filled in with a mass of brickwork, through which are pierced the arches over the several lights of the window, and these are supported on marble or stone shafts, with carved capitals instead of monials; and above these sometimes, as in the windows of St. Andrea, Mantua, are three cusped circles, sometimes only one; or else, as in the cathedral of Cremona, the plain brick tympanum is relieved by the introduction of a panel of terra-cotta bearing the cross on a shield, whilst round its outer circumference delicately treated though large cusping defines the outline of the arch." Outside the arch sometimes a red brick label 2½ inches wide is introduced. In Mantua and Asti these narrow bricks are set between rings of brick and stone voussoirs. — *The Building News.*

FOOTINGS FOR BRICK WALLS.

No part of a wall requires more careful construction than the foundation, for the obvious reason that the stability of the whole wall depends upon it. Foundations are too frequently neglected or are improperly constructed, and too often they are built in such a way as to be altogether too costly, considering the work they have to do.

The subject of foundations may conveniently be divided into two parts: first, the treatment of the soil upon which the wall is to rest; and, second, the method of constructing the base of the wall, or, as it is generally termed, the "footings." Although it is the second part

of the subject that it is intended to give consideration in this paper, a few words words may be said as to the first.

The best soil to build upon is probably a uniform and level bed of hard gravel, as it gives ample support, while affording natural draining qualities. Solid rock foundations are but rarely found, and, as a rule, means must be taken for the provision of an artificial foundation. Exactly the plan to be followed will, of course, depend upon the nature of the soil. When it is clay or fairly firm earth a bed of concrete will usually be sufficient. When the soil is very weak, such as is often found in the immediate vicinity of water, piling may be necessary, while a bed of sand upon a shifting soil may be successfully treated by driving in sheet piles close together around the site, thus forming a description of box which confines the loose soil.

Coming now to a consideration of the footings of a wall, the first thing to carefully bear in mind is the question of the pressure upon the soil. The wider the footings of a wall the greater is the distribution of the weight, and the smaller the pressure on any part of the soil. To make this clear, let us suppose that a single square foot of the base of a wall bears with a pressure on the ground of one ton. If the base of the wall is widened and is built so that two square feet bear upon the ground, it is clear that there is only a pressure of one half a ton on each square foot of soil instead of one ton as in the first case. Carrying this principle a little farther it will be seen that within reasonable limits the weight placed upon the soil may be reduced as low as one wishes by the simple means of increasing the width of the base of the wall.

But this naturally depends upon the footings of the wall being properly constructed. Footings are usually constructed by increasing the width of each course by half a brick, one quarter or about two inches on each side. Now it will be clear on a little consideration that, in order to equally distribute the weight over the whole surface of the ground upon which the bottom course of footings rests, it will be necessary to provide against the offsets tearing away, if such an expression may be used, from the body of the wall. In other words, the construction must be such that the weight of the main wall does not bear through and break away from the projecting footings and bear directly on the ground, independent of them. To make such provision, two things are necessary: first, to make the offsets amply strong enough; and, second, to tie the offsets into the body of the wall. The size of the offsets will depend upon the weight to be placed upon the wall, and although single offsets of a quarter of a brick in width are most frequently used, they are by no means adequate where very heavy weights are to be placed upon the wall. In such cases the offsets should not exceed one and a quarter inches and, when the weight is an exceptionally heavy one, should always be two or even three courses deep. In the construction of footings that are to support piers or columns, these two or three course offsets are especially desirable. The piers used in the construction of the New York elevated railroad are built in this way, and the great weight supported by the steel piers that are only little more than a foot square is distributed over quite a large area by the wide footings upon which they rest.

The second desideratum in building footings is a simple one, and yet it is not carried out in perhaps one case in a hundred. This is that every brick, where possible, should be laid a header, and that when a stretcher is necessary in consequence of the width of the wall it shall be placed as near the centre of the wall as possible. It is difficult to understand why bricklayers will persist in laying bricks in footings stretchers when headers answer so much better, and, to all intents and purposes, are as easily laid. Perhaps it is because they are so thoroughly demoralized, from a mechanical point of view, in laying them stretchers in the main walls that they cannot get out of it when constructing the footings.

ARTHUR SEYMOUR JENNINGS.

THE SUPPLEMENT.

With this number a jump is made in our series of supplements, from mediæval Italy to modern England. One reason lies first in the fact that we have recently received from Messrs. Ernest George & Peto, of London, scale drawings of some of their recent brickwork, together with excellent photographs of the completed work; and second, in the fact that our series of illustrated articles on "Old English Brickwork" is almost ready, and during the months that these will be published, the opportunity of using the supplement to add to their illustration cannot be lost. Therefore, while we intend returning to Italian work, we shall, for the present, devote the supplements to England.

The present one gives one view of Shiplake Court, the residence of W. H. C. Harrison, designed by Messrs. Ernest George & Peto; and in plate 62 we publish some of the architects' details for the diaper work which is used all over the exterior of this building. Later, a different view will be given, with other details to scale. Apropos of our editorial remarks on the brick walls, we wish to call attention to the wall shown in the supplement, as partly illustrative of our meaning.

In illustration of "Old English Brickwork" some very fine photographic supplements will be published that will greatly add to the value and interest of the articles.

THE BRICKBUILDER COMPETITIONS.

RULES: All drawings must be sent in marked with some motto or device, and accompanied by a sealed envelope marked with the same, containing the full address of the competitor. The designs are judged by a committee of well-known architects, solely upon their merits, the names of the designers remaining unknown until the award is made, when the sealed envelopes corresponding to the devices on the designs are opened. To protect the interests of our advertising patrons it is stipulated that no ornamental bricks not found in their catalogues shall be used. This is really no restriction, for practically all of the leading manufacturers will be found represented in The BRICKBUILDER. To encourage the study of effective use of the commoner materials, of two designs equally good, preference will be given that showing a skilful use of ordinary bricks to secure ornamental effect.

COMPETITION NO. 8.

A BRICK GABLE.

Programme. It is required to design a brick gable, twenty feet wide, with gutters four feet above the floor line of the attic room. The slope of the roof will be fifty degrees. A window or group of windows will light the attic room. Construction and ornamental work is to be entirely of brick, and the simpler forms are advised. In the selection of ornamental bricks competitors must observe the general conditions printed regularly at the head of this department. Drawings to a scale of ½ an inch to the foot, made in black ink, on smooth paper, must be delivered at the office of THE BRICKBUILDER, carriage paid, on or before Dec. 12, 1892. A well-rendered perspective sketch on a separate piece of paper may accompany the design, but it is not required. For the three best designs prizes of $5.00 each will be awarded; for the three second best designs prizes of $2.50 each will be awarded. The publishers reserve the right to publish any or all of the designs submitted, whether awarded prizes or not.

The publication of the designs in competitions No. 4 and 6 has been postponed, for the reason that No. 5 was much more successful, in point of number of designs, than either of the others, and as so many more competitors are interested, we have decided to let it take precedence and publish the chimney-tops and windows in the next issue.

COMPETITION NO. 5.

The regular announcement of prizes and awards will be made in the next number, when the other designs will be published. In this number the first, second, third, fourth, and two of the fifth prize designs are published.

THE ILLUSTRATIONS.

Plate 57. Design for Fireplace, first prize by J. T. Maclaren, Philadelphia.

Plate 58. Design for Fireplace, second prize by Gilbert F. Crump, Albany, N. Y.

Plate 59. Design for Fireplace, third prize by James C. Green, St. Louis.

Plates 60, 61. Store Building, Messrs. Wing & Mahurin, architects, Fort Wayne, Ind.

Plate 62. Diaper Patterns, Shiplake Court, Messrs. Ernest George & Peto, architects, London, England.

Plate 63. Design for Fireplace, fifth prize by Albert B. Lawyer, New York City.

Plate 64. Design for Fireplace, fourth prize by James C. Green, St. Louis.

Design for Fireplace, fifth prize by H. G. Fletcher, Somerville, Mass.

CHURCH TOWER, HAMPTON COURT PALACE.

The Brickbuilder.

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It is gratifying to receive such hearty and appreciative commendations as is given to THE BRICKBUILDER in the *Architectural Era* of October, especially when that commendation comes from a journal as careful and discriminating as that which Prof. Osborne, of Cornell, so well conducts.

That the reforms we advocate with regard to brick architecture and brick building are so constantly commended in various parts of the country, seems to us to indicate that the improvements we look forward to will rapidly prevail. The example is being set everywhere by our foremost architects, and others will not be slow in attempting to follow where they lead. But in making that attempt, failure is certain, unless the principles which governed in the designing of our best brick buildings are thoroughly understood, and unless the motive is a desire for real excellence for its own sake, and not a mere desire for display or the following of fashion. The underlying principles of good brick design are, of course, essentially the same as those which must govern all good design; but the application of these principles differs with the material to be used. Nor need the strict application of the best principles of design produce any monotony, or lead to the sacrifice of any of that piquant variety which unfortunately seems, by most of our people, to be considered of greater importance than real excellence. What a variety the application of the same principles may produce, we can see by a comparison of the excellent brick styles of such countries as Lombardy, Normandy, Holland, North Germany, and England. What a difference between the many colored brick designs of the Romanesque period in Lombardy, with their quiet succession of round-arched arcades, or the work of the early Renaissance of the same district, with terra-cotta and a profusion of moulded ornament; or the tourelles and flat-arched windows and horizontal, plain, brick strings of Normandy manor houses, or the high-peaked, stepped gables of Holland, or the cosey domesticity of English halls, with their tall, grouped chimneys, their pattern work and rubbed mouldings. The variety seems endless, yet in each case it is but the application, under different conditions and in different ways, of the same principles and the same material. We may go on, and, taking the hints which the architectural wealth of Europe affords, may produce still further variety under the changed conditions under which we live. But if our work is to have the excellence of the old work of Normandy or Lombardy, of Holland or England, it must follow the same principles which were followed unconsciously by those builders of old, — the principle of frank recognition of the characteristic qualities of the material in which we work, and of the conditions with which we have to deal, using them as a motive for our designs, using them as a musician uses the notes in his music. For the laws of good design in architecture are as inexorable as the laws of harmony, if we could but see it.

The London *Builder* of Oct. 8 publishes a very admirable series of drawings for St. Saviour's Church at Folkestone, now being built from the design of Messrs. Somers Clarke and J. T. Micklethwaite, architects, which it is interesting to compare with Mr. Van Straaten's design for a brick church, published in our May number. Messrs. Clarke and Micklethwaite's design is for a church of Kentish rag stone with brick dressings, the window jambs and tracery being of terra-cotta. The design, however, is equally suited to execution in rough, common brick (in place of the rag stone) and face brick trimmings, and is an admirable example of the proper use of brick in Gothic design. The construction and design of the window tracery are especially interesting and instructive. With but slight modifications, which we think would hardly injure the design, such tracery as this could be just as well executed in brick as in terra-cotta. All the pieces are small, and the design of the window is essentially a brick design, — a design which makes the most of the essential peculiarities and characteristics of brickwork, and uses them as a motive, — a design, in short, which, while admirable in brickwork, would be defective if executed in stone. We regret, however, the form of the arched openings. A full pointed arch could have been just as well used without otherwise affecting or altering the design. The segmental pointed arch is never beautiful, and should be used only when the exigencies of the case clearly demand it, if indeed they ever do.

The manner in which the brick trimmings are contrasted with the rag stone on the exterior is very decorative. A similar effect, as we have already suggested, could be produced by using two kinds, or two colors, of brick.

We regret that in the interior the brickwork should be covered with plaster. A much more dignified and satisfactory effect can be obtained, in the interior of such a building as a church, by frankly exposing the brick and using it as a means of obtaining decorative effect. And this, we think, is clearly shown by the sectional drawing which shows the great interior pier arches, part in the brick, part with their plaster covering. Moreover, the brick, constituting the very body of the wall, is more permanent and durable than a plaster coating can ever be.

The bonding of the pier arches, which are diamond shape in plan, is interesting and ingenious. The exterior brickwork is laid in English bond throughout, and (as always in England) in every alternate course. *The Builder* publishes a perspective of exterior and interior, a side elevation, detailed elevation, and sections of the important parts, and a careful drawing showing the construction of the window tracery, in which the forms of the bricks and the manner of bonding are very instructive. The whole design is one of the most suggestive brick designs we have seen for some time. The church is thus described: —

"This church, when complete, will consist of a nave of four bays, with north and south aisles, and a large western tower opening into it; of a chancel of two bays, with north and south aisles, that on the south being used as a side chapel, and on the north as an organ place. The sacristy and choir-vestry

adjoin the organ place. The chancel is 39 feet long inside; the nave and tower 97 feet long. The width of the nave and chancel, which have a roof running through continuously from east to west, is 26 feet 6 inches; each aisle is 18 feet wide, and the total internal width is 67 feet. To the wall plate there is a height of 30 feet from the nave floor, and to the ridge of the pointed barrel-ceiling is 43 feet. Over the choir-vestry is a blowing-room for the organ.

"The church stands on clay and is in a very exposed position. The sea air soon eats into stonework. The outside walls of the church are, therefore, built hollow, with an outer skin of Kentish rag with brick dressings and an inner skin of brick, the two being tied together with slabs of paving-stone. The dressings are of brick. The window-jambs and tracery are of terra-cotta made by Messrs. Doulton. The object the architects have had in view in designing the window has been to treat terra-cotta as what it really is, — superior brick, and not sham stone. The pieces are all small, and range in color, jointing, etc., with the adjoining brickwork.

"The church is built inside of hard rough brick to receive plaster. The piers will be decorated with sgraffito, as will be the spandrels above the arches. The arches themselves will have mouldings in plaster, treated flatly and to suit the material, and in no way to imitate stone. The inner ceiling of the nave and chancel, which takes the form of a pointed barrel-roof, is in plaster with wood ribs. The aisles, which have flat roofs, are covered with Fawcett's fireproof system of hollow tube construction, laid on the outer side with Claridge's asphalte. The chancel is paved with squares of black and white marble. To isolate this floor from the damp it is laid on Fawcett's fire-clay tubes. Wall panelling will be carried round the church, and the bases of the piers are also to be similarly encased."

The architects have certainly carried out most successfully their intention "to treat terra-cotta as what it really is,— superior brick, and not sham stone," and are greatly to be commended for so doing.

English architects have been too apt to treat terra-cotta exactly as if it were stone, so that, for instance, a photograph gives the impression of a stone, not of a terra-cotta, building. Terra-cotta used in this way is used at a disadvantage. It cannot compete with stone on the stone's own ground, and yet it can be made to rival or even surpass stone in richness and beauty of effect (as it does in durability), when used so as to make the most of its characteristic qualities. Too often terra-cotta is treated as if it had more in common with stone than with brick.

It is surprising, indeed, how little the true nature of terra-cotta is understood. The difference between terra-cotta and brick lies solely in the fact that the terra-cotta is moulded or modelled by hand or formed under but slight pressure (whereas bricks are made under more or less great pressure), and that a much finer quality of clay is used in making terra-cotta than in making most bricks. Having received but slight pressure in the making, terra-cotta is capable of bearing comparatively slight pressure in place in the building, and therefore is properly used only in the more purely ornamental features. Sometimes large pieces of burnt clay of the finer kinds formed under great pressure are called terra-cotta, but they are really a fine kind of brick. Terra-cotta is best made in small or thin pieces on account of the shrinkage of the material in the burning, and the best effects in its use are also obtained by using it in small, not large, pieces. It is essentially plastic in its nature, — for it is but the modelled clay burnt, — and this should never be lost sight of in its use. To obtain the best effects in the richer decorative parts, especially in figure work, it should not be cast, but the actual clay model, as it comes from the artist's hands, should be burnt. Another characteristic which is of great decorative value, is the slightly different color which the different pieces take in the burning. And yet this interesting and beautiful result of the nature of its manufacture is often deliberately thrown away by streaking it over with a thin coating which gives it a flat, even color, generally of very ugly shade. If designers and manufacturers would only consider the essential character of the material they are using, such mistakes as this would not be made.

These essential characteristics of terra-cotta — let our manufacturers remember — are qualities to be proud of, to make the most of; not defects to be ashamed of and disguise, as if, after all, they were a little bit ashamed of their terra-cotta, and down in their hearts wished it were stone or anything but what it is. Terra-cotta and brick, we repeat, are materials of which our clay workers ought to be proud, and whose essential characteristics they should try to emphasize. Let them not, by disguising these characteristics, show that after all they do not believe what they say, when they boast that they are working in the best material there is.

We wish that every worker could appreciate the beauty of the material he handles, so that every man who moulds the clay, every bricklayer who builds a wall, should give his work the grace which can only come from the sentiment of beauty; so that he would take pleasure in giving the most graceful line to his moulding, and select his bricks so that their contrast of color should be most attractive. Beautiful work we can have only from those who take pleasure in their work.

We quote below a portion of a lecture recently delivered by Prof. T. Roger Smith at University College, London, in which he shows how the humblest craftsmen may really be artists if only they bring the artistic spirit, the love of beauty for its own sake, to their work. His remarks apply as much to the bricklayer and modeller as to the potter or smith whom he mentions.

"An art has been defined as 'the power of doing something not taught by nature and instinct.' Obviously, no natural gift, no skill gained unconsciously and in a natural way, is an art. To take a very simple illustration, riding and swimming are often spoken of as arts because we all acquire the power consciously and laboriously — not so walking or running, which may be said to be natural. 'Art is not nature.' The word 'arts' in the plural has an extremely extended significance, and may be used to cover all the kinds of learning and knowledge that are called liberal pursuits. The word 'art,' on the other hand, has often a narrow meaning, and is limited to the sort of skill which is directed towards objects of beauty. Art in this sense is a word which has been of late years on every one's tongue. More correctly, this sort of art is called fine art, but we usually now refer to painting, sculpture, music, architecture, and the related pursuits as pre-eminently the arts. This, however, is not strictly accurate. When we talk of an art it may or may not imply the possession and use of learning and knowledge, and it may or may not imply the exercise of trained and cultivated taste and the pursuit of beauty; but it always means a skill that does not come by nature. We talk of the art of the potter, the weaver, the navigator, the engraver, and, rising to a higher plane, we recognize the art of surgery, the art of war, the art of advocacy; but when what is the prime mover is no longer skill, but either learning, experience, money, or passion, the pursuit ceases to be thought of as an art. We do not, for example, talk of the art of a student, or an agriculturist, or a merchant, or a politician, although each of these must develop some skill in the exercise of other powers.

"Though there be a distinction between an art as thus described

and a fine art demanding cultivated taste as well as skill, the relation between the two is still very intimate; the links, for example, which connect the art of the sculptor with that of the jeweller, or even the potter, are close ones. There must be the same highly trained manual skill, and the same intimate knowledge of the materials used. The same clear and definite perception of the aim to be attained is needed for success in either. In each of the two industrial arts I have named, pottery and the goldsmith's craft, the production of objects of beauty is also an aim of the artificer, and if in addition the pursuits of the sculptor be of a higher, more arduous, and more intellectual quality, that difference is more in degree than in kind. There is, of course, between most of what are sometimes called the industrial arts, taken as a whole, and the fine arts, a difference which is conspicuous enough, but it is not always recognized that the whole of the arts are connected together to a remarkable degree by the fact that trained skill is in each case indispensable to those who would pursue them, and that there is not often a hard-and-fast boundary line distinguishing the one from the other.

"He that pursues an industrial art is called an artisan; he that pursues a fine art is called an artist; but many an artisan is an artist as well. The smith who hammers out a bit of red-hot iron into a horseshoe, and replaces the one your horse has cast, is, perhaps, only an artisan. Yet, while you wait and watch him, you are filled with admiration at the deftness, speed, and accuracy with which the work is done. Perhaps the same man can beat out for you a finial of wrought-iron round which he twines the vine leaf or the olive, and into which he infuses grace, beauty, charm. That man is then the artist, but his manual skill is an essential, integral part of his equipment for his art, although the taste, the feeling for beauty, and the knowledge of how to impart beauty to what was an hour ago a dull, inert mass of cold iron, is the highest development of his qualification; useless, however, without the other homelier power, and in some sort, as I take it, rather a development of it than a distinct gift."

TO CONTRACTORS AND BUILDERS.

To those builders to whom this number of THE BRICKBUILDER shall come as a sample copy we request their kind consideration of its merits as a business help.

There are a number of very meritorious periodicals devoted to elevations and details of frame buildings, but there seems to be a demand for a periodical furnishing details of the brickwork that makes a part of almost every building.

Such a periodical THE BRICKBUILDER aims to be.

For instance, this number contains a fine selection of brick fireplaces, wholly new and original, with details so complete that a master mason can build any one of them directly from the plates of the paper, also designs of chimney-tops. The number following will contain some fine elevations and details of buildings by prominent architects, also designs of arched windows. The April number contains designs of two-story store fronts. The May number was largely devoted to the elevations and details of a brick church, designed expressly for our paper by Mr. J. A. Van Straaten, Jr., of Boston, and which has received high praise for excellence from some of the leading architects of the country. The July number contained forty-five original designs of brick cornices, and the August number several designs of brick fireplaces and the elevations and details of a twenty-foot front brick store building at Fort Wayne, Ind., designed by Messrs. Wing & Mahurin.

In addition to these extremely practical features we have been favored by many of the prominent architects of the country with elevations and details of brick buildings, designed by them, which have never before been published, and we have the promise from a large number of others that when they have any distinctively brickwork ready for publication, it will be contributed to our plate department.

During the year we shall insert twelve supplements, being photographic reproductions of famous brick buildings, mostly of foreign countries.

We hope you will be favorably impressed with THE BRICKBUILDER, and we respectfully solicit your subscription. The price is $2.50 a year. Your local checks will be accepted at par.

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THE BRICKBUILDER PUBLISHING CO.

BRICKS AND JOINTS IN BRICKWORK.

From *Building News*.

There is no constituent part of a building about which so much might be written as of a brick; and what is of greater importance from a practical point of view, there is no part less susceptible to disintegrating atmospheric and other influences, and therefore so durable as a well-burnt brick, an example of which — if we may adduce one so far fetched — is that of Hillah, a modern settlement on the west bank of the Euphrates, built, as we are informed by a paper on "Recent Assyrian Research," read before the Philosophical Society of Great Britain, of the excavated bricks and terra-cottas which have been thrown up in the comparatively recent explorations of the ruins of Babylon, situated on the opposite side of the river. But we are not wanting in examples nearer home —

> "Those bricky towers
> The which on Thames' broad, aged back to ride,
> Where now the studious lawyers have their bowers,
> Where whilom wont the Templar Knights to bide,
> Till they decayed through pride."

And, later still, the 16th century or Tudor brickwork of Hampton Court Palace, with its well-proportioned niche heads of elliptical plan and semicircular elevation; the Layer Marney Tower and churches of Essex, and the Gray's Inn Hall, Holborn, lately denuded in part of its coat of daub or stucco, revealing the warm, deep — and in some portions brindled — color of 16th-century bricks, most probably produced by the fierce heat of wood-burning, and which are likely to outlast the bricks of more modern manufacture employed in the restoration of the exterior wall facings.

These remarks apply more particularly to the northwest portion of the building on either side of the archway approached from Gray's Inn, not the least pleasing feature of the old facing-bricks of which was their uniformity of size and shape, with a regular thickness of bed and cross joints, for which we look in vain on many of our buildings of more modern erection. The "closures" or quarter-bricks in the heading courses next the window reveals bear evidence, by their regularity of size, of having been cut to a gauge for the purpose of keeping the perpends in the heading courses. This was a sample of the work done when the general contractor or quondam builder's clerk did not obtain. The face-joints as originally struck and trowel-cut are unfortunately lost, as they had been hacked to form a key for the stucco coating, now removed, and what remained of the old face-joints was therefore necessarily hacked out, and has been reformed by that shoddy process known in the trade as "pointing."

The writer would here appeal to all architects, in the interest of good work and the production of skilled workmanship, to insist on the face brickwork being trowel-struck and cut during the erection of the work, except in winter months, when sharp frosts are likely to occur, when the joints should be raked out at least half an inch deep, and square with the face, laying bare the edges of the bricks in the full depth of the raking out.

The subjoined are some of the reasons for advocating the striking and cutting of the joints during the erection of the building:

Good mortar must be used for laying the face bricks, or a good joint cannot be produced. The face bricks must be wetted before laying them during the dry months, or the moisture will be taken up from the mortar by the dry bricks to such a degree as to make it impossible to properly strike the joint. The face bricks cannot be tampered with by color or copperas, and are, therefore, likely to be of a better class than for work intended for pointing.

The joints are more durable, as they form one body with the mortar of the wall instead of a veneering, as in the case of pointing. The joints, if properly trowel-struck and cut, exclude the weather more effectually than if pointed, for the reason that the top and bottom edges in pointing are cut off with a "Frenchman" (*i. e.*, a table-knife filed to a point and turned up at the end). This tool often cuts into the mortar joint, leaving ragged edges and lodgements for the weather, instead of a full joint, with clean top edge, ironed to a degree of smoothness by contact with the under side of the brick trowel in its passage along the joint in the act of cutting off the top edge. A building in which the joints are struck and cut during erection always attracts a better class of workmen than a building carried up rough for pointing, the building thereby benefiting by the employment of additionally skilled workmen.

There is no class of work in the trade upon which the skilled bricklayer prides himself so much as upon the finish of his trowel-struck and cut-joint, and though it may seem incredible to the uninitiated, there are numbers of men who have followed for years the calling of the bricklayer who are unable to strike and cut a joint possessed of the distinguishing characteristics of first-class work.

There are some examples of good brickwork in London which might with safety be cited in specifications as the standard and quality of work required. A plan which recommends itself is to build a sample piece of face brickwork in the early stages of the job, as a standard of work below which the contractor shall not go — a practice very largely followed by engineers, and not confined to brickwork only.

Though the practical bricklayer will in nearly every instance declare in favor of the flat-struck joint because of the facility it affords him of hiding some of the inherent and acquired defects of the bricks (defects of shape, and of damage by transit), yet there is much to be said in recommendation of the weathered joint now in vogue; and in two pieces of work executed at the same time, all conditions being equal, there is no doubt that the weathered joint would be found the more durable of the two, on account of its sheltered position with respect to the face of the building. The top edge of the weathered joint should be struck well back — not less than one fourth inch — and the bottom ragged edge removed, the joint slightly overlapping the top edge of the course below. If the joint is cut above the top edge of the course below, the joint is likely to form an arrestment for the weather, and defeat the object of the weathered joint. Where this form of joint is used, it should be borne in mind that a large proportion of our bricks ordinarily used for facings are not only pervious to moisture, but are active inductors of it, by reason of their porous structure and consequent capillary attractiveness. With bricks of this kind the weathered joint is of little or no use, for the rain, though falling free of the mortar joint in its passage down the wall, will be imbibed by the brick courses between joint and joint, until the wall be well charged with moisture. In weathered-struck joints intended to be first-class work, the bricks should be sorted out to a regular thickness by trying each brick to a gauge. The necessity of this arises from the fact that the top edges of the bricks when building are laid or adjusted to the level of the brick line, drawn from end to end of the wall, and any difference in the thickness of the bricks is, therefore, unavoidably driven into the mortar bed-joint of the course below, and is made very apparent by striking or weathering the upper portion of the joint from one fourth inch to three eighths inch back from the face of the wall. The flat-struck joint, from its comparatively exposed position, is susceptible to injury, and to apparent obliteration by sooty deposits in our large manufacturing towns, losing the interest and units of measurement, which the joints, more than anything else, impart to a piece of work; while the weathered joints, with their play of light and shade, always remain distinctive features, or indices of construction.

Tuck-pointing has done more to bring brickwork into disrepute than any one thing connected with the trade-manual of the bricklayer. Introduced about the middle of the present century as an imitation of gauged brickwork, its chief use has become to cloak up the most inferior work (labor and material), situate mainly in suburban districts. The introduction of this branch of the bricklayer's trade came to him as one of those compensating reliefs at a period when the reign of the stuccoed front, with every circumstance of monotony and ugliness connected therewith, had made his work uninteresting and wearisome; but the prevalent healthy feeling actuating our architects to-day is fast relegating it to the limbo of shams — at least in its application to exterior facings.

A *résumé* of the mode of working will set forth better than in any other way the reasons of objections to this joint. In brickwork intended for tuck-pointing, the joints are raked out during erection and at some future period, when completing the works, are again filled in with mortar assimilated in color to that of the wall by the admixture of earthy pigments, viz., Venetian red, Spanish brown, yellow ochre, etc., depending upon the color required to be produced.

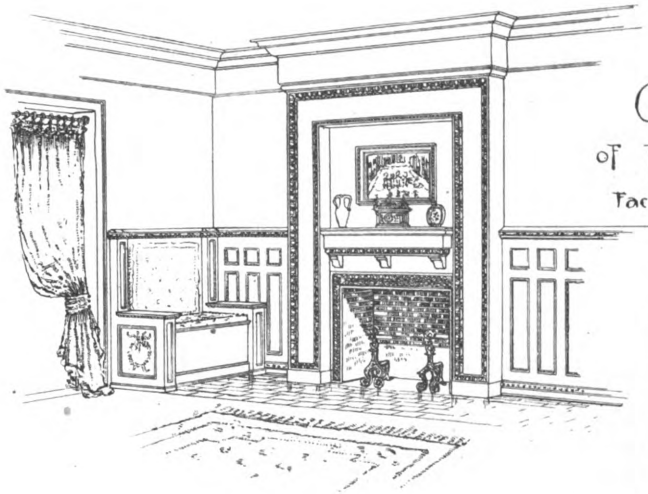
The joints filled in with mortar are rubbed down with a piece of soft brick of the same color as the brickwork, or with a piece of sacking, flush with the general surface of the wall face. The whole surface rubbed down is then coated with color of the same objectionable earthy base, and approximating as nearly as obtainable to a brick color; in the case of stock work or malm-work, green copperas only need be used as the coloring medium. The white putty-joint is then applied by means of a jointer, to the mortar-joint previously rubbed down and colored, the putty-joint consisting of water-slaked or putty lime and silver sand, slightly projecting from the wall face.

The earthy colors used in the stopping mortar are destructive of its setting and indurating properties; and the liquid color or wash applied to the rubbed-down face prior to putting on the putty-joint interposes a separating medium between the putty-joint and the filling-in or stopping mortar, interfering with the firm and proper adhesion of the two. It is true that the alum or copperas used in the liquid color may, after it has crystallized, assist the adhesion of the two joints.

The above enumerated causes, combined with the fact that the putty-joint stands out from the wall, however slightly, subject to the solvent action of rain and the destructive action of frost, easily accounts for the short life of tuck-pointing in exposed situations. When tuck-pointing was first introduced, it was customary to make an incision along the middle of the filled-in joint, which was done by running the point of a fairly large-sized nail along the top edge of a rule held in the position to be subsequently occupied by the putty-joint. In this way a key or clinging for the putty-joint was obtained, but which is now seldom or never done. Another objection to tuck-pointing and generally to the application of color to brickwork is that a true brick color and face cannot be obtained by this process, nor by any other known process; for no matter how closely bricks are sorted for uniformity of color, there are sure to be inequalities of tint and blend, constituting much of the beauty of good brick-facings, an effect which cannot be obtained or imitated by the application of color.

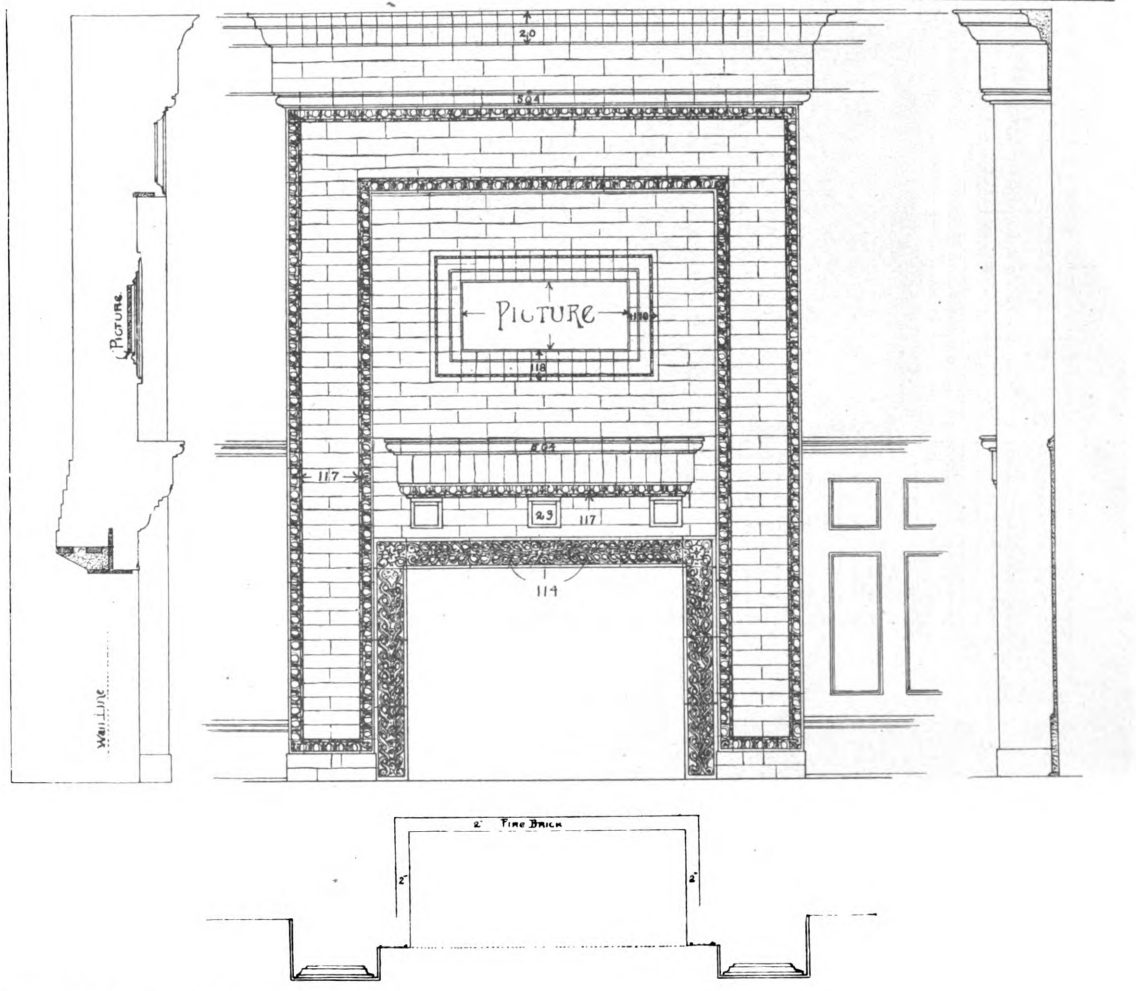
This characteristic is more apparent in "picked" London stocks than in any other class of bricks, the high dark-brown tints of which are due to the presence of iron in the clay and intense firing — a sure indication of a good stock brick. A knowledge of the character of the clay of brickmaking districts will sometimes assist in the choice of a brickmaker. Loose sandy clays, requiring a large proportion of chalk in their composition, produce bricks of a color approaching to that of a malm, but of a light, specific gravity and porous structure, while the purer class, consisting chiefly of alumina, with little or no uncombined silica, requir-less chalk, producing bricks of a harder and more enduring chare acter. Still, it is surprising how some of the softer kinds of stock bricks and malm bricks, when made from good clays well tempered and thoroughly fired, will harden by exposure, and form a skin upon their outer faces, which can be removed only with difficulty. Stock bricks of this kind, though soft, are of a close, firm texture, a section of the brick, when broken, showing that the clay has been thoroughly pugged and well driven into the brick mould in the making.

(*To be continued.*)



CREAM BRICK MANTEL
OF PHILADELPHIA AND BOSTON
FACE AND ORNAMENTAL BRICK
SUBMITTED BY
"A ONE YEAR CUB"

20	42 HEADERS	$4.41	
	1 K RETURN	.22½	
	1 L RETURN	.22½	
23	3 BRACKETS	1.50	
119	12 STRETCHERS	3.20	
	8 CORNER PIECES	.88	
117	8 CORNER PIECES	5.60	
	14 RETURN	.52½	
	12 RETURN	.52½	
	21 HEADERS	2.2.05	
	24 STRETCHERS	9.10	
118	33 HEADERS	3.15	
	4 CORNER PIECES	1.40	
504	30 HEADERS	3.40	
	2 RETURNS	1.03	
PLAIN	STRETCHER	6.48	9
	HEADER	5.40	74.78

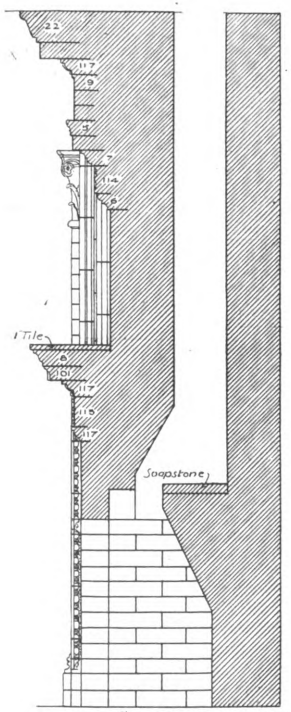


FIFTH PRIZE.

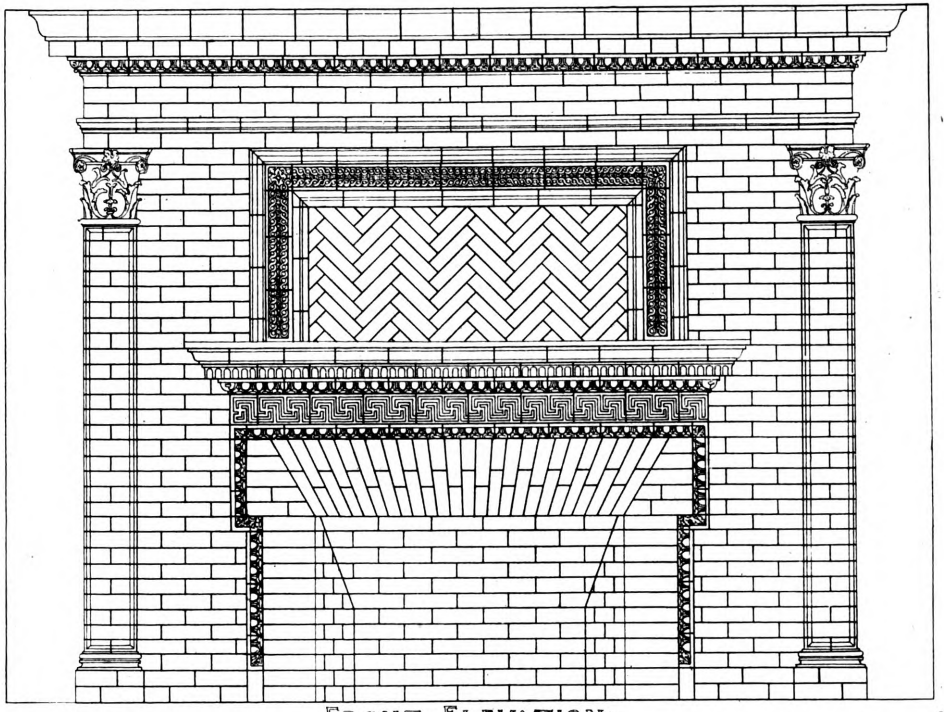
A ONE-YEAR CUB.

BRICKBUILDER COMPETITION No. 5.

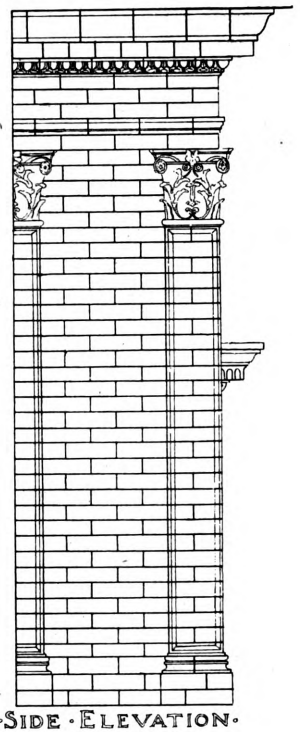
DESIGN FOR A BRICK FIREPLACE.



·SECTION·



·FRONT·ELEVATION·



·SIDE·ELEVATION·

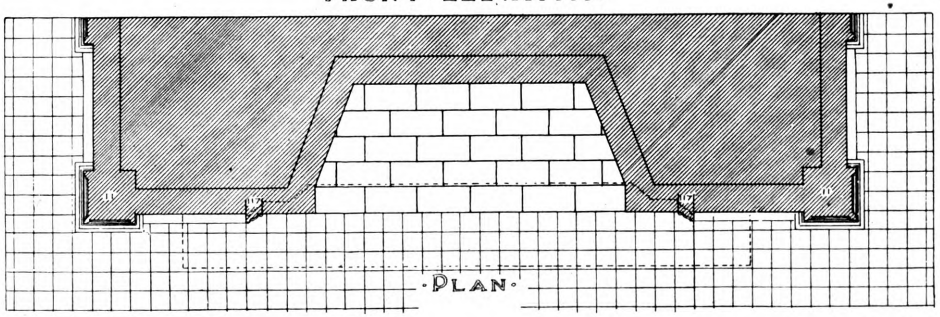
NUMBERS REFER TO THE PHILADELPHIA AND BOSTON FACE BRICK CO'S CATALOGUE.

DIMENSIONS					
WIDTH OF BREAST	10	FT	0	INS
HEIGHT " "	9	"	0	"
WIDTH " OPENING	4	"	0	"
HEIGHT " "	2	"	5	"
DEPTH " "	1	"	8	"
HEIGHT " SHELF	4	"	8	"
DEPTH " BREAST	2	"	8	"

PRICE

FACE BRICK WORK INCLUDING FIRE BACK, UNDER FIRE AND TILE SHELF COVERING, IN

RED BRICKS	$94.00
CREAM "	141.00



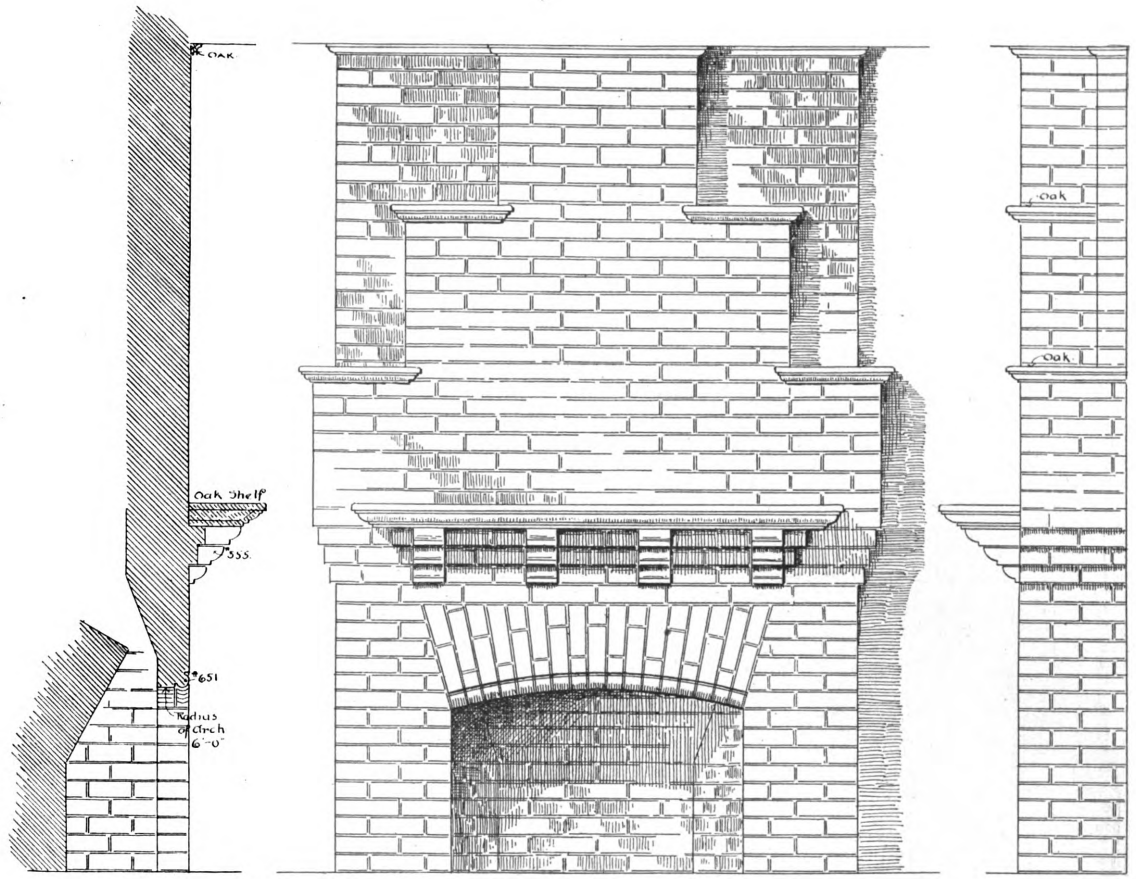
·PLAN·

FIFTH PRIZE.

WILL S. ALDRICH, SOMERVILLE, MASS.

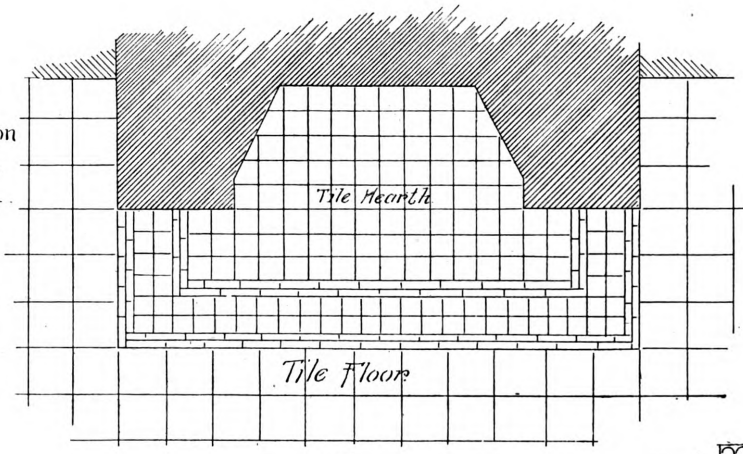
BRICKBUILDER COMPETITION No. 5.

DESIGN FOR A BRICK FIREPLACE.



-Section- -Front- -Side-

Estimate of the New York Anderson Pressed Brick Co. For brick necessary to build this Mantel and Fire-place. $26.83



Mantel of Coral Brick.

-Plan-

Monsieur

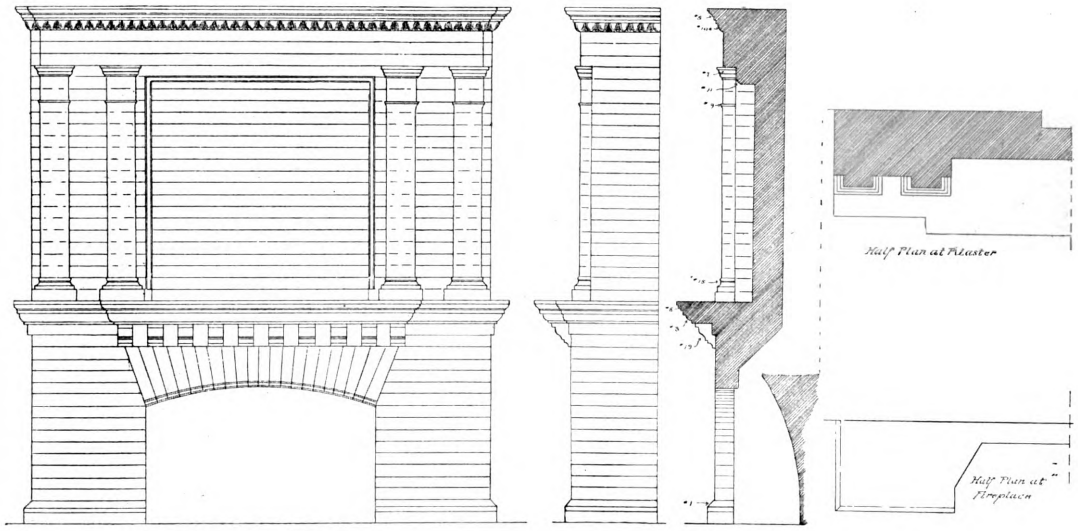
-SCALE.-

FIFTH PRIZE.

RAYMOND F. BOCORSELSKI, HARTFORD, CONN.

BRICKBUILDER COMPETITION No. 5.

DESIGN FOR A BRICK FIREPLACE.



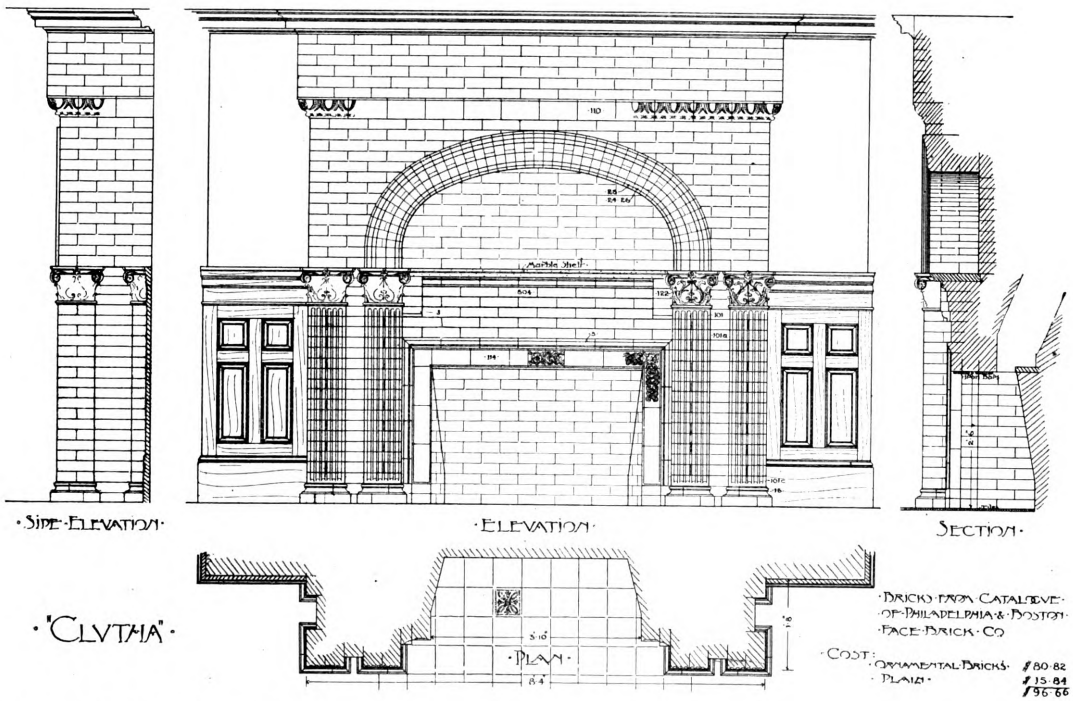
Philadelphia & Boston Face Brick Co's
— Bricks used —

Cost of Face Brick ---------- $29.64
Cost of Ornamental Brick — 28.85
Total — $58.49

By "JJ"

BRICKBUILDER COMPETITION No. 5.

W. P. CRABTREE, NEW BRITAIN, CONN.



"CLYTHIA"

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COST: ORNAMENTAL BRICKS $80.82
PLAIN $15.84
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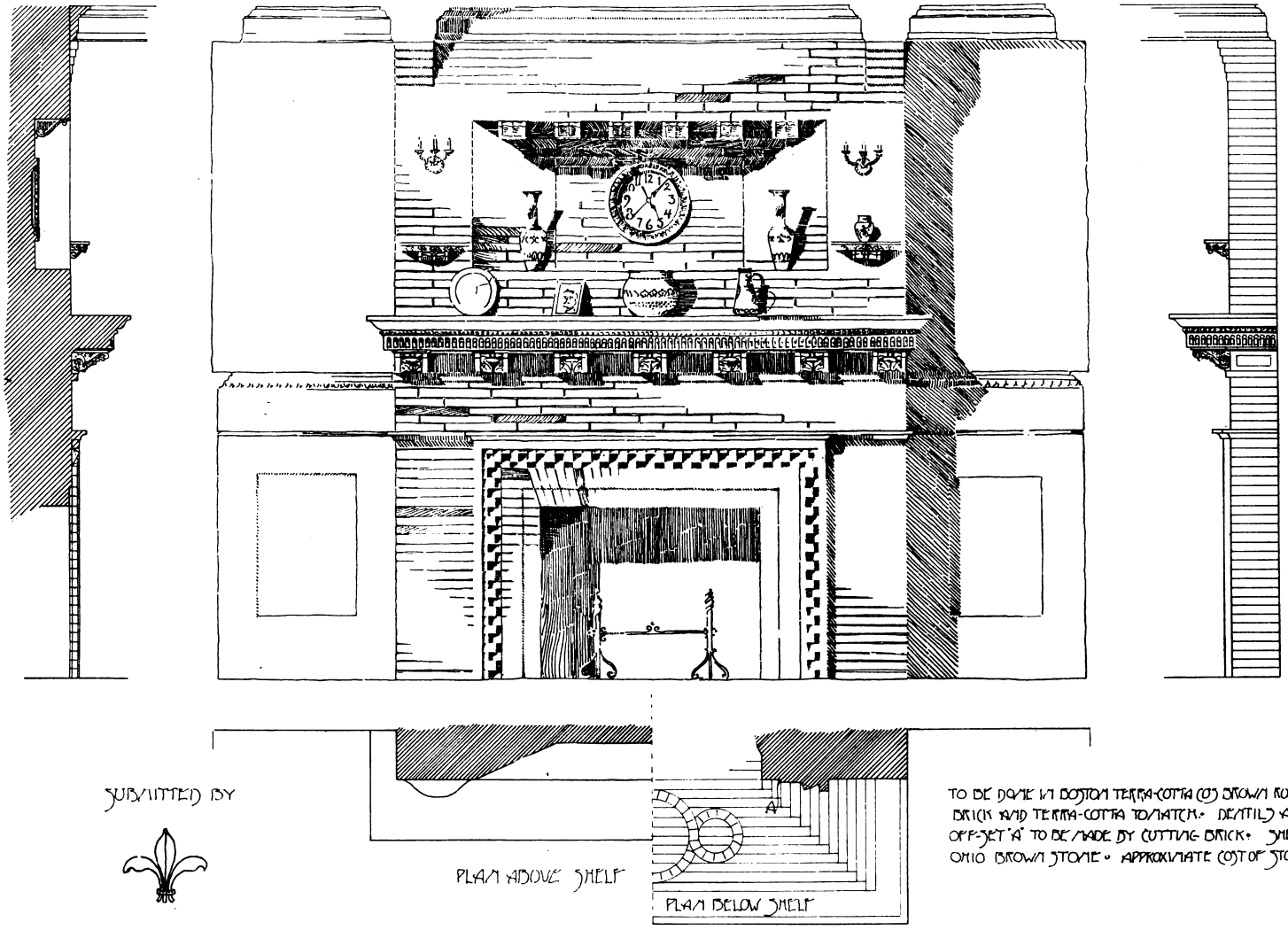
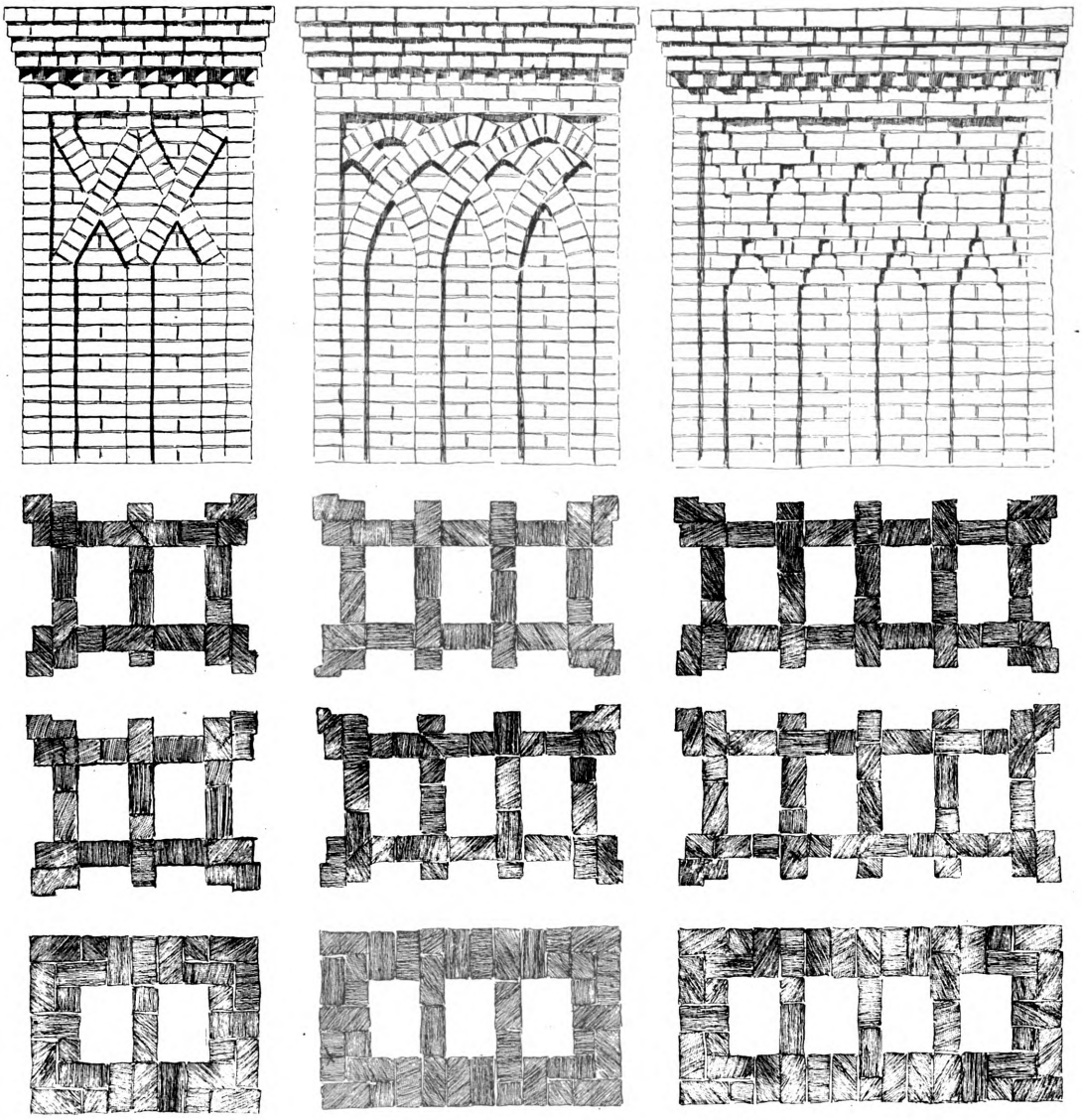
BRICKBUILDER COMPETITION No. 5.

WM. S. MACLAREN, BOSTON, MASS.



BRICKBUILDER COMPETITION No. 5.

R. A. GREENFIELD, NEW YORK CITY.



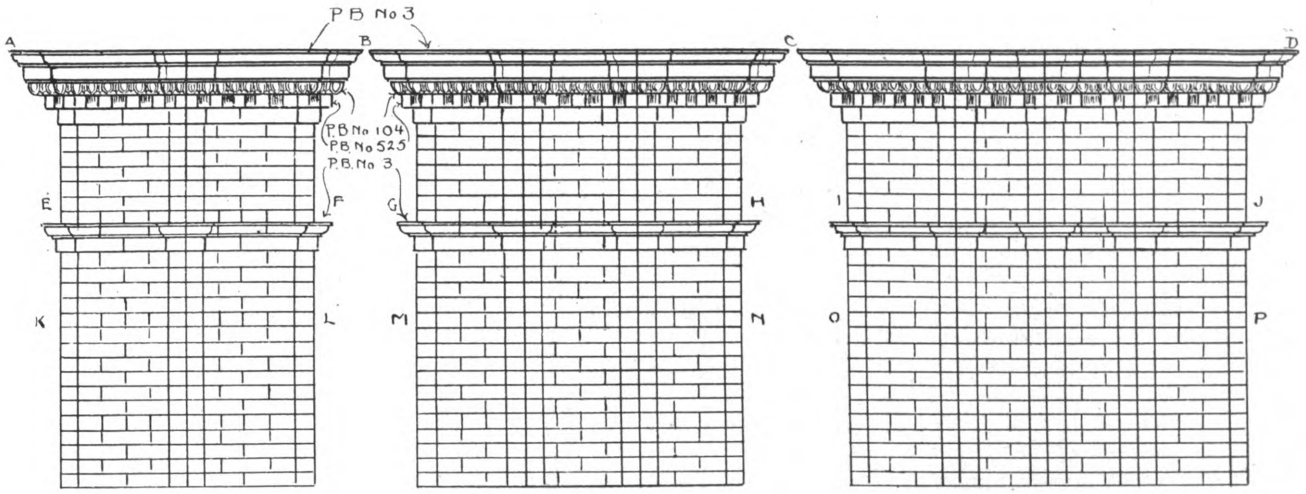
FIRST PRIZE.

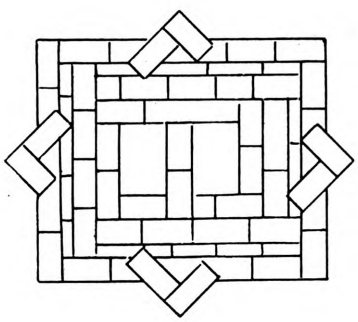
WALTER H. KILHAM, BOSTON, MASS.

BRICKBUILDER COMPETITION No. 4.

DESIGN FOR CHIMNEY-TOPS.

SCALE: ½ INCH TO A FOOT SUBMITTED BY SMALL





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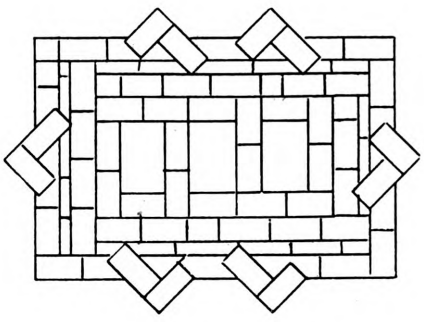

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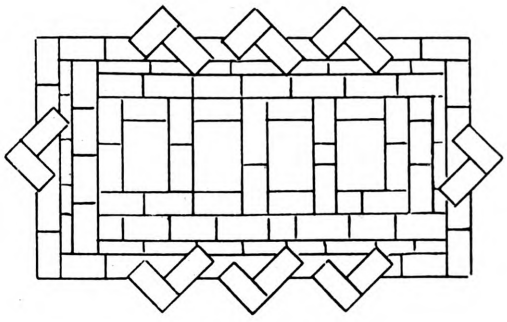

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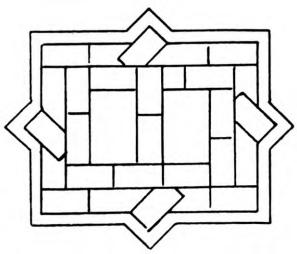

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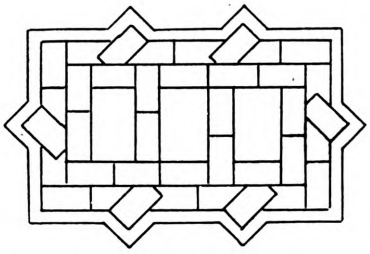

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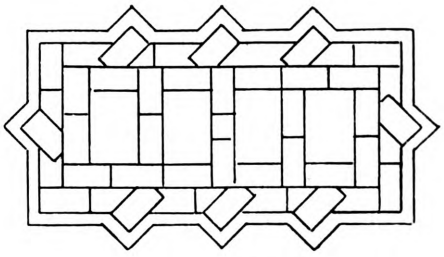

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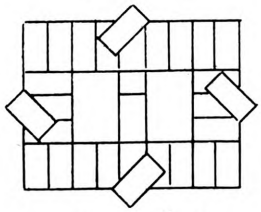

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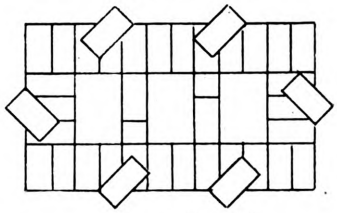

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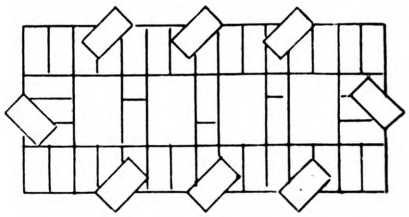

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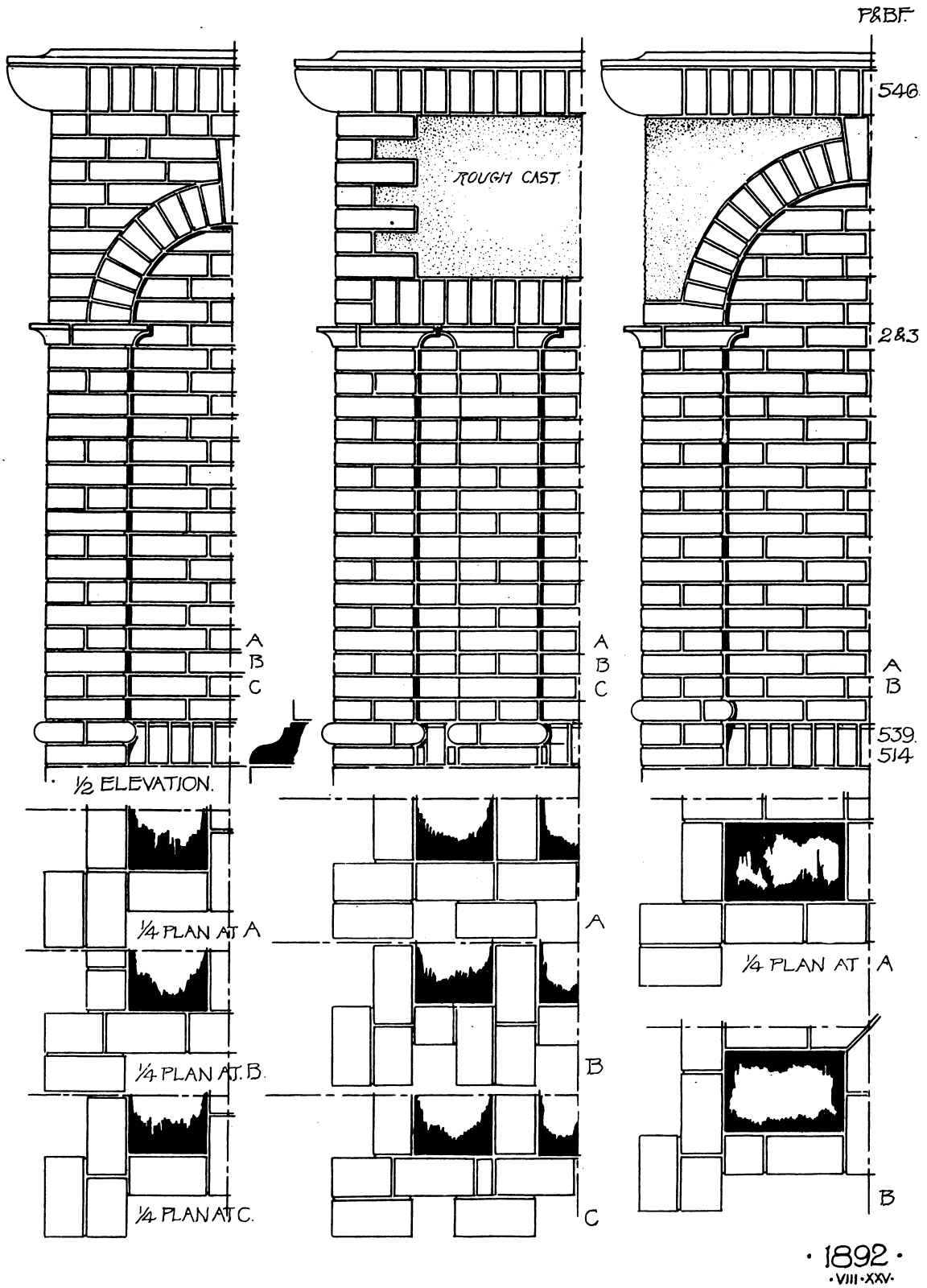
SECOND PRIZE.

BRICKBUILDER COMPETITION No. 4.

DESIGN FOR CHIMNEY-TOPS.

G. F. CRUMP, ALBANY, N. Y.



THIRD PRIZE.

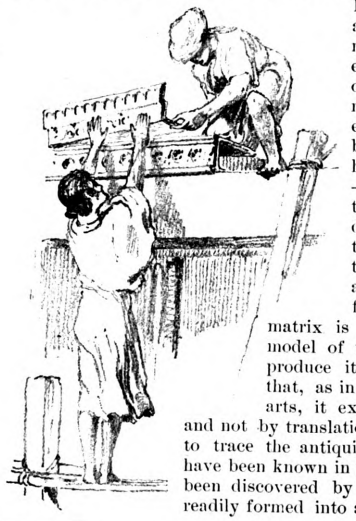
H. G. FLETCHER, SOMERVILLE, MASS.

BRICKBUILDER COMPETITION No. 4.

DESIGN FOR CHIMNEY-TOPS.

ANCIENT USES OF TERRA-COTTA.*

THE pottery shard is wellnigh imperishable. Of a material plastic, fine, facile to take every impress that man conceives, equally lending itself to broad surfaces and to subtle subdivisions, capable of being moulded into forms as fine as those of metal and as massive as those of stone, there remained but one thing to be desired, — durability. Clay crumbled and became dust, moisture was fatal to the forms in which it was cast, and disintegration began even before the work was complete. Two of the elements of nature had been invoked to make the form of clay; it required the third to complete its creation. The modelled form, submitted to the power that destroyed all other materials, that made wood into ashes, that crumbled stone and melted metals, received from it a permanency that nothing except pulverizing could destroy; the clay, soft and pliant, falling to pieces at a touch, became, under the action of fire, terra-cotta, hard, firm, elastic, capable of withstanding more than iron, and retaining the slightest mark upon its surface with a persistency greater than that of stone. It is to this material that time has intrusted the records of dynasties and of empires. The potsherds of Hissarlik and of Santorin, the vases of Greece and of Rome, tell us as complete a story as all else that remains of the past. Whether it be the glazed bricks of Nineveh, or the fragments of Monte Testaccio, each piece of fired clay bears a testimony that time has not been able to efface, — a testimony not only of the period, but of the individual, of the touch of the man himself. For though terra-cotta often and usually takes its form from a die, the original matrix is taken directly from the model of the artist, and should reproduce it in every particular; so that, as in few other of the artisan arts, it expresses the artist directly, and not by translation. It is futile to attempt to trace the antiquity of the art. It must have been known in prehistoric times and have been discovered by chance. No material so readily formed into a drinking vessel as clay; and such a vessel once formed, no more natural consequence than that it should have been put over or into fire to heat whatever it contained. The discovery of the durability given it by the action of fire would follow as a matter of course.



Yet both the Egyptians and Assyrians fired but few of their brick, trusting to the intense heat of a tropical sun to give durability to the square masses of clay of which they built their walls, and the sun-burned bricks of Nineveh have crumbled back again into mounds. The face walls of the buildings, it is true, were covered with a vitreous glaze, which required firing, and the brick on which this glaze is formed are consequently hard and sound; but the use of the terra-cotta, apart from the pottery, does not appear to have occurred in architectural forms before the time of the Greeks.

It appears first in the gutters to the temples, the *cymatium* or upper moulding being made of terra-cotta, as of great durability. This seems to have happened in some of the early wooden temples, and also in those that were covered with metal plate. The earliest of these gutters were painted, but later they began to be modelled, the painted forms being repeated in the modelling. The first modelling is entirely that of impress into the form, scratches, dots, and outlines etched into the clay. It is some little time before raised ornament makes its appearance. The same thing occurred in the pottery; it was natural that drawing merely should antedate modelling in the round.

The outlines of the painting on the earlier work were etched with a sharp point, and the color filled in between.

The workmen upon the terra-cottas were a band of artists whose craft was handed down from father to son; and as they shaped the forms upon rude tables, or painted the antifixes, or carefully set the crowning mouldings upon the temples, they developed a pleasure in their work, which is manifested by the pride with which they signed their names upon it, adding the phrase, "I, the Athenian, made it."

The Etruscans used even more vivid coloring than did the Greeks, and, in common with all barbaric peoples, preferred yellows and brilliant reds. Their towns were small, and neighboring communities constantly menaced each other, so there was little of the comparative security which would allow commerce, or the working of quarries of marble or of other stone. The artisans, therefore, turned their attention to pottery and to bronze, and terra-cotta was an excellent material upon which to display brilliant pigments. Not only was it used as elsewhere for struc-

*This article was originally prepared and published by the *Architectural Review* as an advertisement of the New York Architectural Terra-Cotta Co. It is so good and so cleverly illustrated that we republish it, by permission of both parties interested.—*Ed.*

tural portions of buildings, but all ordinary utensils were made of it, and it was finally used to receive the remains of the men whom it had so well served during their lives. The sarcophagi of the Greeks were hewn from a single stone; those of the Etruscans were cast in terra-cotta. Some, that were more ambitious, had the carefully modelled works of artists upon their lids, the recumbent figures of the dead, with an attempt at portraiture in the features, but by far the larger number were impressed by moulds, so that there were many replicas, more or less crude, which differed from each other in coloring only. The sides and ends were usually decorated with mythical scenes, the sacrifice of Iphigenia and the mystery of Mithras occurring most frequently. Often the modelling was merely touched with vermilion, the color with which conquerors smeared themselves as emblematic of victory, and which played so large a part in the polychromy of the past. The funeral rites of the Etruscans must have been unusually solemn. The tombs were excavated in tufa below the surface of the ground; and long narrow staircases led downward apparently into the depths of the earth; at intervals opposite each other, on either side, were niches in which torch-bearers stood while the proces sion slowly descended alternately in the torchlight and the darkness into the tomb chambers below. There terra-cotta Gorgon's heads leered from the walls, and a lamp of the same material swung from the ceiling by a leaden cord. The main chamber in the larger tombs, such as that in the environs of Perugia, was devoted to the funeral ceremonies, while all about it niches contained the sarcophagi of the different members of the family, each of terra-cotta, and each colored upon nearly its entire surface. The backgrounds of blue, the dull red of the flesh of the male figures, and the white of the female, the scarlets, yellows, and greens of the draperies, though crude when seen in strong light, must have been rich and decorative in their effect in dim light against the background of the niches. Doubtless there were emporiums for these sarcophagi, as there are tombstone marble yards to-day, and contiguous to the street of tombs of Veii were workshops where the terra-cottas were pressed into forms, baked and decorated, and where one might choose the future receptacle for his ashes.

In Asia Minor large terra-cotta vases were used as sarcophagi, such vases or jars as those for wine and oil. The body was doubled forward from the waist with the head between the knees in order to adapt it to the scant space, and the vase itself, slung upon long staves, was carried in the universal manner of carrying burdens in the East. These vases were buried upright in the grounds. The columbaria, or rooms with little niches for small vases containing the ashes of the dead, seem to have been used by the Romans more than by other nations. The funeral urns of the finest of baked clay were decorated by the best work of painters who were skilled artists, and whose very touch had character and force. And it was not alone with painting that these urns were decorated, but with bas-relief, with applied enamels and rich sculpture, so that some of them are of priceless value.

The terra-cotta urns, like all else in this imperishable material, remain better preserved than any of the later work in marble or in bronze. Many of the bronze forms are copied in the terra-cotta, which seems to have lent itself to subtle form equally well with metal itself. In the early works of art, skill seems to have been commensurate with the facility of working the material used, and bronze and terra-cotta attained a high degree of perfection long before marble or other stones were skilfully handled. In

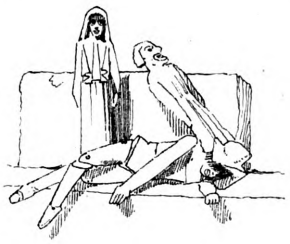
modelling the clay, the very curves caused by gravitation had a subtler line than those hewn out of stone, and it is to the freedom with which clay can be handled that terra-cotta owes much of its charm; a charm similar to that in an artist's sketch, where the material has been felt to be no obstacle to the thought.

It was not alone in the arts of peace and in the burial of the dead that terra-cotta was of use. A material so easily obtained, so capable of being fashioned by even unskilful hands, and of so little cost, could not fail to become of value in the paraphernalia of the constant wars that formed the greater part of the life of the East. The libations to the gods before battle were poured from terra-cotta craters, the perfumes and incense that smoked before the altars of Tanith, of Poseidon, and of Mars, burned upon terra-cotta vases; the poorest of the soldiers wore breast-plates of terra-cotta scales, and some, at times, strapped shards to their feet as protection. Light as well as strong, the towers upon the elephants used in the armies of Carthage, and the great plates which adorned their breasts, were occasionally made of terra-cotta, gorgeously painted in many colors. Masks of clay, with grinning, grimacing faces, were propped above the edges of the circumvallation trenches to frighten the enemy. The captains drained *pateræ* holding spiced wine before they entered the fray, and received, when wounded and burning with thirst, water from the earthen bottles carried by the hoplites. Everywhere in the midst of sieges appeared this imperishable material. The walls of cities were built of it, with corbelled, projecting battlements, whose overhanging masses were pierced with apertures through which, mingled with the streams of molten lead, the speeding arrows and stones, great masses of baked clay were hurled down upon the heads of the besiegers. The very streets were paved with it, and the ditches about the walls were filled with broken sharp-edged potsherds to cut the feet of assailants. The cohorts of slingers in the armies carried bags of clay bullets about their waists, which were replenished, as their stock was exhausted, from great sacks of ammunition under which long lines of camels staggered in the rear of the combatants. These bullets were stamped with the symbols of the country from which the soldiers came, as, for instance, those of the Egyptians bore an ape's head, the Asiatics, a hawk or a pomegranate, the Greeks, a citadel or the name of an archon. They also bore inscriptions in much the same way that the swords of later days had inscriptions upon their blades — vindictive wishes or adjuration, such as "Kill," and "Slay the enemy."

The catapults, huge engines brought to the sieges upon carts drawn by horses or oxen, which hurled from a spoon-headed lever projectiles over the city walls, were furnished with great terra-cotta balls, or with earthen pots containing the celebrated Greek fire, or substances giving out a noisome stench. These were the bombs of ancient warfare breaking upon the ramparts and within the streets, and wounding with flying fragments of sharp cutting clay. They must at least have been more formidable than the arrows of the heavy and slow *ballistæ*. The smaller catapults were nicknamed *onagers*, or mules, as they threw stones in much the same way as mules kick up the earth with their feet, and were exhorted by

the inscription on their projectiles to "kick well." These symbols and inscriptions stamped upon the terra-cotta were the impress of hand seals of metal, the same sort of seals, excepting that they were less fine, as those used to make the Greek coins, and to stamp the Pompeiian loaves. The bullets of the slingers, the projectiles of the catapults, and fragments of the broken pots of fire, each was alike imperishable and has lasted through the centuries, and held its testimony of some importance in the slowly growing history of a time with but few other records. The impress in the clay has outlasted gold or silver, brass or iron, and is as intact to-day as when whirled in the leathern thong of a Balearic slinger, or lifted into place upon the catapult by the soldiers of Hannibal or Alexander.

The armies of Belisarius used similar missiles to those of the Romans and Carthagenians, but the buildings of that new Rome which was growing upon the shores of the Golden Horn, of that Byzantium whose statues were said to outnumber its people, were being developed in a new and brilliant architecture different alike from that of Greece or Rome. As in Rome, the walls were built of brick, which were clothed formerly with slabs of marble, but now by mosaics surging up the walls and over the domes. At the bases of the domes windows gave light to the halls below, and in these windows were pierced screens worked or carved to elaborate patterns. Though these were often of marble, at times they were made of terra-cotta, the perforations holding glass of brilliant colors. The Oriental windows of the mosques were of similar designs, but made of two sheets ofsawn wood, between which, at the piercings, pieces of brilliant glass were placed. The Byzantine terra-cotta windows had the glass inserted in the clay before baking, or else fastened with cement. Besides these windows there were terra-cotta screens or balustrades of the peculiar pointed acanthus woven into interlaces. The roofs were, of course, tiled as before, and now vitreous glazes begin to appear on the tiles, green and purple and black and white, so that some of the domes were of the colors of the feathers of a partridge-wing, or of the breast of a pigeon. In the mosaics terra-cotta was very little used, glass forming the principal material. Occasionally a very small piece would be found forming a red spot in a design, but in such a case porphyry was much more apt to be used, or brilliant carnelian. The statues, however, which still retained a great deal of the polychromy of the Greeks, were still, at times, cast in terra-cotta, and the little statuettes, such as those of earlier date from Tanagra, which were used as household Lares or Penates, or at times as ornaments merely, were all of terra-cotta. These were colored exquisitely, and beautifully modelled. There were also terra-cotta dolls for the children, more durable than the lead ones which the little Pompeiian children left scattered in the atriums; and some of them were jointed very much like the porcelain and china dolls of to-day. Their clothes were modelled upon them, however, and colored crudely, red seeming to have been the favorite color of the small Byzantines. As for utensils, they only differ in their forms from those of centuries before, terra-cotta still remaining the usual material for all vases and urns, bottles, etc. There are a few actors' masks remaining, but terra-cotta was usually too heavy a material for these, and those existing were probably signs of the mask-maker's craft. All sorts of signs were made of terra-cotta, from the loaves over a baker's door to elaborate bas-reliefs depicting the entire processes of manufacture going on within; and there are terra-cotta doorplates. The ancient furnace pipe was also terra-cotta, and was built into the wall and around the base of the room. This was universal in the Roman and Byzantine baths, and can be found in some of the remains of private houses. In fact, there seem to have been few of the daily crafts in Byzantium that did not employ terra-cotta in some one way or another, whether in the form of sharp-edged shards for cleaning the skins of animals outside the city walls, or bowls from which were drank the hot spiced wines during the winter winds from the Black Sea. Like all the ancient peoples, the Byzantines had terra-cotta to thank for much.



Don't fail to read the announcement on page 3 of cover.

GOOD FIREPROOF CONSTRUCTION.

The report of the burning of the partially completed Athletic Club building in Chicago is still another proof of the value of clay fireproofing materials as a protection for structural iron and steel work. According to newspaper reports, ornamental stone work, interior finish, and materials piled on the different floors were damaged to the extent of $100,000 or even more, while the frame of the building, encased in terra-cotta fireproofing, was not enough damaged to mention.

This is only an addition to a long list of instances proving the fire-resisting quality of this form of construction, which is probably used to a larger extent in Chicago than elsewhere. We are at some loss to account for the heavy damage to stonework reported, for such buildings are almost always constructed without much use of stone. To every one who witnessed the Boston fire on Thanksgiving day, three years ago, the destruction of the beautiful Bedford Street Ames Building, designed by Richardson, was an effective object lesson in the havoc a hot fire plays with stonework.

We take the liberty of publishing the following from the editorial columns of the *American Architect:*

"A new sort of roofing has been patented in Germany, and in several other countries, which seems to have good qualities. The history of the invention is rather interesting. Herr Siebel, of Düsseldorf, remembering, what all architects know, that the best protection against damp rising from the ground into walls is a sheet of lead, and remembering, also, that, on account of the great expense of a lead damp-course of sufficient thickness to support the weight of the superstructure without tearing, it is quite common in these days to use as a substitute a sheet of tarred felt, conceived the idea that the advantages of both materials might be united by enclosing a thin sheet of lead between two thicknesses of tarred felt. In this way, while the enclosing felt protects the lead from being torn by the irregularities of the masonry, and from corrosion by the lime of the mortar, the metal, although thin, interposes an impenetrable barrier against dampness, which is not liable, like the felt alone, to gradual decay. Moreover, the combined felt and lead is much cheaper than lead alone, of the thickness that it would be necessary to use, and although patented, it is available, so far as cost is concerned, for buildings of very moderate pretension."

THE BRICKBUILDER COMPETITIONS.

RULES: All drawings must be sent in marked with some motto or device, and accompanied by a sealed envelope marked with the same, containing the full address of the competitor. The designs are judged by a committee of well-known architects, solely upon their merits, the names of the designers remaining unknown until the award is made, when the sealed envelopes corresponding to the devices on the designs are opened. To protect the interests of our advertising patrons it is stipulated that no ornamental bricks not found in their catalogues shall be used. This is really no restriction, for practically all of the leading manufacturers will be found represented in THE BRICKBUILDER. To encourage the study of effective use of the commoner materials, of two designs equally good, preference will be given that showing a skilful use of ordinary bricks to secure ornamental effect.

REPORT OF THE JURY IN THE COMPETITION FOR BRICK FIREPLACES.

Of the designs submitted in competition for a hall mantel none quite reached the standard of the best design, while yet a large number were interesting and suggestive though not without faults. *Yule log* was placed first as being the best in general conception and treatment, and thoroughly suitable to the material. There is, however, a certain heaviness in the proportions which further study might have improved.

Ball and wings is a very graceful and well-proportioned design; but it is faulty in that it would be more suitable to stone than to brick. Over the fireplace opening is what in treatment is a panelled lintel, which being made up of narrow bricks would have to be supported by an iron bar. A frank adoption of a flat arch would have been much better both in design and construction.

While *ball and wings* has a false treatment of the span of the opening, *Albanian* has no recognition whatever of any means of spanning it. The latter is perhaps more frank, but is even less desirable as a matter of design. A flat brick arch should have been frankly used. In other respects *Albanian's* design is well proportioned and appropriate.

The design marked by a *scribbled hieroglyph* is somewhat similar in idea to that of *ball and wings;* but it is not so well proportioned, and the projection of the arch over the shelf would have, in reality, a most unfortunate effect. The design is interesting in elevation, but would prove much less attractive in perspective.

Nemo's design would have been better if the panelling above the shelf had been simplified, perhaps by using a single large panel instead of cutting up so much the face of the breast. The position of the pilasters below is also a little unfortunate. In fact the omission of the pilasters altogether would have improved the design.

Wreath treats his pilasters better, but the design is unnecessarily heavy and ungainly, and the motive of pilasters and entablature (*i. e.*, of post and lintel) as adopted in the upper part of the design is hardly suitable to brickwork. A lintel made up of small pieces such as bricks is an absurdity. For this reason the frank recognition of the iron lintel used over the fireplace opening is to be commended. If such a lintel is required it ought to appear, so as not to give the impression to the eye (as do some of the other designs and the upper part of this) that the bricks above the opening are without support and will fall out. In most cases, however, some sort of arch is to be preferred to an iron lintel. The drawing is to be commended also for its rendering.

Trefoil leaf has good elements thrown together somewhat at haphazard, and without sufficient study of proportion.

A one-year cub sends a simple, attractive, and appropriate design. But here again there is no recognition of any support for the bricks over the opening.

J. J. is straightforward but somewhat commonplace.

Monsieur has a good, simple design, — a trifle too bald, however.

Clutha's mantel-piece suggests a good idea that might have easily been better worked out. The shape of the arch is especially unfortunate.

One of the best designs submitted is that of *Fleur-de-lis*. It is with regret that the jury feel obliged to place this *hors-de-concour* as it hardly meets the condition of the problem which calls for a mantel of *brick* from the makers' catalogues, while the architectural treatment of this mantel depends entirely upon its terra-cotta.

It may be said that the construction of the fireplaces in many of the designs submitted is very defective, especially as regards the throat of the chimney. But this has not been insisted upon as it does not affect the design.

By a mistake of the printer, Mr. G. F. Crump's name was placed on the second prize design for a brick fireplace in place of Mr. Green's, and Mr. Jas. C. Green's name was printed on the third prize design in place of Mr. Crump's (see August number). The design marked by *ball and wings* was awarded the second prize by our jury, and its author is Mr. Jas. C. Green, of St. Louis; that "submitted by Albanian" receives the third prize, and its author is Mr. G. F. Crump, of Albany. We are indebted to Mr. Crump for calling our attention to this mistake.

The designs of brick fireplaces awarded first, second, third, fourth, and two of the fifth prizes were published in the August number.

AWARD OF COMPETITION NO. 4. CHIMNEY-TOPS.

Plate 70. First prize, $10.00, "Two concentric circles," Walter H. Kilham, Boston, Mass.

Plate 71. Second prize, $7.50, "Small," G. F. Crump, Albany, New York.

Plate 72. Third prize, $5.00, "1892," H. T. Fletcher, Somerville, Mass.

Fourth prize, $3.50 book, competitor's selection, "Header," J. T. Maclaren, Philadelphia, Pa.

REPORT OF THE JURY IN THE COMPETITION FOR CHIMNEY-TOPS.

The designs marked by *two concentric circles* are placed first. They show an excellent treatment of chimney-tops in plain brick without the use of any moulded brick except at the angles, and are at once simple, effective, and appropriate. The tops should have been built with eight inches of brick instead of four inches around the flues, and the angles are unnecessarily weak in construction.

Small's designs are also good, and are placed second only because less distinctively brick. The construction is better than in the case of the first design.

1892's chimneys are good, but would be less effective than the others.

The designs submitted by *Header* follow the precedent of a great many excellent old English chimney-tops, but the proportions might be improved. As they stand, the designs are a little top heavy.

The publishers desire to state that the designs of chimney-tops by *Header*, J. T. Maclaren, Philadelphia, Pa., were unavoidably left out of this number but will appear in the following number.

The designs submitted in competition No. 6, an arched window opening, and the award of the jury on same, will appear in the next number.

Will the gentleman submitting fireplace design under *nom de plume* of "One-Year Cub" please send us his address, as it was never received?

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SUPPLEMENT TO THE BRICKBUILDER.

OCTOBER, 1892.

VIEW OF SHIPLAKE COURT, ENGLAND, FOR R. W. C. HARRISON, ESQ.
ERNEST GEORGE AND PETO, ARCHITECTS, LONDON.

The Brickbuilder.

VOL. I. BOSTON, OCTOBER, 1892. No. 10.

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The following appears in the editorial columns of a recent number of *Stone*: —

"Imitation seems to be the besetting sin of builders. The great aim now is to erect pretentious structures which shall compare in outward appearance with the better class of buildings, and at the same time be put up at the minimum of cheapness. This point is well illustrated in Indianapolis in the construction of the new building to replace the old death-trap used for a medical and surgical institute, destroyed by fire with such appalling loss of life. The new institute building will be more substantial than the old one, but cheapness is the object aimed at, while the desire to imitate the outer appearance of a noble building is strong. To carry out this design rock-faced brick are being used in construction. These brick are made in imitation of sandstone, which is so often used in public buildings. No argument in favor of the use of such material can be advanced excepting that of cheapness, and to secure that end, durability and solidity are sacrificed, and buildings erected adorned with the most ornate ornamentation to cover up defects in material or construction. Those who have the erection of this institute building in charge are no more offenders than hundreds of others. It is a spirit which has seized the people, and until the incubus can be shaken off there will be more or less of cheap, unstable buildings. It were better that the buildings in all such cases be made smaller so that the genuine stone could be used in construction and at the same time keep within the limit of cost. If rock-faced building stone is to be imitated, it is surely a strong argument in favor of the use of genuine stone in the erection of buildings. Only good things are imitated, and 'imitation is the sincerest flattery.' It would be well for those contemplating the erection of any building to stop and consider carefully before accepting rock-faced brick in the place of stone, merely because it costs a few dollars less."

Our esteemed contemporary is certainly mistaken in supposing that it is "merely because it costs a few dollars less" that people are led to use rock-faced brick in place of stone. Every one else has long since discovered, if *Stone* has not, that brick is much more durable than stone, and undoubtedly it is the greater durability of the brick, and its superior fire-resisting quality, coupled with the liking many people seem to have for a rock-faced brownstone front, which leads to the use of this imitation; a "flattery" which is entirely uncalled for in our opinion, as good brickwork makes a more beautiful wall than any rock-faced brownstone ever quarried. But even if this were not so, we deplore the imitation as much as the writer in *Stone*. The imitation of one material in another is never desirable artistically. The best results are always obtained, as we have frequently had occasion to insist, by making the characteristic qualities of the material the very means of producing effect. Had *Stone* confined itself to the artistic argument we should not have had a word to say. But when it says "no argument in favor of the use of such material can be advanced except that of cheapness," it is clearly beyond facts which it ought to be familiar with.

The principal argument in favor of the use of brick or terra-cotta materials is that they are more durable than stone, and vastly superior in fire-resisting qualities as has been repeatedly proved, and the provisions of the best building acts show that this is universally admitted. Artistically these materials are capable of as noble treatment as any, if only their characteristic qualities are respected.

In the last number we referred to the criticism of THE BRICKBUILDER contained in the *Architectural Era*, and reprint it here. We regard this notice of more than ordinary value, coming as it does from Prof. C. Francis Osborne, of Cornell University, who, since taking the editorship of the *Era*, has brought it up to a high standing as a critical journal of architecture: —

"There is no journal which comes to our office table is read with more interest and pleasure than is THE BRICKBUILDER. Like most papers issued for the purpose of advocating a reform, it is not lacking in vigorous and decisive writing, and where the reform is one of which we can approve, nothing is lacking to put us *en rapport* with its staff of writers, or for the enjoyment of its contents. The first number appeared in January of the current year and announced its mission to be the improvement of the art of brick composition in this country, by bringing the brickmaker and the architect into more intimate relations, by publishing views of the best brick architecture of the Old World, and by inviting friendly competition among its readers for problems in artistic arrangements of burnt clay. It has contained an abundance of sound and vigorous writing on its special topics, and we would especially commend to our readers the article in the first issue, entitled "A few neglected Considerations with regard to Brick Architecture," which sets forth most of the important truths regarding brick composition. The illustrations are of the same excellent quality as the text, and include photographs of the interior court of the Certosa at Pavia, one of the most beautiful combinations of brickwork and terra-cotta in the world; of the Foro dei Mercanti, at Bologna, an admirable example of a street façade in pointed architecture; and scale detail drawings of the Ames Building, of Sever Hall, and of other noted recent brick buildings, together with the competition drawings above referred to, the most interesting of which is, perhaps, Mr. Van Straaten's design for a brick church. There are also special detail sheets of moulded bricks, and separate features such as windows, doors, cornices, etc., all carefully selected and of excellent artistic merit, and taken altogether the journal is one which is well-nigh indispensable to every architect who works with burnt clay products."

We doubt if any candid person at all acquainted with the tendencies of modern architecture will deny that the ornamental brick manufactured in America are miserably inadequate in point of design. Granting their mechanical perfection, almost all patterns of an

ornamental character must be crossed off the catalogues as out of the question for use, by every well-trained architect. This done, there remain a few plain and simple mouldings that are perhaps acceptable. Even these are thoroughly commonplace, made with rule and compass. The architects are responsible for this, and have none but themselves to blame. How many, when condemning the stock patterns, have shown any inclination to help the manufacturer to secure a better selection of designs? How many have offered any useful criticism, have suggested anything to replace the patterns they would throw out? Perhaps, when ornamental bricks were first made in this country, architects did not know they were bad in design. But that is no excuse for not doing their duty now. There is no question but that the manufacturers would do theirs. The man in charge of the large brick companies are men of high business ability, quick to see the financial advantage of manufacturing bricks acceptable to architects. They are sparing no expense to secure the best results, and the improvements in brick manufacturing show that it is on the artistic side only that they are lacking. Any advances towards co-operation on the part of the architects would be quickly met by the manufacturers, possibly excepting one or two who, through gross stupidity, consider their designs of the highest artistic character.

An examination of catalogues will reveal a striking similarity in designs. Perhaps this is due to all companies following the lead of some pioneer, a case of blind leading blind. But to a large extent this can be accounted for by the expense and trouble of obtaining original moulds, which has led to the smaller makers buying their moulds from the brick machine makers. There has recently come to us a mould catalogue issued by a manufacturer of a repress machine, in which we find all the patterns common to the majority of manufacturers. The machine maker evidently took his ideas from the first makers of ornamental bricks, and thus these unsuitable moulds are being distributed through the country, to the detriment of brick architecture. It is no more expensive to make good moulds than to make bad ones, and any organized effort on the part of architects would, we are sure, result in placing in the hands of all small manufacturers of ornamental bricks a set of moulds that would be of real use to the architects.

For some time we have been studying a plan whereby THE BRICKBUILDER, as an organ for the interchange of ideas between architect and manufacturer, striving to advance their common interests, could, with proper assistance from both sides, secure the general manufacture of a set of moulded bricks embodying the simple and fundamental mouldings. If by some definite action a series of designs could be agreed upon, as generally useful in ornamental brickwork, it would be a question of but a short time before these patterns would be supplied by all manufacturers.

We earnestly request correspondence from architects, in criticism of this plan, and hope that all who read this and have any interest in better brick architecture will give us the benefit of their ideas.

THE ILLUSTRATIONS.

Plate 73. Study for Business Premises, Ernest George & Peto, architects, London, England. Autograph Sketch, by Mr. Ernest George. This design was intended to be executed in terra-cotta, using facing slabs of terra-cotta for the wall surfaces in a manner that has become not uncommon in England of late years, and which has often been abused so as to produce an imitation of stone rather than an appropriate terra-cotta treatment. In the present case this defect has been, to some extent at least, avoided by the character of the design and the treatment of detail suggested, though much would depend, of course, on the way in which it was worked out. The design, as a whole, is agreeable in masses and well proportioned.

Plate 74. Detail of South Gables of Shiplake Court, Ernest George & Peto, architects. This is a detail of the gable seen in sharp perspective to the left of our supplement, which gives a view of one portion of this charming manor house, of which we gave a general view of the north front, with details of some of the brick patterns in our August number. To our mind this is one of Messrs. Ernest George & Peto's most admirable designs, and we have long regarded their buildings as among the best produced by English architects now living, and it is for this reason we have been at the pains to present a representative example of their work to our readers. As a suggestive and attractive little detail we would point out the combination of roughly squared flint stone with brick in the basement of the house, the same design being carried out in the fence wall shown in Plate 79. The house is situated near the river and commanding a fine view of it at Henley on Thames.

Plate 75. THE BRICKBUILDER Competition No. 4, fourth prize by J. T. Maclaren, Philadelphia.

Plates 76, 77. Elevation of the Banks Building, New York City, R. W. Gibson, architect, 18 Wall Street. This is a quite characteristic example of recent New York office buildings of moderate size referred to in the article by our New York correspondent, Mr. John Beverley Robinson.

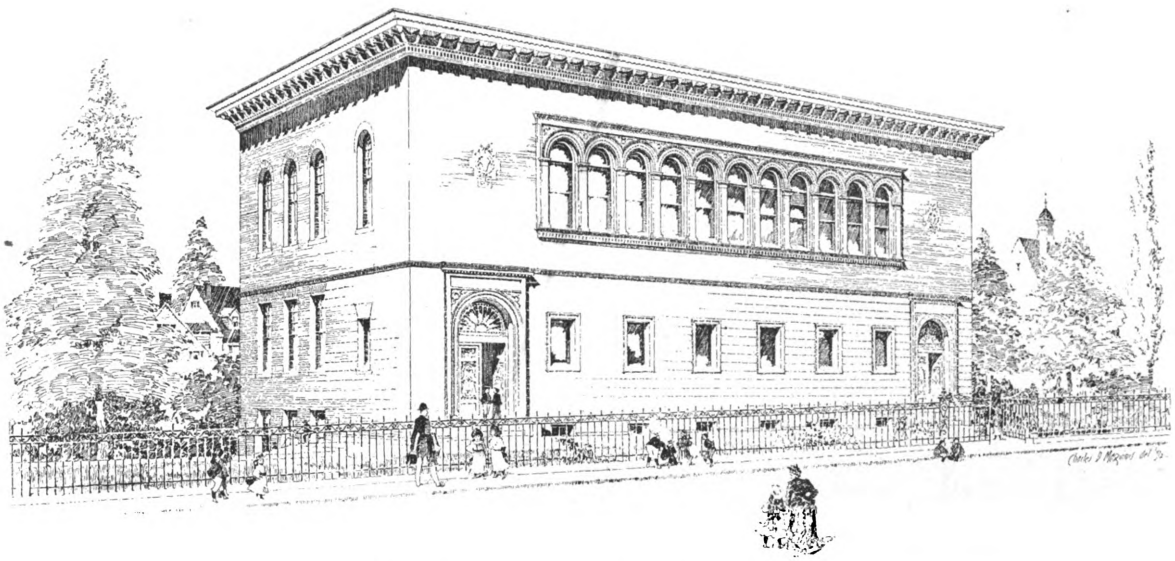
Plate 78. THE BRICKBUILDER Competition No. 6, first prize, Louis Sonntag, Philadelphia. Second prize, H. G. Fletcher, Boston.

Plate 79. Brick Wall and Gateway at Shiplake Court, Ernest George & Peto, architects, London, England. THE BRICKBUILDER Competition No. 6, third prize, Harry M. Warner, New York City.

Plate 80. THE BRICKBUILDER Competition No. 6, "Hors de Concours," designs by Will S. Aldrich, Somerville, Mass. These designs are better than any entered in competition, but were received too late. The second of these designs as compared with the third prize design shows a good, as compared with a poor, treatment of pilaster and supporting arch.

THE CENTURY CLUB, NEW YORK CITY.

This building is one of the later buildings by McKim, Mead & White, to which Mr. John Beverley Robinson refers in his New York letter, published in this number. We are indebted for the cut to the *Architectural Review*, which publishes scale details of the terra-cotta work.



PRIMARY SCHOOL, HAROLD AND HOMESTEAD STREETS, FOR CITY OF BOSTON. [EDMUND M. WHEELWRIGHT, CITY ARCHITECT.]

RECENT BRICKWORK IN BOSTON.

It would be difficult to find a more appropriate subject for the first of a series of articles or, rather, "letters," — for the writer will not attempt more than informal correspondence, — than the group of buildings which bear testimony to Mayor Matthews' wisdom in his appointment of a city architect. It is probably the first instance of an American municipality intrusting the erection of public buildings to a trained architect, acting as a regular city official, and the success of Boston's experiment will, we hope, induce other cities to follow her example.

Mr. Wheelwright's work has been spoken of in these columns before now, and some of his drawings have been published in the plate department of THE BRICKBUILDER, so that to most of my readers his work is not unknown. It is of particular interest to us, in that it seems to be the gradual working out of the problem of cheap, durable, and, at the same time, artistic building. It is true that thus far the work done has been largely of one type, but enough is now standing to demonstrate that the same principles can be applied to other types with similar success. In taking up the duties of the office, Mr. Wheelwright found a number of buildings in various stages of completion, and these he carried out according to the original plans and specifications.

The first work started by Mr. Wheelwright was the primary school at Orient Heights, East Boston, near Winthrop Junction. This schoolhouse is of simple design, well proportioned, with brownstone sills and a terra-cotta cornice very much larger than that of the Glen Road School, already published in this paper, but with detail much the same, lacking the "kick" which characterizes the later building. The bricks used in this and all other school buildings, except the Agassiz Grammar School and the primary school on Harold and Homestead Streets in Roxbury, are common red water-struck Eastern bricks. When the work is ready for estimates, a specimen brick is exhibited to the contractors, and the contractor securing the job is required to furnish a sample brick to match. This is retained in the architect's office, and is the standard by which the architect is to judge. In the Orient Heights School, the bricks are laid in white mortar, with thick joints, the basement being coursed off to give the effect of rustication. Almost simultaneously with the above, a primary school was started on Glen Road, Jamaica Plain, which has served as a model or type for several of the later school buildings. We have already published a perspective, Plate 9, No. 2, of this volume, and a plate of details in No. 6. On page 77 we give the first and second floor plans. This school is laid up entirely in Flemish bond, the first story being coursed by slightly recessing every sixth course. The basement and course lines are yellow or buff brick, and the whole building is laid in yellow mortar.

The cornice, the flat arches over the windows, and the window motive above the balcony, are of yellow terra-cotta brick. This school is practically the counterpart of the Glen Road School, differing only in the manipulation of the plan and a few trifling details.

Very similar to the Glen Road School is the B. F. Tweed school in Charlestown. At the corner of Bowe and Wyman Streets is a primary school, built throughout of common bricks, Flemish bond, red mortar, except at the levels of window sills and heads, where stretcher courses are laid in yellow mortar. Every one in seven courses is a header course, laid flush.

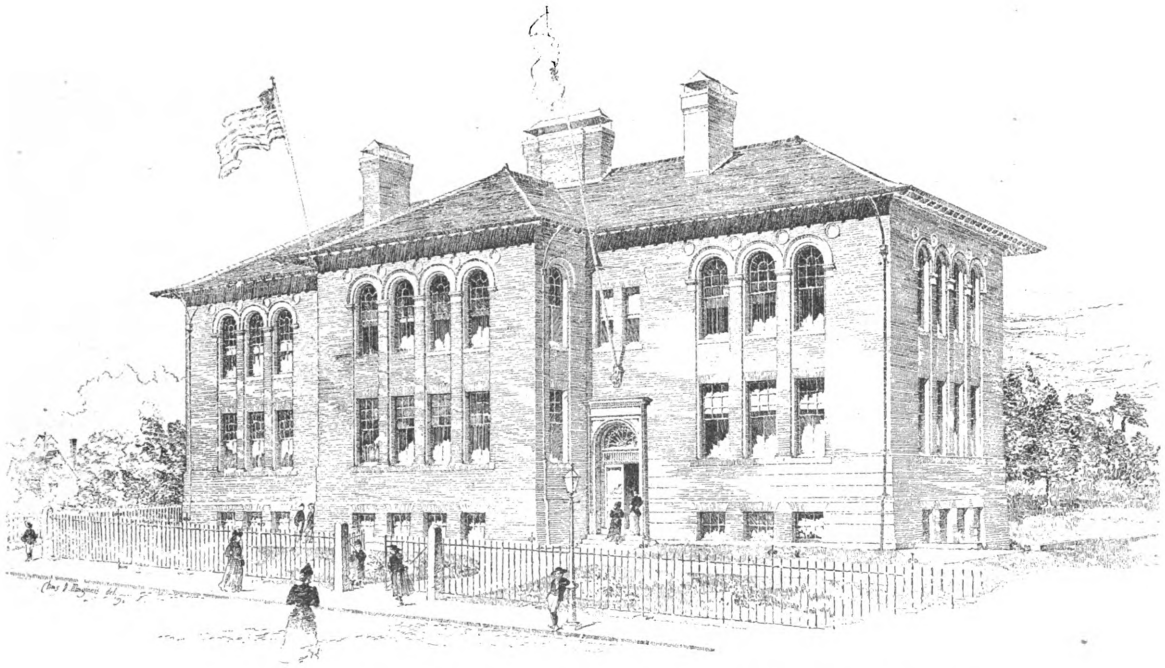
About the time the above was started, Mr. Wheelwright began the erection of an engine house in Andrews Square, South Boston. The appropriation was for a single house, but a double one was actually built, which, while not so interesting as some of the brickwork, is still a long way ahead of the previously existing engine houses. One of the most pleasing of the more recent buildings the city has erected is the Brighton Police Station, on Washington Street, in the Brighton district. A sketch is published herewith. It is of "Carteraig" Scotch fire-brick, upon a granite basement, the trimming being buff terra-cotta. The front porch is of wood. The effect of the entablature is exceedingly good, the cornice being well worked out, and the broad frieze being decorated with discs of rich Siena marble. Were it possible to do so in conservative language I would like to draw comparisons between this building and some of

the so-called "Romanesque" work, of which the City of Boston is the unfortunate possessor.

A building which has previously been published, and of which a reduced cut is given here, is the Fire Department Headquarters, which is to have a striking tower, frankly studied from that of the Palazzo Publico at Siena. This building is built of what is now known as the "Madison Square Garden brick," supplied by Mr. E. H. Thomas of Philadelphia. This brick varies in shade from a light or pale, to a warm, reddish brown buff, and is laid up without sorting, allowing the shades to vary as they will. It seems that the brick used in the Boston building present more variation in color and run to darker tones than those in the Garden. It was intended to have a terra-cotta cornice to match the brick in color, but the terra-cotta failed so completely to answer this requirement, that it was rejected and a brick cornice will be built. On this building there is considerable stonework, which is executed in Amherst stone. The pointed windows are arched by the Italian method, illustrated in Plate 5, color, one of the best of the recent buildings in the city. A dark red, terra-cotta brick, with trimmings an exact match, is used throughout the building save in the frieze, where a Southbridge brick, light red, is substituted. In connection with the detail in the February number, the use of various bonds and different colored mortars is fully explained so that there is no necessity for a description here. The discs that decorate the frieze and entrance are of Brescia marble, set in rings of red terra-cotta. The overhanging roof again replaces the cornice motive.

At Ashmont there is building an exceedingly interesting engine house, with a loggia feature in Amherst stone occupying the second story. And here again the overhanging roof is effectively used and the projecting rafters quaintly detailed. Very little attempt is made in this building to secure any effect in brickwork other than that of bonding. The Flemish bond is broken every fifth course by a course of stretchers.

In a primary school on East Third Street, So. Boston, we find Mr.



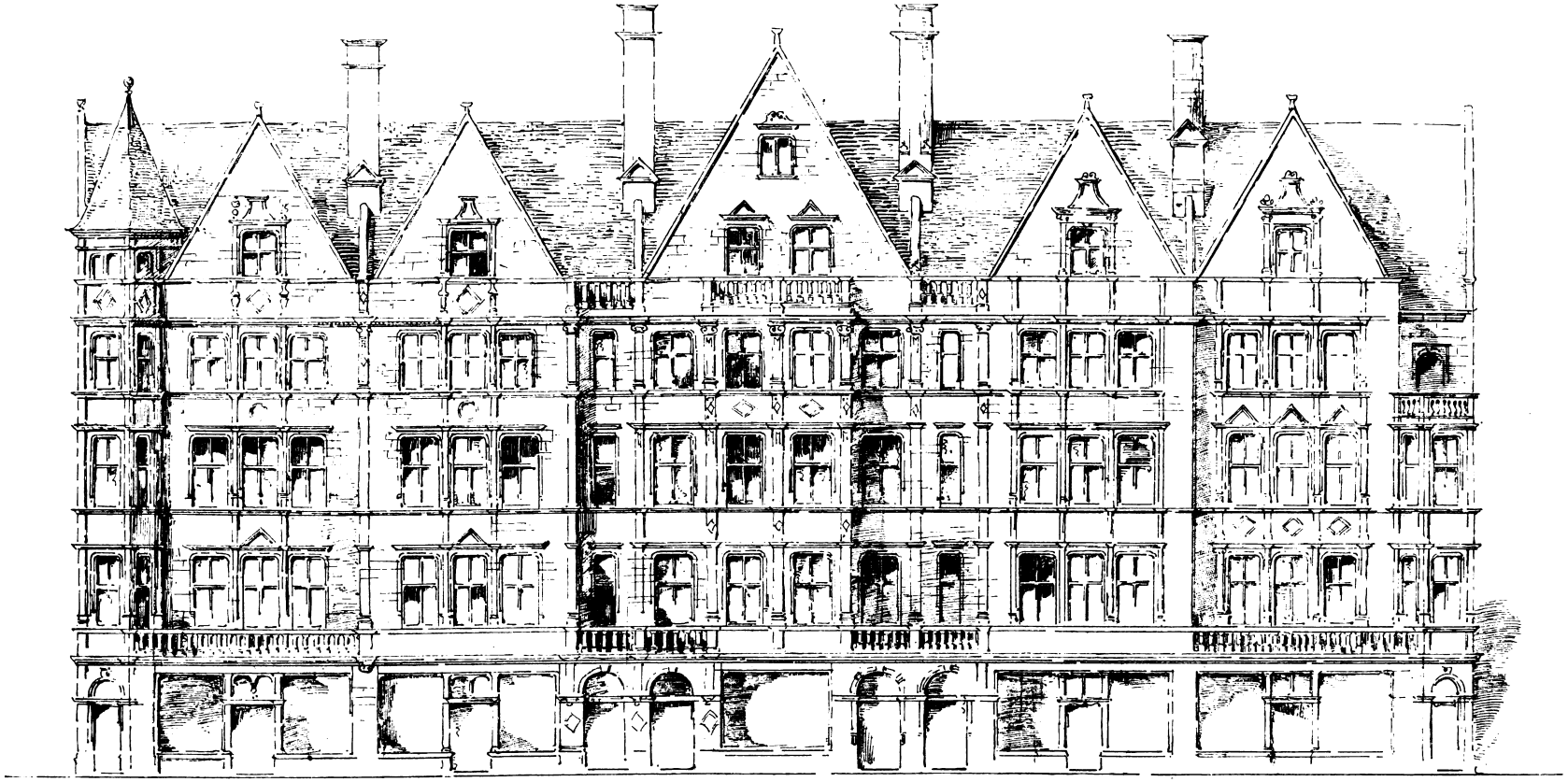
ROBERT GOULD SHAW GRAMMAR SCHOOL, FOR CITY OF BOSTON. [EDMUND M. WHEELWRIGHT, CITY ARCHITECT].

January of this year. The window openings are round headed, while the outer ring or label or voussoir have other centres, giving the effect of a pointed arch softened with its close connection with the round headed opening of the window.

One of the most charming buildings in the whole city is the primary school on Harold and Homestead Streets, of Scotch fire-brick and buff terra-cotta. The perspective is published in this number. The details are most carefully studied throughout, and will be published very soon in another paper — a fact which prevents my securing them for illustration here.

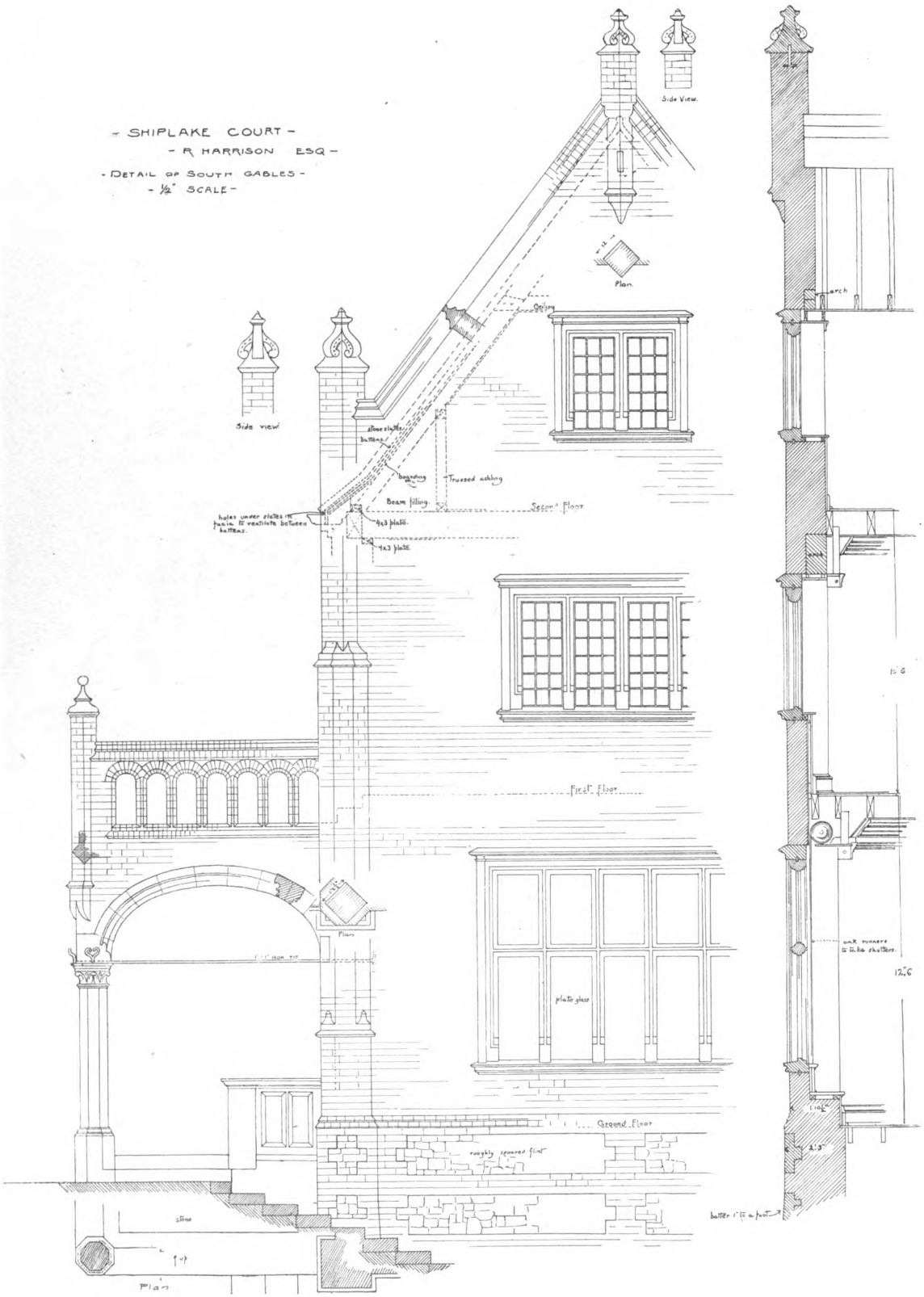
The Robert Gould Shaw Grammar School is the first building in which the overhanging roof appears and the brick cornice disappears. This is also illustrated by a perspective sketch. The building is laid up in red mortar, the trimming being pressed brick and terra-cotta. This building, in proportion to its size, cost the city less than any school yet erected here. The Agassiz Grammar School, of which details were published in the February number (Plate 6), is, in Wheelwright taking a suggestion from the charmingly proportioned little Court House (supposed to have been designed by Sir Christopher Wren) at Williamsburg, Va. The dark bricks are selected for quoins and trims, while in the arches to the windows, every other brick is white or very light in color. The white bricks, when carefully used, give the design that quality best designated by the slang word "kick."

I have attempted this time to run over the principal features of the work Mr. Wheelwright is doing for the city, that possesses particular interest in the line of brickwork. It is to be regretted that no process short of the most expensive of color processes will reproduce the three quarter scale drawings made in the city office; they are in every respect models of what such drawings should be. Besides the work above, there may be mentioned the Mechanic Arts High School, on Belvidere Street, close by the Back Bay Fens, a building in which the mill construction principle is followed; the Thornton and Fulda Streets school, which is essentially the same as



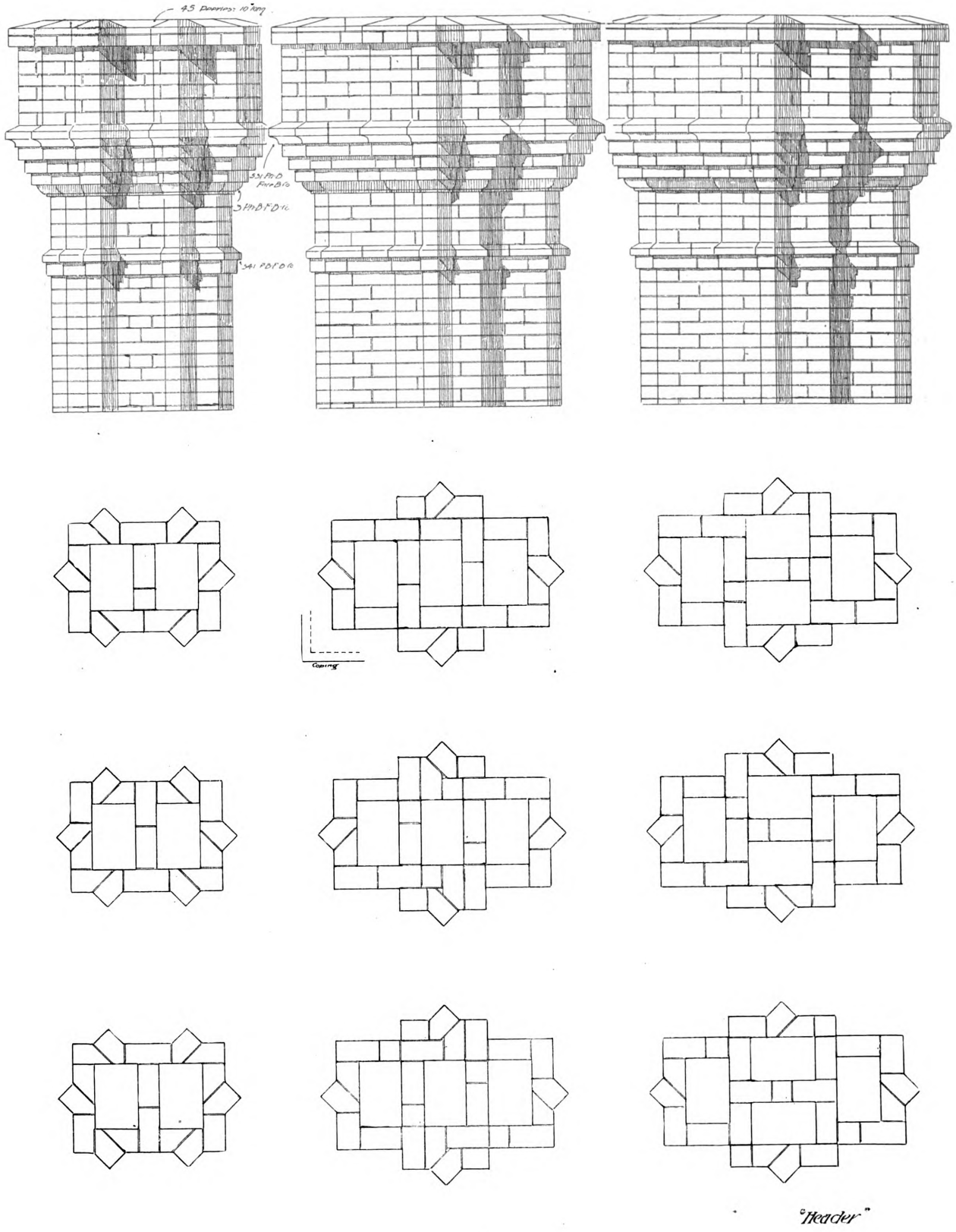
STUDY FOR BUSINESS PREMISES.

ERNEST GEORGE & PETO, ARCHITECTS.



DETAIL OF SHIPLAKE COURT.

ERNEST GEORGE & PETO, ARCHITECTS, LONDON.

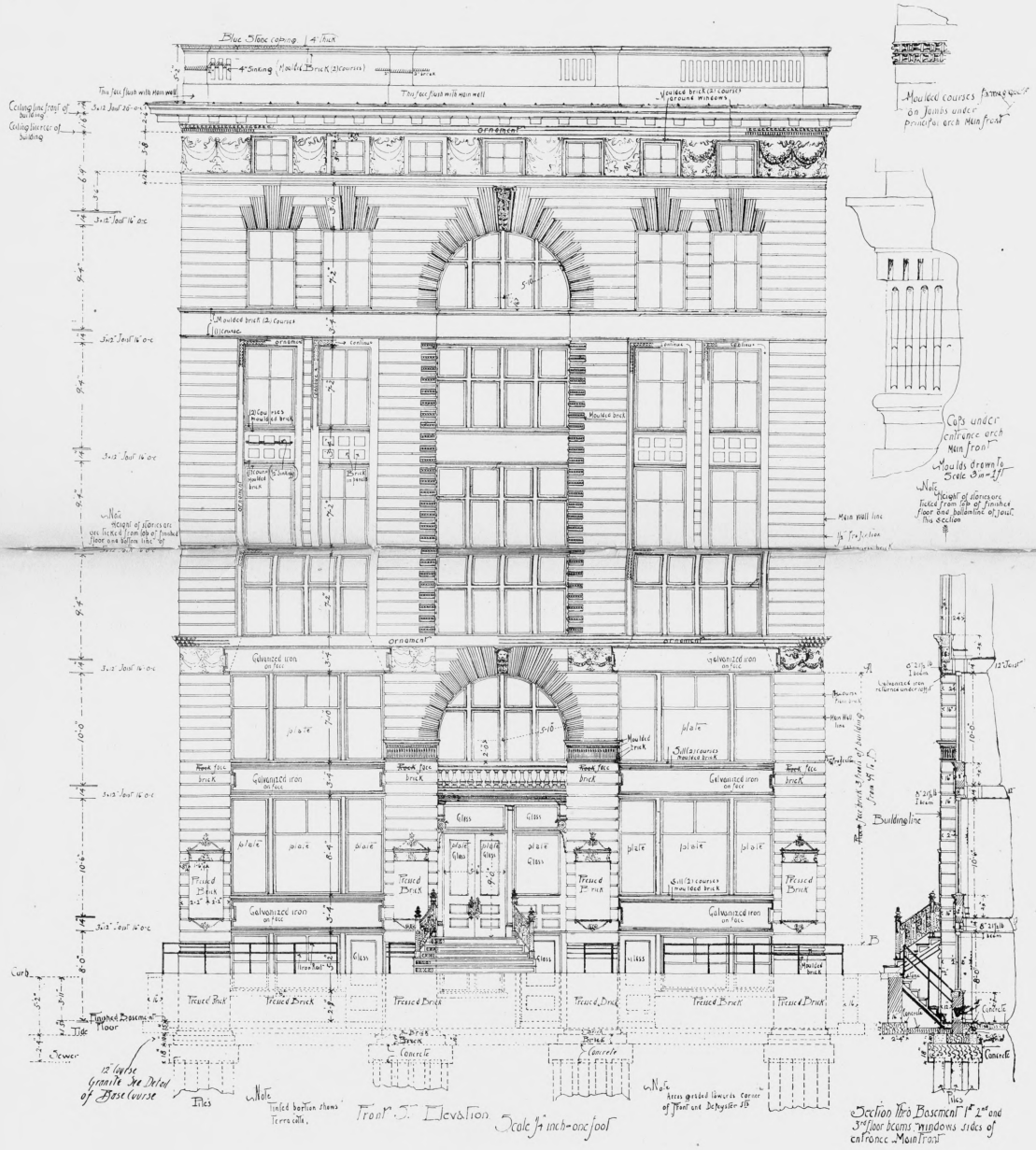


THE BRICKBUILDER COMPETITION No. 4.

FOURTH PRIZE.

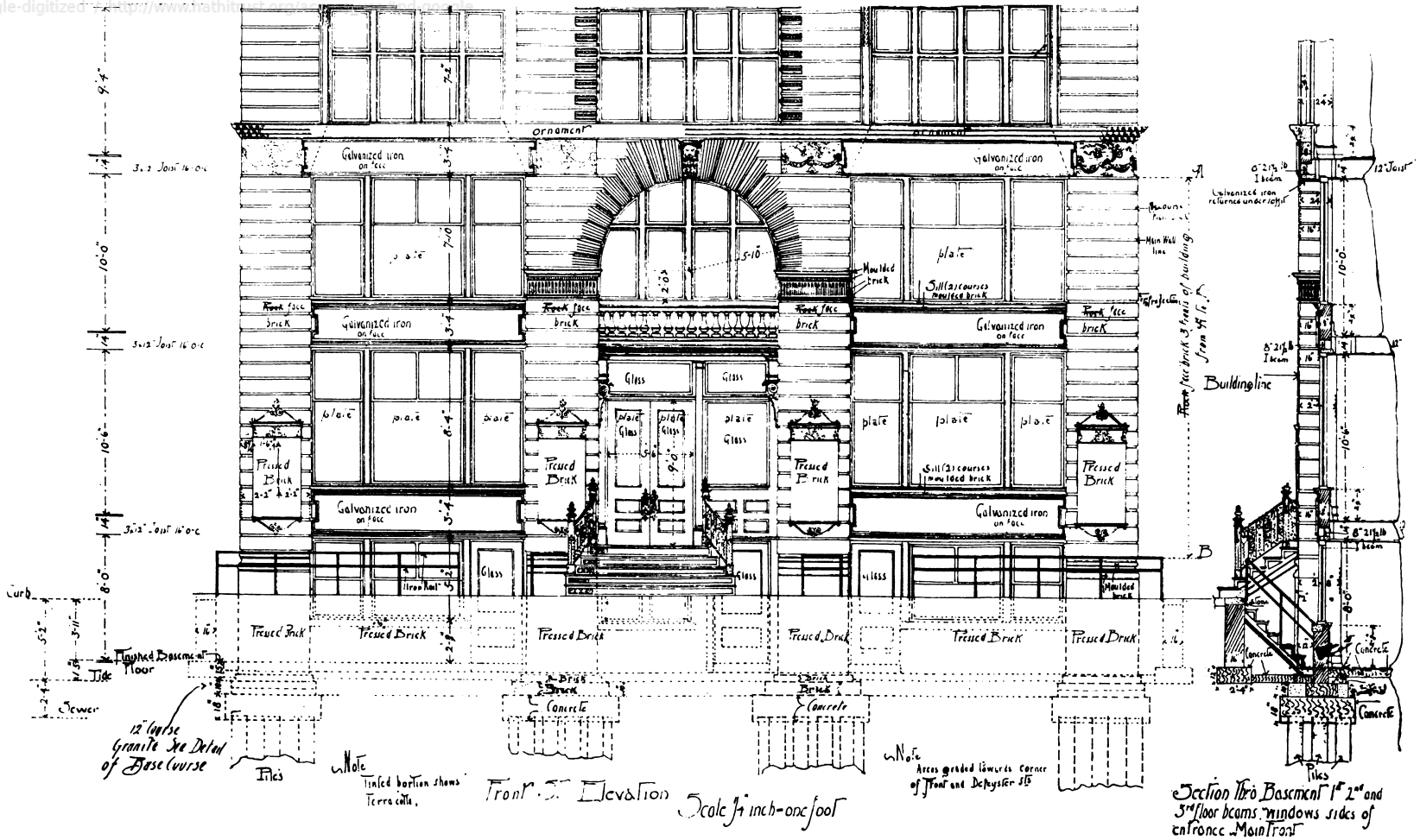
By J. T. MACLAREN, PHILADELPHIA.

BANKS·BUILDING·



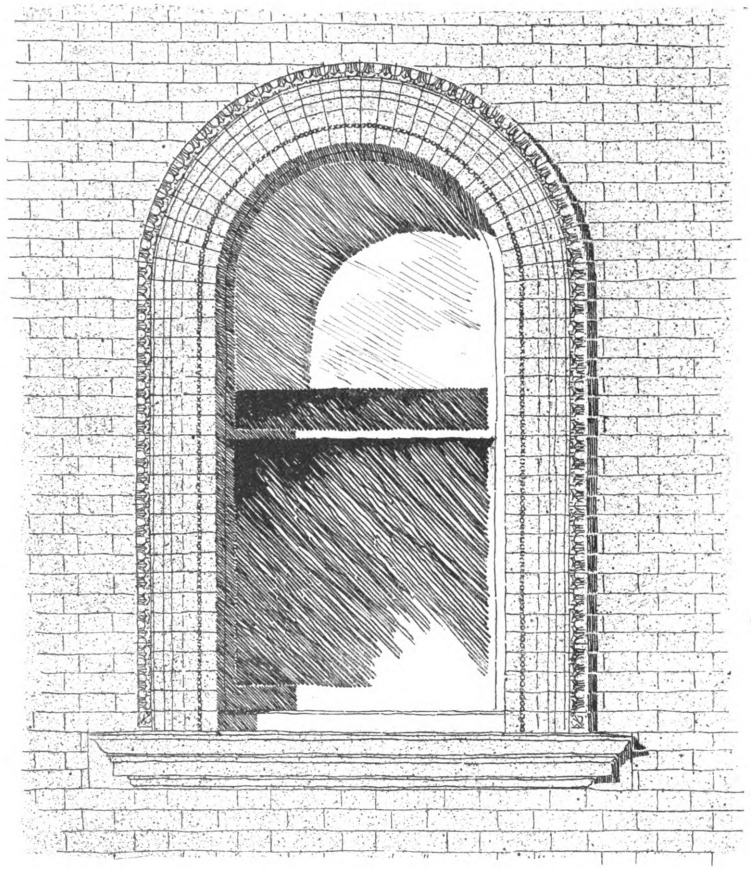
ELEVATION OF THE BANKS BUILDING, NEW YORK CITY.

R. W. GIBSON, ARCHITECT, 18 WALL STREET.

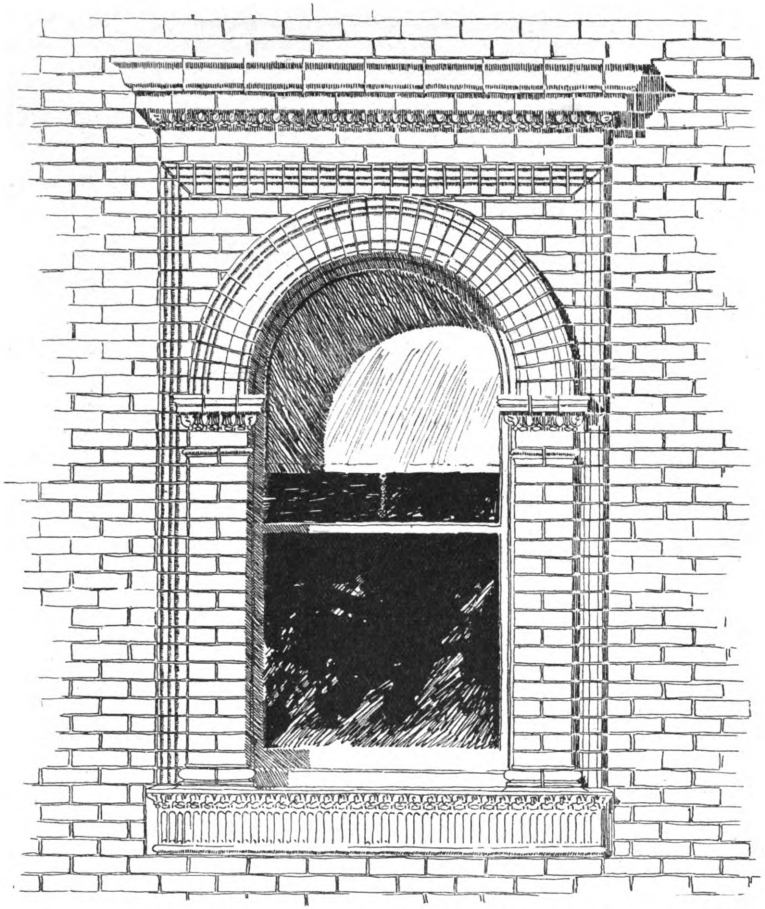


ELEVATION OF THE BANKS BUILDING, NEW YORK CITY.

R. W. GIBSON, Architect, 18 Wall Street.



Philadelphia and Boston
Face Brick Co.
Numbers 117-24-121.
Sill of Terra Cotta.

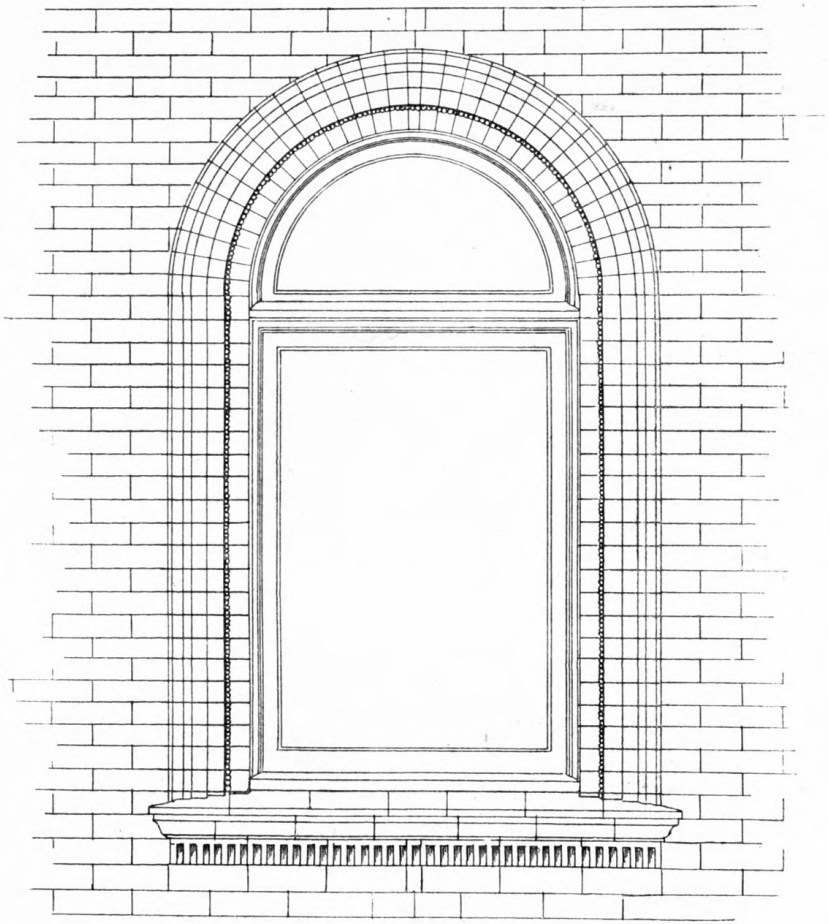


PHILADELPHIA & BOSTON FACE BRICK CO'S. NO'S. 5-10-16-22-24-25-117.
TERRA COTTA SILL

THE BRICKBUILDER COMPETITION No. 6.

"HORS DE CONCOURS" DESIGNS.

By WILL S. ALDRICH, SOMERVILLE, MASS.



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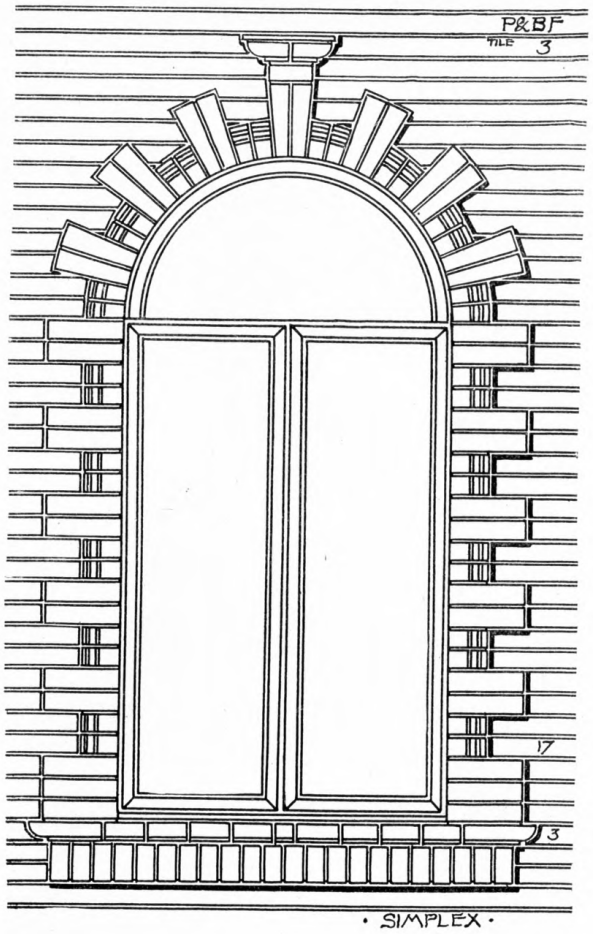
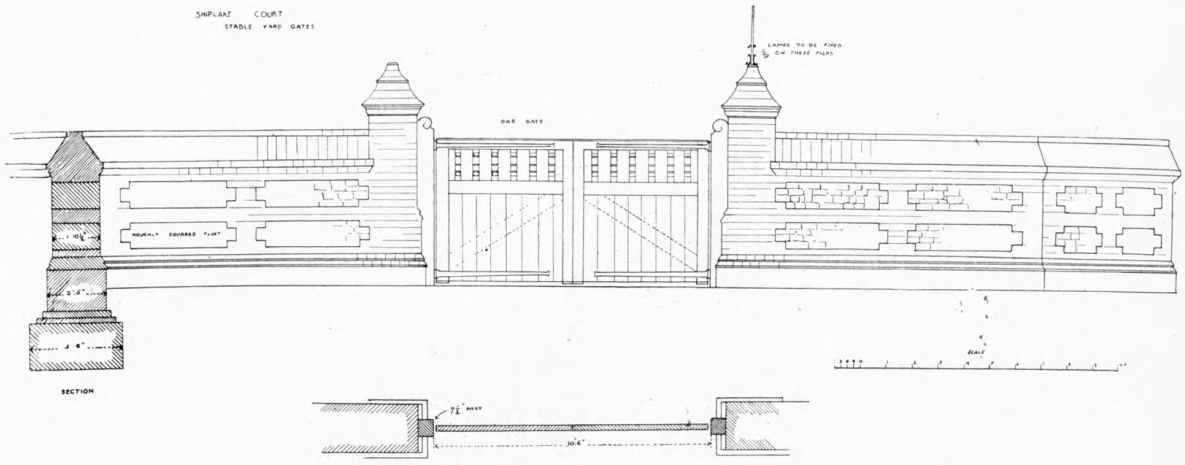


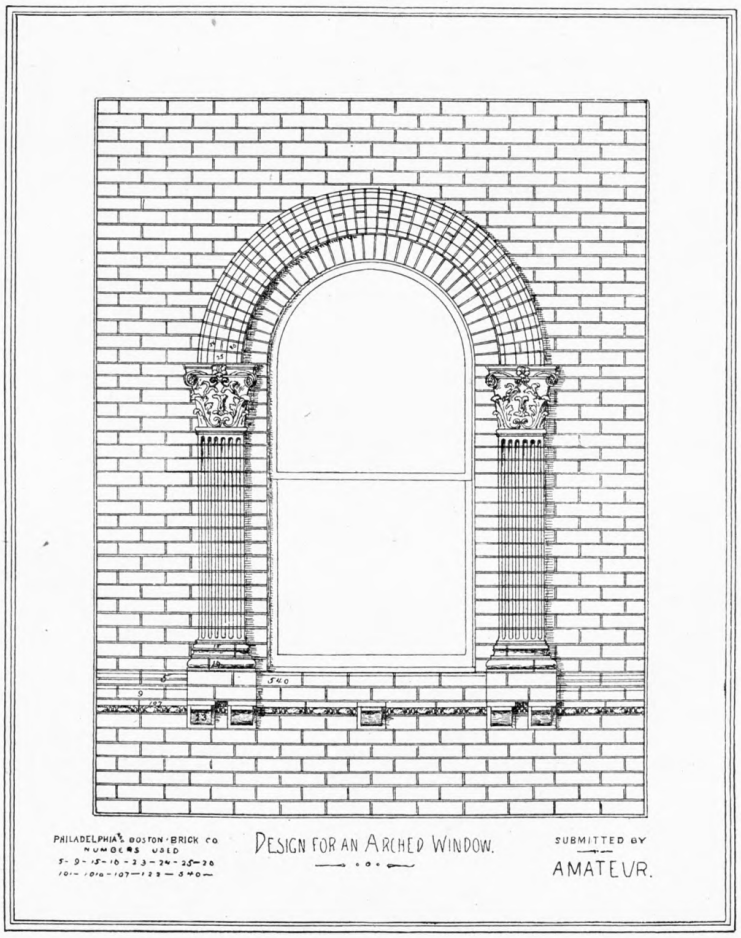
FIRST PRIZE. LOUIS SONNTAG, PHILADELPHIA. SECOND PRIZE. H. G. FLETCHER, BOSTON.

THE BRICKBUILDER COMPETITION No. 6.



BRICK WALL AND GATEWAY AT SHIPLAKE COURT.

ERNEST GEORGE & PETO, ARCHITECTS, LONDON.



THIRD PRIZE. HARRY M. WARNER, NEW YORK CITY.

THE BRICKBUILDER COMPETITION No. 6.

DESIGN FOR ARCHED WINDOW.

POLICE STATION, BRIGHTON, FOR CITY OF BOSTON. [EDMUND M. WHEELWRIGHT, CITY ARCHITECT.]

that on Bowe and Wyman Streets; the Austin Primary School, Decatur Street, East Boston, which is of the same type as the Robert Gould Shaw School; the addition to Police Station No 13, and the City Hospital stables, interesting from the treatment of gables used.

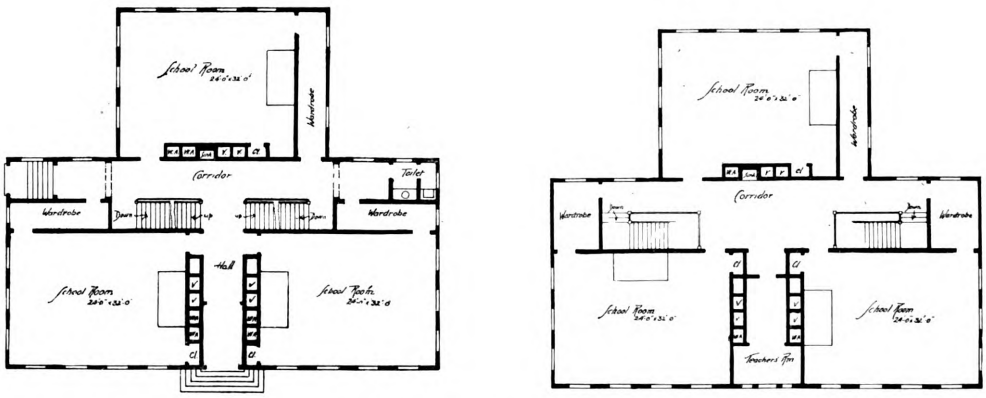
It will repay any student or any apostle of better brick architecture to make a visit to each of the buildings I have mentioned, as they represent the development of a simple, logical, and characteristic style of brickwork that promises well for the city work.

In another letter I will endeavor to describe and illustrate some of the admirable brick and terra-cotta work being done in mercantile architecture in Boston. Some of the older examples have been published in this paper, but one sees plenty of new material on all sides, and, what is encouraging, the larger portion of it is worthy of notice.

"PURITAN."

A DOUBLE NUMBER.

The November and December issues of THE BRICKBUILDER will be combined and issued under one cover. The primary reason for so doing is to more satisfactorily present the results of our competition for designs of a $2,000 brick house. Twenty-six desisns have been submitted, and we wish to publish at least eight of these at once. As each design requires two plates, it will be necessary to double the usual number of plates. We can promise an exceedingly interesting number, with cleverly studied designs and carefully worked-up details. This number will be sent to any address for fifty cents in stamps, or to new subscribers whose names are received before Jan. 14, 1893, it will be sent free. Those sending fifty cents can, if they prefer, let their subscriptions date from this number, in which case the fifty cents will be credited on the subscription.



FIRST AND SECOND FLOOR PLANS OF THE GLEN ROAD SCHOOL.

RECENT BRICKWORK IN NEW YORK.

Of recent brick buildings in New York it may be briefly said that some hundreds, or some thousands, have been built, out of which a half-dozen, possibly a dozen, are worthy even of criticism; the rest, artistically speaking, might better have remained unbuilt. Fancy fronts, the speculative man calls them; more the style, he thinks, than the old style brownstone. Accordingly, he builds his hideous jumble of ungainlinesses, not even striving for beauty, striving only to make something "handsome"; that is to say, ostentatious, well knowing the bent of mind of his customers, and achieving the pieces of vulgar pretence that make the present the most hopeless age for architectural art of all the ages that have been.

Taste! you venture to suggest? No disputing about tastes, you say? For such is the demand, for such demand the builder must build. It is indeed irrefragable this old apothegm.

Gladly I admit the undeniable. There indeed is no disputing about tastes; no doubt at all that, to the taste of the vulture, carrion would be more acceptable than any delicacy which the great Vatel could concoct. By their tastes, as well as by their fruits, are men distinguishable.

Uptown there has been going on one of the biggest house-building performances known. Block after block, each block six hundred and odd feet long, of carefully and skilfully designed brick houses. Each block the work of a different designer; each designer picked from among those of highest standing.

Near by are more blocks, built solid, in the same way, by one who knew the stuff of which New-Yorkers are made. This man stuck to the old type. High stoop, brownstone (h. s., b. s.), as the real-estate dealer briefly puts it. Commonplace to an indescribable degree; copied, in fact, as literally as possible from existing houses. Perpetrated deliberately, too, by a man who knows what good design is, but who is outspoken in saying, "People don't want good design; people like bad design. It is not for me to cultivate high art, nor to elevate the tastes of the masses. My business is to build houses that will sell."

They did sell, I am told. Outsold, two to one, the well-designed ones, justifying the opinion and filling the pockets of the builder. The cleverly designed houses still hang fire.

That is why I am moved to denounce (yet why should I denounce?) vulture tastes.

Denunciation will not mend his taste; nor ought we to expect the buzzard to like *sauce piquante*, nor count it blameworthy in him that he does not.

Ostentatious vulgarity or sheer reckless ugliness, that describes the most of buildings nowadays built.

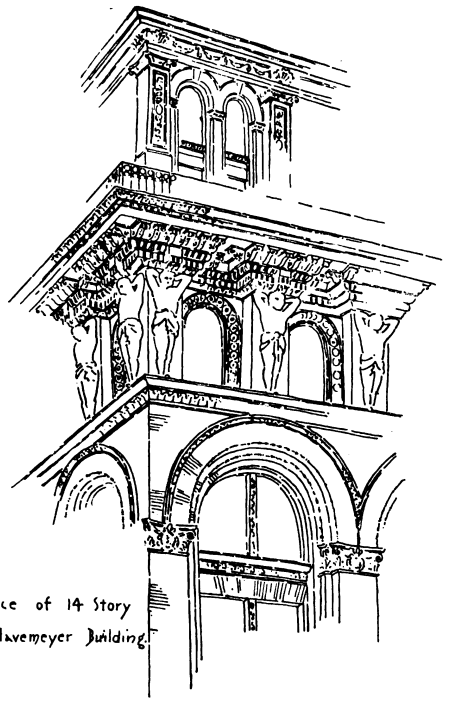
Of the remaining few that were built with some notion of making them beautiful, and that, therefore, challenge thoughtful admiration, criticism, there might be much said in praise or in blame. In all of these, however, one fact asserts itself, that they have been built by architects who knew what was beautiful and desired it, but who knew also that their audience neither knew nor desired beauty. Each one represents a struggle.

Take, for instance, the big Havemeyer Building, by Geo. B. Post. An eminently good building, all of brick with terra-cotta; plain below, unassuming, matter of course, suited to the heartachy affairs called "business" that go on behind its bricks. On top a cornice, beautiful in itself and solving a problem in design in a way to delight the initiated. The problem was to make a cornice somewhere near big enough for the fifteen or eighteen story building that it crowns; to make a cornice story-high, if possible.

It has been done here in a masterly way. Great Carians, white, or, at least, cream-white terra-cotta figures, stand one between each window, bearing upon their heads and Atlantean arms a classical cornice, which breaks around each figure, all except the crown-mouldings, which are continuous. This breaking around of the bed-mouldings is what makes this cornice what it is. At the immense height at which it is seen, Carian and block of bed mouldings merge together into an enriched bracket-shaped mass, strong enough to be well seen as a cornice, notwithstanding the mass of building below.

One of the best things ever done in the way of cornices in all time, without a doubt.

I said crowned. Crowned it ought to have been, but crowned it is not. Two more futile, unnecessary stones are piled up above it, announcing as plainly as possible that they were added after the building was determined.



Cornice of 14 Story Havemeyer Building.

After-thoughts conspicuously repugnant, no doubt, to the architect as much as to the critic; sacrifices to "shent per shent," with no thought of Aphrodite Ouraneia.

Then there is a whole group of McKim, Mead & White buildings, almost all of a type, buff and white, or buff and a paler buff. Enriched quoins, alternating with plain, or the quoins extended into enriched bands across the whole of a story or two, or even throughout a façade.

Exceedingly good work they all are, yielding to the demand for ostentation what must be yielded, but retaining such delicacy and, withal, real beauty, that sincere admiration cannot be refused. Most of all must we admire the good fortune of architects who are strong enough, socially and financially, to have their own way and dismiss the client's crude notions with the little consideration they merit.

First among this group is the much written about Madison Square Garden, then there is the Imperial Hotel (is not the very name a corroboration of what I have been saying?), the Judson Memorial Church on Washington Square, the Yosemite apartment house, and an atrociously overloaded building at the corner of Broadway and 22d or 21st Street, I forget which. One of the blocks of houses spoken of above, and the best of them, is by the same architects, more in their earlier, quieter, and, to me, more pleasing manner.

Up in 58th Street, — absurd nomenclaturė, not a nomenclature at all in fact, and to a foreigner laughable, though we are partly used to it, — up in 58th Street is quite the most beautiful brick building that I know of, a steam building by W. C. Hazlett, a steam heating company's "plant," difficult plant to breed fair flowers upon. Indeed, when I say beautiful, I mean το πρέπον not το καλον, the eminently suitable, with what may be of grace skilfully added, not the supreme embodiment of joy which need not be looked for anywhere when such Fescennine choruses as "Ta-ra-ra-Boom-de-ay" are our notion of the musical expression of joy.

Then there are some buildings of a few years past, built, some of them, before the "recent revival" of architecture, but good, notwithstanding, and the more praiseworthy as good work then was rarer. Among these first and foremost the Racquet Club Building at 6th Avenue and 26th Street, than which there is not a more carefully thought-out and original design.

At random, too, I think of the Manhattan and other storage warehouses; Ware, the architect of one, the architect of the other I have not learned; an admirable warehouse on Hudson Street, the architect of this also unknown to me. One or two good armories to keep down the populace, we having recently acquired a "populace" among other acquisitions, and some other buildings, of all which in due course I hope to send you some report.

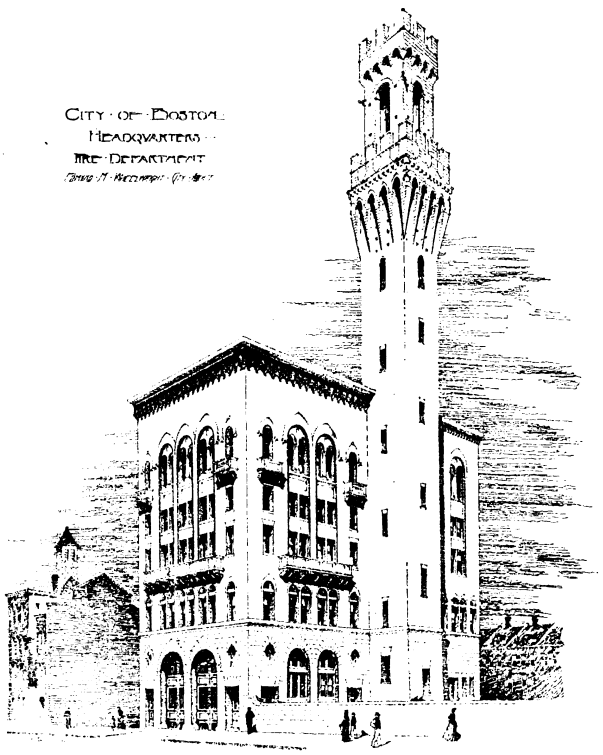
JOHN BEVERLY ROBINSON.

67 Liberty St., New York, 23 August, 1892.

BRICKS AND JOINTS IN BRICKWORK.

From *Building News*. — (Concluded.)

For engineering works and heavy structures stocks of the harder kind are necessary. These, when broken in two, should present vitrified sections right through the length and thickness of the brick. These kinds of bricks are generally found in the heart of brick clamp, or towards the leeward side of the clamp, in which places the heat has been the greatest. A clamp of bricks often indicates the direction of wind and weather during the time of its burning, the "place" and softer bricks being found on the weather side. There is no kind of brick in the London market which, for durability and general all-round purposes of construction, bears a better character and record than the much-used London stock. For exterior work it seems capable of withstanding the varying vicissitudes of all weathers with no appreciable effect. For interior work, where plastered, it affords a better clinging surface than any other kind of brick; is capable of resisting enormous crushing weights (when thoroughly vitrified); and when built with well-wetted bricks thoroughly flushed up will knit together, acquiring a degree of toughness to an extent which no other kind of bricks seem capable of acquiring when built together. The attribute of toughness seems in some cases to be overlooked when scientifically testing the strength of material — a fact brought out by Messrs. Mowlem and Burt in the present year, when contesting the result of one of Kirkaldy's tests with respect to the durability of road metalling, a report of which appeared in the *Building News*. The attribute of toughness in stock brickwork presents itself in old foundations during their structural alteration or removal more than in any other part of a building.



For some few years past the London stock proper has had a rival in the brick market in the shape of the Fletton brick, advertised as a superior stock brick, the interior work of the General Post-Office now building being of these bricks. The first quality of Fletton bricks are unquestionably good, well-finished bricks, possessing the qualities and characteristics in make peculiar to most pressed bricks, viz., density or compactness of structure, weight, sharp, well-defined arrises and well-finished faces, combined with truthfulness of form. These bricks, like most others, vary much in quality, the inferior kinds being known to the practised eye by a condition which in the ordinary London stock brick would be described as "shuffy," derived from the word "shuff," applied to the most inferior class of bricks produced by clamp-firing. The Fletton brick, however, being made under entirely different conditions to that of the ordinary stock, and being kiln-burnt instead of clamp-burnt, is much above the level of the "shuff" proper found in stock bricks. The edges of such of the Fletton bricks are broken away, the beds of the bricks having a general appearance of a want of cohesion, and when broken in two presenting a loose and frequently a cracked section, showing the bricks to be made from a strong, refractory clay, which, in such particular instances, has not been sufficiently pugged, and evidence of which, in the shape of core or stones, is sometimes found in these bricks. The writer has known instances of core in some of the best clays breaking the shafting of the pugging machine during the process of tempering the clay. Mr. Kirkaldy has reported very favorably of the Fletton brick with respect to its resistance to crushing; but for exterior facings, as compared with stock bricks, it has the disadvantage of not having been in use sufficiently long (at least, in the Metropolis) for an opinion to be safely expressed as to its weathering capabilities. It is well suited for interior facings intended for distemper; but for plastered walls its smooth face, the result of being pressed in a metallic mould, does not afford the same amount of clinging surface or "key" for the plastering as an ordinary London stock brick. It may be said that the rough cut mortar joints over the whole area of the wall afford sufficient "key" to uphold the wall plastering in position, irrespective of any adhesion on the faces of the bricks. In cases of this kind it is safest to judge by comparison. Fletton bricks are cheaper than good London stocks, and take less mortar in building, a consideration which accounts for the London builder being an ardent advocate of their use.

Some specifications provide against the use of bats in the walls unless occurring as legitimate bond, which practically means the exclusion of the use of bats, the cases in which they would be required as legitimate bond being few indeed. The clause may also be understood as one of these conditions or guards with which the architect finds it necessary to hedge himself about when dealing with the modern competitive builder, in some instances remarkable for his astuteness in finding out the weak points of a specification, and bringing his sharp practice to bear on them with a view to prospective extras as a means of pulling him through on a low-priced bill of quantities, and whose idea of building seems to be the throwing together of so much crude or wrought material, as the case may be.

The quantity of bats in a freight of bricks is generally a good criterion as to their hardness, provided the bricks have been loaded fairly from the clamp; that is to say, taken fairly as they stand without sorting. The softer bricks get very much broken in the different operations of handling in transit to the job. Another surer sign of soft inferior bricks is the great amount of brick dust present in the bottom of the cart or boat when unloading the bricks, due to the attrition of their soft faces, good, hard bricks making little or no dust; a large amount of dust present at once exciting the suspicion of the practical man as to the quality of the bricks. In a recent case at law in connection with the roofing-tile trade it was

contended, and ultimately ruled, that 2½% of defective tiles is the recognized maximum quantity allowed in every freight. A similar rule, by tacit acceptance, we believe applies to the quantity of bats in a freight of bricks — the maximum proportion being two bats to every four unbroken bricks — or, using a term of the trade, two bats to every "hand of bricks," the bricks, for convenience' sake, being handled five at a time, the two bats counting as one brick. In this way 80% of whole bricks are obtained. The use of bats is often a vexatious question, and the cause of much friction on the building between the representative of the contractor on the one side, and the representative of the architect on the other. A practice of the writer in the supervision of brickwork is not to object to the use of bats if three whole headers intervene between every two bats. by which arrangement 75% (seventy-five per cent) of the heading courses are whole bricks. But with every alternate header a whole brick, no danger need be apprehended under ordinary circumstances of building, provided the work be well flushed up every course, for brick walls are seldom, if ever, found to fracture longitudinally for two reasons, viz., that fractures in brickwork are, as a rule, due to defective foundations, which defects generally show themselves in a direction transverse to the wall; and that the longitudinal bond or lap of the brickwork is only 2¼ in., while the transverse bond or lap is 4½ in. The weakness of a wall, and of its foundations, is in a line at right angles to its line of direction, or the line in which the least resistance to fracture is offered. Large walls and piers are too often regarded by the builder as legitimate receptacles of the smaller material of building — an idea not alone peculiar to the bricklayer, nor to present day practice, but one also held, in some instances at least, by the mediæval builders, who built their great hearts into the sculptured stones, and evidence of which may be seen in the remaining ruins of St. John's, Chester, and in the account of the survey of Peterborough Cathedral by John L. Pearson, in which he assigned the dangerous condition of the tower to be due to the fact that the great piers were little better than cased masonry filled in with rubble or unbonded stones.

LIBRARY ARCHITECTURE.

The American Library Association is preparing an exhibit for the World's Columbian Exposition at Chicago, under the auspices of the United States Bureau of Education. A prominent position in the exhibit is to be assigned to Library Architecture. The purpose of this department will be twofold. On the popular side it will serve to call public attention to the architectural importance and significance of libraries; and to suggest to communities and to individuals the erection of library buildings. For this purpose large and effective exterior views or models are particularly desired. On the professional and technical side it is intended to show the development and present state of library science, as regards the adaptation of the building and its equipment to the practical purposes of a library. In this direction more importance attaches to floor plans, sections, and interior details than to exteriors.

Trustees, librarians, and architects are invited to send for exhibition drawings or photographs of existing or proposed library buildings or rooms, whether built for the purpose or altered from premises intended for other use. While it is earnestly desired that the large modern libraries should send full sets of plans, it is equally to be hoped that the older and smaller libraries will contribute; for most of the libraries of the future which will derive benefit from this exhibit will be of moderate size and means.

Librarians and trustees are asked to send, with their plans, suggestions as to merits or defects which have been developed in use.

Architects who are preparing plans for library buildings, or who have submitted plans in recent competitions, are invited and urged to send them for exhibition, inasmuch as any carefully matured plan, even if not adopted, may contain features of practical interest to librarians.

If plans are prepared expressly for this exhibition, it is recommended that they be made on a scale of ⅛ inch to the foot, and rendered with India ink. The largest frames on which the plans are to be displayed will be 28 inches high by 40 inches wide, so that plans should not exceed that size. Many of the frames will be only 22 x 28 inches, and this size of plan is preferred by the Bureau of Education.

The plans and models contributed will be arranged and displayed as effectively as the available space will permit. After the Exposition, they are to form part of a permanent library exhibit. If the contributors are unwilling to part with their drawings for this purpose, it is hoped that photographic copies may be permitted.

The Library Association of the United Kingdom has promised thirty or more representative plans of English and Scotch library buildings, and if the American collection can be made thorough and representative, the combined exhibit will not only be very useful to those interested in library administration, but it may also serve to stimulate and encourage the building of libraries in all parts of the United States.

Notification of willingness to send plans should be sent at once, and the plans should be forwarded (flat), as early as possible, to C. C. Soule, 15½ Beacon Street, Boston, Mass.

For the Exposition Committee of the American Library Association: Charles C. Soule, *Trustee*, Brookline Public Library; Samuel S. Green, *Librarian*, Worcester Public Library; George W. Harris, *Librarian*, Cornell University, Sub-committee on Architecture.

December 1, 1892.

We would suggest to the manufacturers a possible application of the electrotyping process to the manufacture of moulds for ornamental bricks. Perhaps the idea is already an old and discarded one, but we have never heard of its being tried. As many know, the process of electrotyping consists of making an impression in wax, on which a coating of copper is deposited by means of electricity. This coating or film is then backed up by a base of softer metal. In making a brick mould, a plaster cast of the mould would have to be first made from the model of the brick. From this cast a wax model of the brick could be taken. On this the copper film would be deposited, removed, and backed up, giving an absolutely perfect mould of the model. Possibly the use of this process would be more expensive than the present mode of making brass moulds. It is offered as a "printer's" suggestion, for what it may be worth.

CORRECTIONS.

The first plate in the September number, a brick fireplace, submitted in competition by "One Year Cub," was designed by Mr. S. E. Gideon, Louisville, Ky. By some slip, Mr. Gideon's name did not reach us with his design, and, consequently, he could not be given due credit at the time of publication.

By a misprint the supplement of our September number — the clock-tower of Hampton Court Palace — was entitled "Church Tower," which, of course, it is not, but simply a gateway tower.

CORRESPONDENCE.

46 Eagle St., Albany, N. Y., Nov. 27, 1892.

To the Editor of The Brickbuilder.

Dear Sir, — I have read your article on page 66 about terra-cotta, and I fully indorse all you say. To reproduce stone forms in terra-cotta would be beneath contempt if there were not some excuse; in the fact that it is extremely difficult to obtain any information as to how it ought to be treated, I have vainly hunted for any work on the subject; and if you would devote say a page each month to giving information on the designing in terra-cotta, etc., you would doubtless oblige others besides, yours very faithfully,

With Edw. Ogden & Son. Arthur Clapton.

Elyria, O., Nov. 27, 1892.

Editor Brickbuilder, *Boston, Mass.:* — Shall build next season and intend to finish inside walls of kitchen with some kind of vitrified glazed brick or enamelled brick so that the walls can be easily cleaned. Should like your opinion on this subject in the next issue of Brickbuilder, stating kind of material to use.

Very respectfully, P. D. Reefy, M. D.

Hartford, Conn., Nov. 14, 1892.

The Brickbuilder Pub. Co., Boston, Mass.

Dear Sirs, — Can you give us the names of any firms making moulded brick of the same stuff that common brick is made of?

Respectfully, Cook, Hapgood & Co.

The Brickbuilder, *Boston:* — Gents, can you inform me where I can get a book or information regarding the material and formula for mixing different colored mortars, also for cleaning down brickwork, and other points necessary?

Very respectfully, C. C. Buck.

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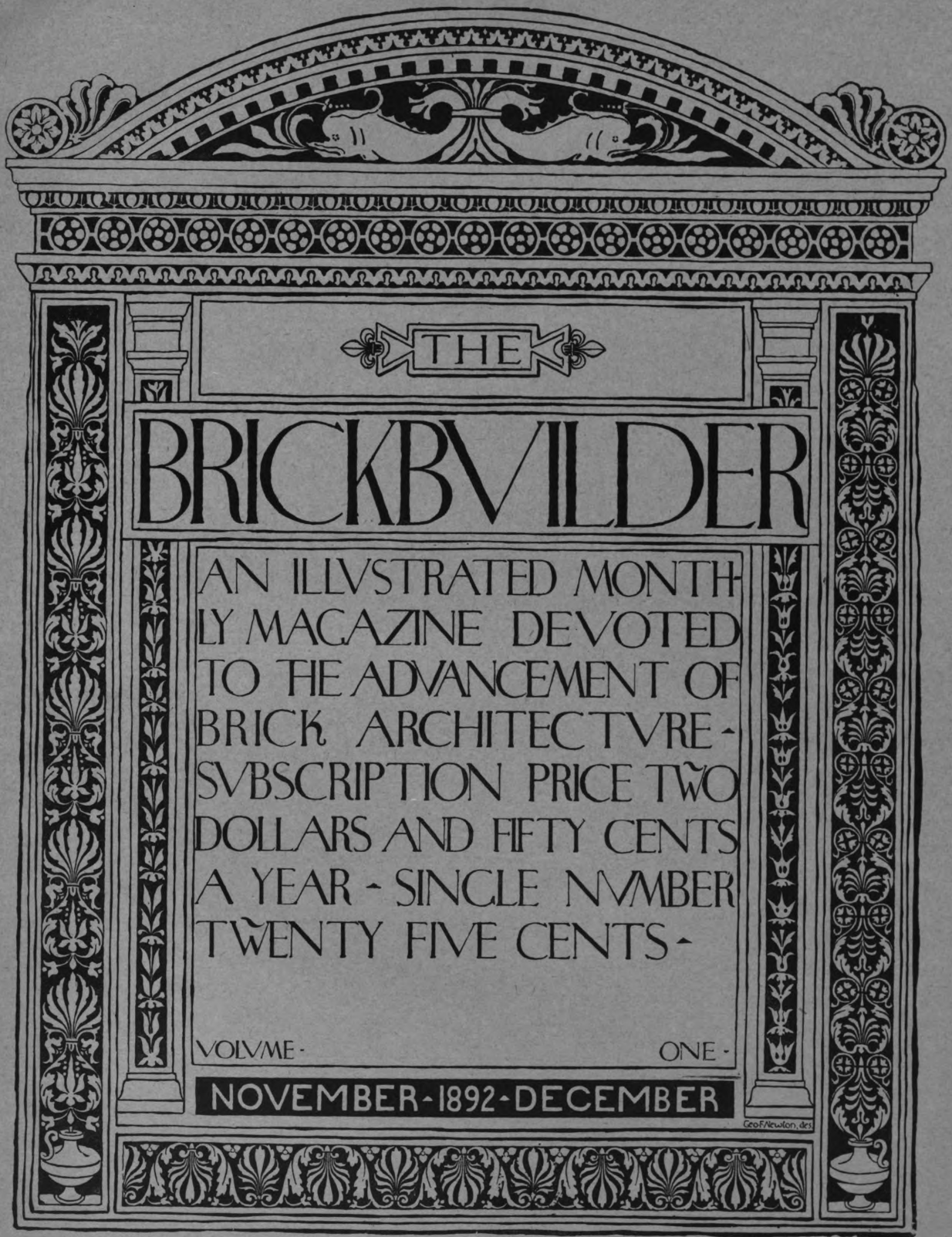

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The Brickbuilder.

VOL. I. BOSTON, NOVEMBER AND DECEMBER, 1892. Nos. 11 and 12.

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF BRICK ARCHITECTURE.

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There is, perhaps, no practical question which just now is of more importance to brickmakers and designers of brick architecture than the production of moulded and ornamental brick of good design. We have repeatedly called attention to the lack of really first-rate mouldings and ornamental members in most of the brickmakers' catalogues, and we have emphasized this by publishing some of the best examples of old Italian brickwork translated into modern American brick, and by publishing examples of modern English moulded bricks from the makers' catalogues, which, though not above criticism, are still better than most of the mouldings produced by our brickmakers. Architects can, of course, and often do, have special moulded brick made to suit a particular design; but in most cases the use of moulded brick is — both on account of the expense and trouble of having special moulded brick made — confined to the mouldings found in the catalogues. Both to architects and brickmakers, then, this question is important. To architects, in order that they may have better mouldings and in larger variety wherewith to produce their effects; and to brickmakers, in order that they may increase the sale of their bricks; for we are convinced that a better line of mouldings would *pay* the manufacturers adopting them. We referred to these facts in an editorial in our last issue, and we recur to the matter again in this number in order to call attention to a letter from a correspondent, which we print in another column, in which a suggestion is made with regard to it. We need hardly say that we shall be glad to co-operate with any brick manufacturers who may wish to take up this matter in any possible way that may be suggested, either by competition in these pages or otherwise. We earnestly hope the matter may be followed up, and something done to initiate this much-needed reform.

In a recent visit to New York we were much struck by a circumstance which showed at once the foolish New York love of the paint pot, and the hideousness that results from its use on a brick wall. One of the large storage warehouses, whose brick walls had been originally covered with the inevitable coating of glaring and uniform red, had, in the course of time, by many rains and frosts, been robbed of so much of its ugly vermilion that it was becoming positively picturesque. The color of the brick itself began to show through in many places, and the streaking of the rain-washed walls had softened the original shrieking red and brought some variety of color until the eye could rest upon it without pain, if not with pleasure. The huge, almost unbroken wall, capped by a fitting cornice, was imposing from its very size and simplicity, and as we walked up the street we took some pleasure in its restful dignity. The rains of a year or two more, we said to ourselves, will make that wall a thing of beauty. But, alas! as we turned the corner we almost stumbled over a paint pot. Swinging scaffolds were hanging from the lofty cornice, and the greater part of the wall on this side had already been given back to the weary monotony of scarlet, which was rapidly creeping over the rest of the wall like a disease. What a waste of good dollars, devoted solely to making an otherwise pleasant building conspicuously ugly! How often is money denied to our architects to be spent in beauty, and how often, in spite of them, is that same money sacrificed to the demon of ugliness! — or shall we say of conventionality? Only recently we knew of another case, in which the protests of the architect preserved the original soft purplish and varied red of a common brick wall for a number of years unspoiled, to contrast harmoniously with the white marble of the ornamented portions of the building, as in so many old Italian buildings. But in the end, conventionality and the impertinent criticisms of neighbors prevailed — for were not all other brick buildings in the neighborhood painted unless of pressed brick? — and the wall at last was painted a staring red. The building lost half its charm; but at any rate such questions as "I wonder what he is going to do with the wall?" or "Didn't he have money enough to paint his house?" were no longer possible. Unfortunately conventionality, rather than beauty, is the most common criterion of criticism. But New-Yorkers are learning; for we saw another building in which the man with the paint pot had carefully imitated brick by brick the variety of color of the mottled Pompeiian brick, and as imitation is the sincerest flattery, we were inclined to welcome this sham as the sign of the coming of better things. It is hard, indeed, to understand why the charming variety of color of the light colored bricks, which are rapidly regenerating New York, should be admired in such buildings as the Madison Square Garden and the Judson Memorial, and should not be equally desired for red brick buildings, where this variety is needed so much more to soften the strong color.

The *Architectural Record* for the last quarter of the year has an article on the history of terra-cotta in New York City, which is not without interest, although in the main it is little more than a catalogue of certain buildings in which terra-cotta has been used. It does not touch at all upon the advances which have been made in the right treatment of terra-cotta; in fact, the article seems to be really somewhat more concerned with manufacture than with design. The distinction which is drawn, apparently in all seriousness, between terra-cotta and architectural terra-cotta is somewhat amusing. Some of the statements of fact are not entirely accurate; as that the late H. H. Richardson "in 1887" "began using terra-cotta" and "used it upon Trinity Church in Boston." Trinity Church, Boston, was completed in 1877, and its walls are entirely faced with stone, while Mr. Richardson died in 1886. The crestings of the tile roofs are of terra-cotta, it is true; but these, hardly more than the tile roofs themselves, call for mention in this connection. As a matter of fact, although Mr. Richardson made frequent use of brick, he never — except in roof crestings — made any use of terra-cotta. In his brick buildings the ornamental work was nearly always carved brick, as at Sever Hall, Cambridge, and Trinity Rectory, Boston. Mr. Richardson, in his brick buildings, invariably used a specially made common brick, 12 inches long by about 2½ x 4 inches. It may

be regarded as in some sense a forerunner of the 12 x 1½ x 4 inch brick — the so-called Pompeiian shape now so common. The moulded brick used in Mr. Richardson's work was also common hand-made brick.

The illustrations to the article in the *Architectural Record* to which we have referred might have been made a text from which to preach a sermon how to treat and how not to treat brick and terra-cotta. Among the admirable examples we note especially McKim, Mead & White's charming Russell & Erwin building at New Britain, Conn.; Harrigan's Theatre, New York, an admirable example of rich terra-cotta work, by F. H. Kimball; and the DeVinne Press Building, New York, by Babb, Cook & Willard. In the same number of the *Record*, Wyatt & Nölting's excellent Arundel apartment house at Baltimore, Md., is illustrated. We hope at an early date, as requested by a correspondent in our last number, to take up the subject of terra-cotta design and give it some thorough treament in a series of articles on its history and theory.

The December number of the *Inland Architect* has some more or less interesting examples of brickwork, chiefly in domestic architecture, by Rogers & Macfarland, and Mason & Rice, of Detroit; and the number of the *American Architect* for December 31 publishes one of Mr. Wheelwright's interesting brick buildings, the East Chester Park Hospital for contagious diseases, and in the same number is a heliochrome of a house for James Charnley, Esq., at Chicago, by Adler & Sullivan, which shows the dignity and grace there may be in a perfectly plain brick wall, when its divisions and openings are well proportioned. But for the most part in looking over the recent architectural publications, one is struck by the small amount of really good brickwork done and the numerous instances of the misuse and abuse of the material, and we are afraid that the journals are fairly representative of the average of current work. But bad as much of this work is, there is, on the whole, a marked improvement, and certainly no branch of architectural work has made greater or more rapid strides than has brick and terra-cotta work, as shown by the buildings of such firms as McKim, Mead & White, Babb, Cook & Willard, Wilson Eyre, Jr., E. M. Wheelwright, Winslow & Wetherell, F. M. Whitehouse, Eames & Young, and others.

We cannot forbear to express our gratification at the excellent material brought out by our competition for a cheap brick house. Some of the designs to which prizes were not awarded are hardly less good than the prize winners, and we are sure our readers will find valuable suggestions in all of them. All are, more or less, open to criticism in some points; but the designs are serious and thoughtful attempts to solve the problem presented. We do not claim that these designs could in all localities be executed within the limit named; and our jury was requested not to regard the question of cost very strictly. All the designs published seem to come sufficiently near the mark in this respect for the purpose we had in view, viz., to show how attractive an inexpensive brick house can be made. The designs will be found fully discussed in the jury's report which we print in another column.

RESTORATION OF AN ANCIENT CHURCH.

The restoration of one of the oldest church edifices on this continent is now in progress at Smithfield, Isle of Wight County, Virginia. It is in a picturesque and historic locality, ten miles diagonally across from Newport News and fifteen from Fortress Monroe, and is connected closely with many memories that are famous in the early history of America. It is a unique example of church architecture, having been constructed of brick with a massive Norman tower fifty feet in height at the western end. The walls of the tower are nearly three feet in thickness at the base, tapering slightly toward the top. That it was built in 1632 is proved by written records and well-sustained tradition, and if any doubts exist they are dispelled by the bricks, many of which bear that date. The tower overshadows the less pretentious nave, which suggests many of the parish churches in England. — *Southern Architect.*

A VETERAN BRICKMAKER'S APPROVAL.

We are in receipt of a letter from Mr. J. W. Crary, Sr., of Bluff Springs, Fla., and take the liberty of publishing a portion of it, which shows that the writer is in most thorough sympathy with our work. Mr. Crary has had a long and practical experience, not only in brickmaking, but in brickbuilding. He is one of the pioneer brickmakers of this country, and has always been in sympathy with everything tending to improve bricks and brickwork. As a writer he is well known in his technical field, and is the author of "Brickmaking and Burning." There are few whose appreciation we value so much.

He says: "You have chosen a good name for your paper; it suggests a special and very important subject. The world has had its *mound* builders, its *stone* builders, and its *wooden* builders, and now we are just fairly entering into the *brick* builders' age. There is a great deal to say on this subject, and as it is comparatively new, you have entered the field, perhaps, more auspiciously than have your contemporaries.

"If I have the right conception of your enterprise, it will be your special object and office to show to the general public the great advantage of brickbuilding and work over all other kinds in the construction of houses, or improvements of roads and streets. All these have a moral, social, political, sanitary, and pecuniary significance, and it requires no begging, or misuse of logic and argument, to show the reasons, or make the facts apparent and impressive.

"I am very truly yours,

"J. W. Crary, Sr."

BRICKS AND BRICKWORK.*

There are few more fascinating subjects of inquiry and speculation combined than the attempt to reconstruct for ourselves the daily life and habits of long-forgotten generations of men. Any such attempt will soon convince us that our present civilization is the direct outcome from conditions of things which were as unlike as possible those with which we are familiar nowadays. Just as Darwin and Huxley have proved that evolution has been at work in the animal world, modifying — by very gradual and, at the time, imperceptible steps — the frame and physical organs of living beings, or, as Mr. Herbert Spencer has pictured for us, the slow growth and development of our social relations, so I believe a careful investigation would show that our dress, our dwellings, and particularly the architectural forms and features of our buildings, whether private or public, can all be traced back to simple elementary types. The history of the development of the human dwelling, if worked out thoroughly in a scientific spirit, would not only be a subject of the deepest interest to all who have to do with modern buildings, but would clear up many of the knotty points upon which archæologists have never been able to agree, and I venture to hazard the suggestion that such an inquiry would go far to prove that the origin of the ecclesiastical architecture of all times and countries is far humbler than many persons would have us believe. However rude and savage might be the earliest inhabitants of any country, they would soon endeavor by some means to obtain shelter from the elements, and a secure retreat in case of attack from the wild animals and more dreaded men by whom they were surrounded; and the means which they would adopt for this purpose would depend upon the physiography of the district in which they happened for the time to be located. It would frequently happen that, if living on a rocky seacoast or by some swiftly flowing river that had worn away portions of the adjoining hillsides, they would find numerous caves and hollows, the possession of which they would have to dispute with some wild animals, but which would provide the necessary shelter; and it is perfectly certain that primeval men would make use of such cave-dwellings, ready made to their hand by nature, rather than take the trouble of erecting dwellings for themselves.

Every one knows that many of the most interesting relics of prehistoric man have been found in such caverns in all parts of the world. But these early progenitors of ours would have to live, and, as they increased in numbers, they would range over an ever-widening extent of country in order to obtain sustenance, and would gradually begin to make temporary settlements wherever good hunting was to be had. If no caves were to hand they would make use of the most easily manipulated material, namely, the branches and trunks of trees, which, with but slight trouble, could be formed into rude huts and covered with leafy boughs as a roof. In process of time these nomad tribes would cease to live by hunting only, and would begin to practise the elements of agriculture, settle down for a longer period than usual, and form some sort of community, and they would soon turn their attention to the construction of buildings more durable than the shanties which were sufficient for a few days' occupation only. The first rudiments of building were undoubtedly the cutting down and piecing together thicker and more substantial pieces of timber, and, as men grew more expert in the use of their rude implements, simple patterns would be cut in the timber, the repetition of which would form a band of ornament, and we should have the commencement of a timber style of architecture.

In some countries, such as Japan, and to a large extent in China, a timber architecure survived with the growth of civilization, and most picturesque results were obtained from the elaborate carvings and decorations with which these buildings were enriched. But, as a rule, when men began to advance in intelligence and manual skill, and the use of metals was discovered, they could not fail to contrast the ephemeral and destructible character of their timber dwellings with the hard, dense, and apparently imperishable nature of the rocks and stones which formed the everlasting hills which they saw around them. And you must remember that, although no means of quarrying then existed, Nature herself is the most efficient quarryman. Water and frost, heat and cold, will, in the course of ages, break up into manageable sizes the hardest rocks, and I do not think there can be a doubt that the earliest stone buildings were formed of rough pieces of rock picked up haphazard and roughly fitted together, the insterstices being filled up with some softer materials, such as clay, earth, or sand. Any one who has examined the remains of the early British villages which exist in many parts of Cornwall, or the very interesting chapel of St. Piran in that country, which dates from the seventh century, cannot fail to be struck by the fact that, as far as the walls are concerned, the stones had no work on them at all, and were simply brought to the spot just as they were found on the hillside, and placed in position as they happened to fit. The probability is that the first enterprising tribesman who built himself a stone dwelling would run the risk of having it pulled down about his ears by his neighbors for his presumption, but gradually his example would be followed, and we should have the rudiments of a stone architecture. You have probably been wondering what on earth all this has to do with bricks and brickwork, but you will see that I am gradually getting a little nearer my subject.

I have endeavored to sketch out what would happen to the early inhabitants of a stone country, but in many places, as the population increased, communities would settle down in districts where no stone existed and where the soil was chiefly of clay. Here the enterprising builder would find no hard material ready for his use, but he would notice how in summer this clay became exceedingly hard when the sun beat down on it, and the ingenious man would one day be struck with the idea that if he could dig up lumps of clay when it was soft, of a size that could easily be carried, and let the sun harden them, he would be able to transport them where he liked and use them to make a house with; and in this you have the first beginning of a brick architecture.

The use of unburnt, sun-dried bricks dates back to a hoary antiquity; they were made and used for all kinds of building in Egypt, Greece, where the palace of Crœsus and that of King Mausōlus were thus constructed, Assyria and Persia, and in hot, sunny countries they are still used to-day. Chopped straw was mixed with the clay in order to give it a consistency, and where very little rain fell these bricks answered fairly well. In fact, they formed the principal material with which the enormous and elaborate Ninevite and Babylonish palaces were constructed. If not very carefully tempered, these sun-dried bricks soon become very friable; and it is owing to this fact that, of the majority of those wonderful cities of the East which we read of in history, nothing now remains but a heap of earth and rubbish. But it is also to the fact that the rubbish appeared absolutely valueless that we owe some of the most interesting discoveries of recent years. Wherever any old stone buildings existed that became ruinous or deserted, the neighboring inhabitants invariably used them as a quarry and carried away the stone for their own use; but in Assyria no one ever thought it worth while to cart away crumbling clay and earth.

Some few years ago a Frenchman named Botta obtained the requisite permission to excavate one of these huge mounds in the desert, with only a few straggling huts around it. His explorations were continued by M. Victor Place, and the result was most unexpected, and showed that many of our architectural forms and features have a much greater antiquity than any one imagined. One can easily understand that in a clay district it would soon become apparent that artificial heat, such as might be obtained from a cooking place, hardened the clay and altered its color, but few can have imagined the use that was made of the knowledge of this property in the clay for the production of decorative effects.

These excavations took place about twelve kilometres from the Tigris, at a little village, the modern name of which is Khorsabad, which is on the site of the great palace built by King Sargon. Buried under the *débris* of centuries was found a walled city with fine gateways, the palace itself with a magnificent arched gateway of brick, the voussoirs being carefully moulded to the proper shape and enamelled in various tints, forming a beautiful pattern, and as vivid as if they were lately taken from the kiln; artificially burnt bricks used for paving, and so hard that when struck they rang like a bell, the discoverers using them as paving for the floor of their temporary stables; arched covers for sewers formed of radiating bricks accurately moulded; and glazed wall-tiles in profusion, were discovered. The sizes of the bricks varied considerably, the paving bricks being about 15½ inches square and 2¼ inches thick, and these were carefully laid in two courses, breaking joint; their color was a dull red, approaching brown. The arch bricks in the conduits or sewers were curiously formed, every alternate course having a keystone of peculiar shape, and M. Place's belief is that the intervals were keyed with ordinary unbaked bricks, thus affording,

*A paper by Mr. John Slater, B. A., Lond., read on the 5th inst. before the Liverpool Architectural Society.

in case of repairs being required, an easy means of entering the sewer.

The height of the walls of the palace was about 15 metres or 49 feet, and their thickness 5 metres, while the height of the encircling wall of the city itself was about 23 metres, and the thickness nearly 8 metres. The gateways both of the city and the palace were of such a kind as one would never have expected, being true arched openings about 14 feet in width and 21 feet high, the arches being formed of four rows of bricks very carefully laid, with radiating joints. It is a most extraordinary thing to find these old Assyrian builders planning and executing so fine a work as this. There is one peculiarity about these glazed bricks: although their color was perfect and the bricks themselves uninjured, they were comparatively soft, and the part built into the wall could be dented by the mere pressure of the hand.

Although, as I have stated, bricks were used in Greece, yet the abundance of excellent marble in that country prevented builders having recourse to an artificial material. In Rome, however, and her colonies brick was extensively used, although recent investigations have shown that many of the old Roman buildings which were supposed to be erected of solid brick are really only brick faced, and that the interior of the walls is concrete of the most admirable kind. Apart from this, however, there can be no doubt the Romans were excellent brickmakers, as is evidenced by the present condition of many buildings which were erected in various parts of Europe and this country during the Roman occupation. Take the Basilica at Trèves, for instance, nearly the whole of one side of which is the original brickwork, as well as the lofty arch between the apse and the main body of the building, and if you examine it carefully you will see that there was no scamping in that work. The excellence of Roman bricks is further shown by the fact that in many parts of this country what are undoubtedly Roman bricks that have been taken from some banished building and reused in other places are still found in an unimpaired condition of strength.

After the close of the Roman dominion, brickmaking, as well as nearly all other arts and sciences, fell into decay, and it is a curious fact that, whether in the British Isles or on the Continent, we have very few remains of any brickwork that is not Roman until about the thirteenth century. Saint Sernin, at Toulouse, a church of the twelfth century, is partially built of brick; but the convent of the Jacobins at Toulouse, dating from the end of the thirteenth century, is one of the finest examples of brick building in the Middle Ages. As Viollet-Leduc points out, it is in this part of France that good building stone is entirely wanting, and consequently the architects of the time were compelled to elaborate a style of their own in the only available material, brick. In the thirteenth, fourteenth, and fifteenth centuries French bricks were of larger size, about $13'' \times 9\frac{3}{4}'' \times 2\frac{1}{4}''$, and the mortar joints were frequently within a fraction of an inch as thick as the bricks themselves. Moulded bricks are but rarely met with, but cut brickwork of very interesting character is found much oftener. It is clear to my mind that Viollet-Leduc, with all his wide knowledge and versatility, held brick architecture in somewhat low estimation, for two pages in his *Dictionnaire* dispose of the subject.

In Germany you will find brick largely used in those districts where stone is poor and scarce, but the general mode of treatment in that country is somewhat heavy and uninteresting. There are, however, many fine examples. The Marien Kirche at Lübeck, dating from the end of the thirteenth century, is one of the best specimens of German brick architecture, and this church had a great influence on the style of the surrounding parts of the country. At Brandenburg on the Havel is the fine church of St. Catherine, late fourteenth century, which has one of the most elaborately ornamented exteriors of any brick edifice, and at Prenzlau, Thorn, Seehausen, and other places in North Germany are interesting examples. I have noticed one peculiarity in modern brick buildings in Germany, which is this: the joints are left raked out for a depth of about half an inch from the face of the work as if for pointing, but no pointing is inserted. In appearance the effect is not bad, but I should think it must increase the tendency of wet to soak through the walls.

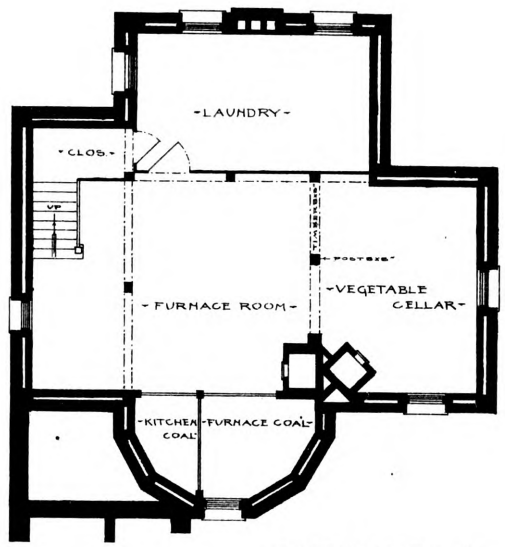
In Spain brick was used extensively and effectively in the Middle Ages, though in a manner quite distinct from that which prevailed in other parts of Europe. Mr. Street has little doubt that by far the larger part of the brickwork in Spain was done by Moorish workmen who retained their old constructive traditions. The special peculiarity of Spanish brickwork seems to be that it was rarely moulded, and that effect was obtained by simple projections, as at Zaragoza, where patterns are formed by setting forward the bricks forming the outlines from one and a half to two inches beyond the general face of the wall, and filling up the spaces with a diaper of small tiles.

All the Spanish bricks are narrow — a little over one and a half inches thick—and the mortar joints are half an inch thick. The Torre Nueva, in the same city, used to be one of the very finest specimens of brick architecture, octagonal in plan, and the faces covered with diapers; but, unfortunately, this most interesting relic of the Middle Ages has very recently been taken down because of its leaning so much out of the perpendicular. At Toledo the churches of San Roman and Santa Magdalena are excellent examples of the simple and proper use of brickwork. Street says of Santa Magdalena: "The bricks are used very roughly and picturesquely, with a very thick mortar joint, and the consequence is that every part of this work has a value in texture and light and shade undreamt of by those who have never seen anything but our own smooth, smart, and spiritless modern brick walls, built with bad bricks and no mortar." And he goes on to say, in a note: "I am aware that in saying this I blame myself as much as any one else."

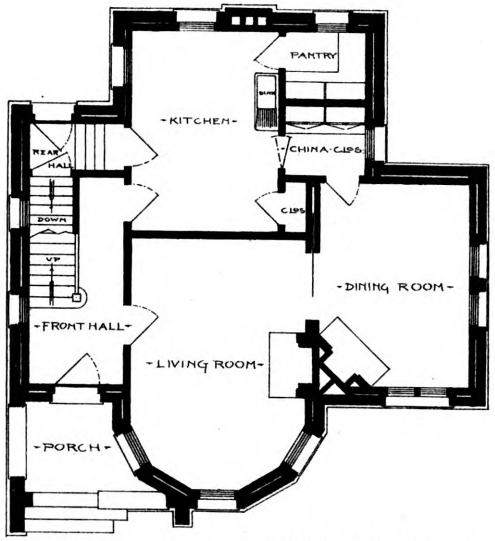
The Netherlands are rich in brick buildings, and I know nothing much more interesting than a ramble through the narrow streets of some old Flemish city, where each house seems to try and outdo its neighbor in the quaintness and originality of its steep brick gables. Picturesque, however, as these are, they always strike me as somewhat wanting in grace and refinement. They are the honest and often successful efforts to escape from monotony of a somewhat rough and uncouth race, whose exuberant genius was unrestrained by any knowledge of or love for proportion, such as is shown in classic architecture. The general effect is quite charming, and we, who are accustomed, in the majority of our English cities, to the horrible monotony of a straight skyline formed by a parapet which completely conceals the roofs, can readily forgive the quaint fancy which ran riot in these stepped gables; but the detail is often unsatisfactory, and it is not till we visit North and Central Italy, where the Roman genius and classic traditions had lingered longest, and where the strength of the Northern Gothic was restrained and curbed by the Southern love of color and refinement, that we find the highest development of a brick style in architecture; and an examination of these buildings will, I think, effectively dispel the notion, which some people used to be so fond of holding, that brick is a vulgar and inferior material, unfit for use in a large monumental edifice.

Street's volume on *Brick and Marble in North Italy* came nearly forty years ago as a revelation to many, and the swing of the pendulum which, during the last few years, has sent Gothic art out of fashion, and has brought to the fore a style which, with all its merits, appears to me to carry in itself the seeds of its downfall and decline as surely now as at the time of its first inception, in that lack of reserve and striving after the *outré* and the fantastic which speedily swamped what was true and good and beautiful in the Renaissance, and led to all the monstrosities of the Rococo, — this late rebound, I say, may very probably have prevented the student of the present day from giving that attention to the Gothic architecture of North Italy which it well deserves. Personally, I know of no more delightful field of study. The lovely variety of tint of the mingled brick and stone work, the juxtaposition of the circular and pointed arch, and, above all, the charming simplicity with which the most beautiful effects are produced, all combine to make the brick architecture of this district unequalled in attractiveness.

Take Verona, for instance — the city which lives in my recollection as the most picturesque in its surroundings and the most interesting in its buildings of any that I have ever visited — the first thing that strikes the eye here is the noble campanile which rises from the group of buildings at the cornor of the Piazza dei Signori to a height of nearly 320 feet, though its lower part is concealed by surrounding buildings. It is built at first in alternate courses of brick and stone, and then wholly of bricks. For more than half its height it is quite plain, entirely without buttresses, and pierced by three or four small openings only; and then there is a belfry stage, above which is an octagonal story of later date. The belfry windows are contained under a large pointed arch, and are divided into three lights, with coupled marble columns, the voussoirs of the arches being alternately of brick and stone. Verona is absolutely full of objects of interest, but I can only mention a few as illustrating my subject. The cloisters of the Church of

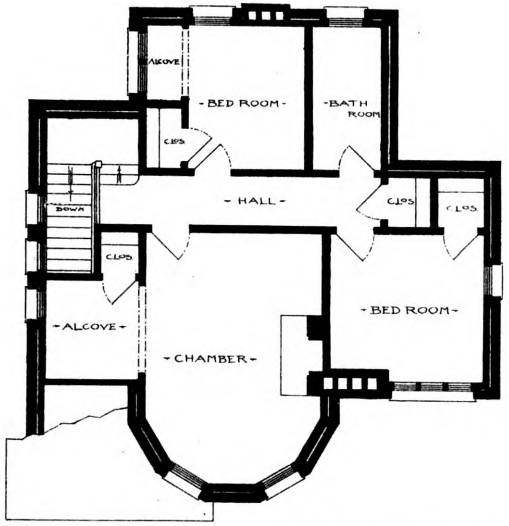


BASEMENT PLAN



FIRST FLOOR PLAN

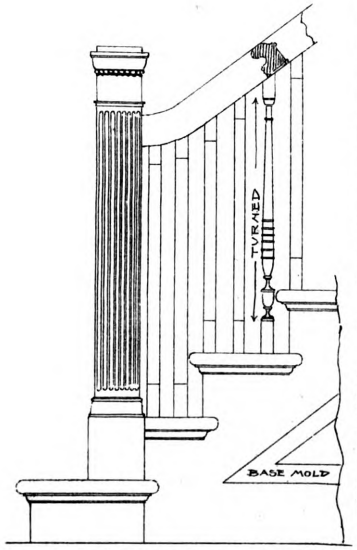
SCALE 3/16 TO 1'



SECOND FLOOR PLAN

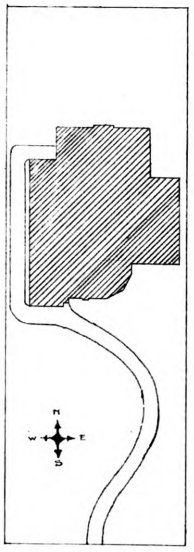
SUBMITTED BY STANLEY

PERSPECTIVE VIEW



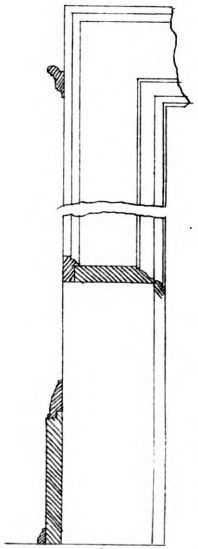
SIDE VIEW OF STAIR

SCALE 1½" TO 1'



LOT PLAN

SCALE 1/16" TO 1'

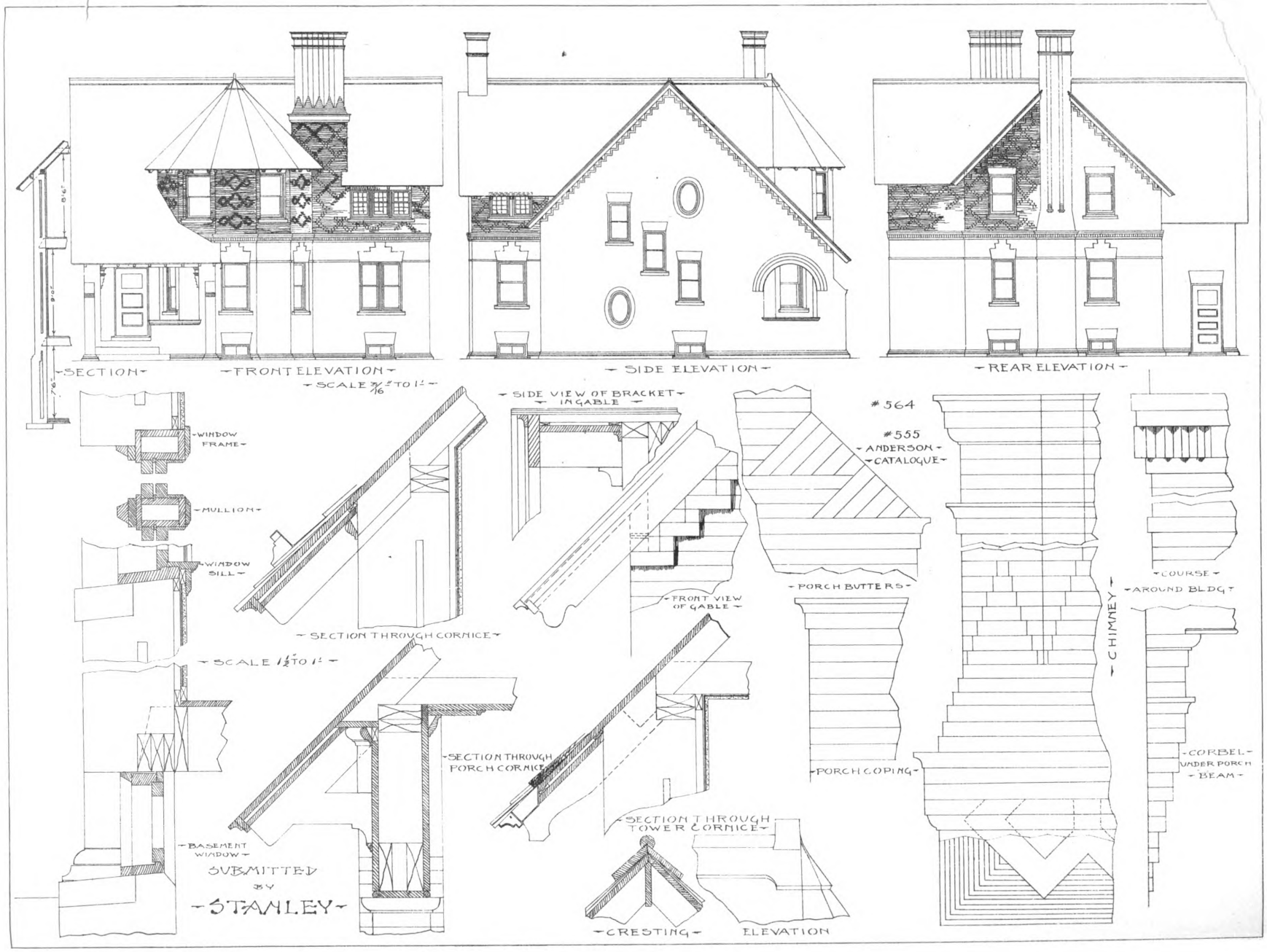


CASING & BASE

SCALE

PLATE 93.

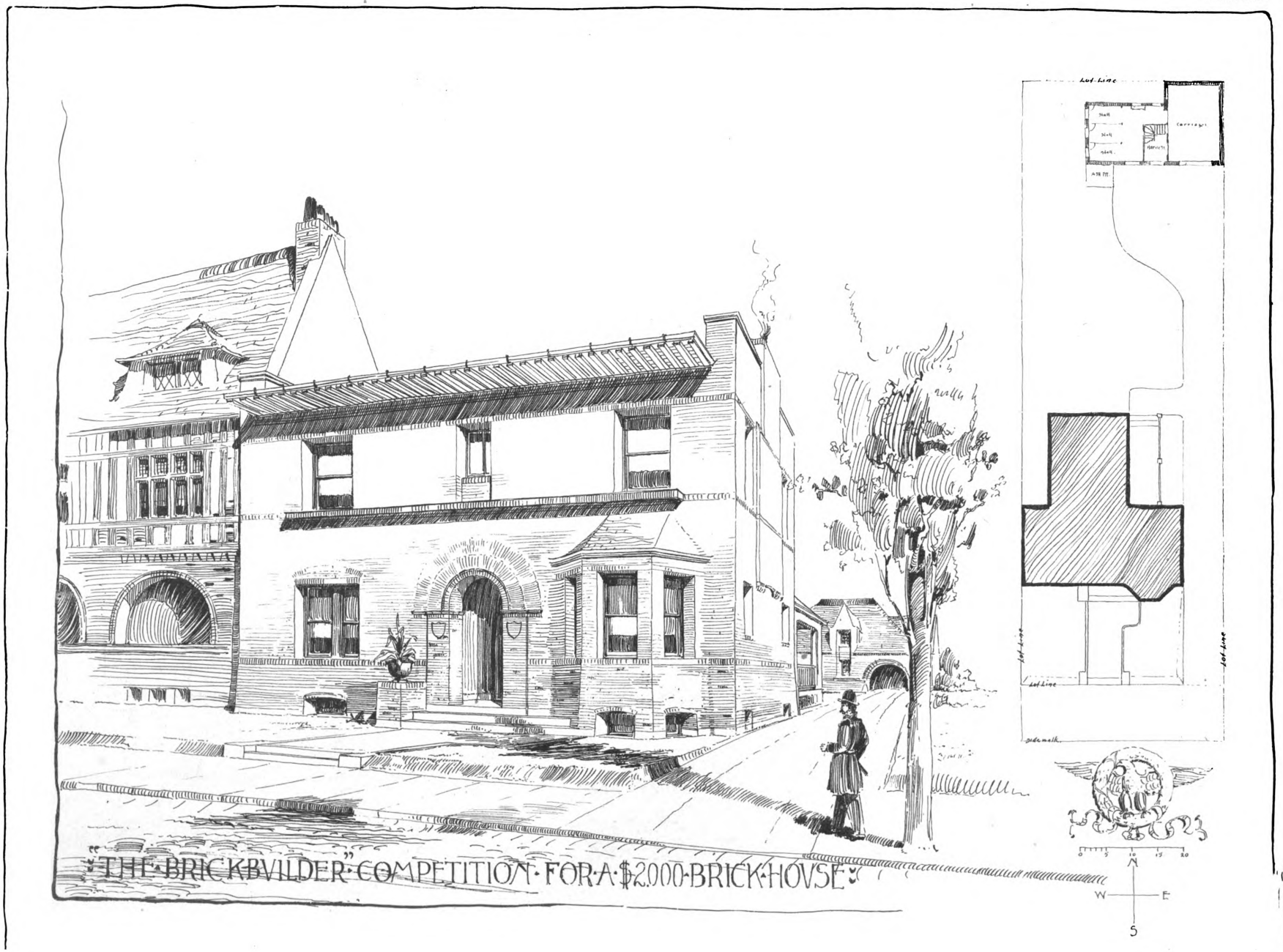
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.



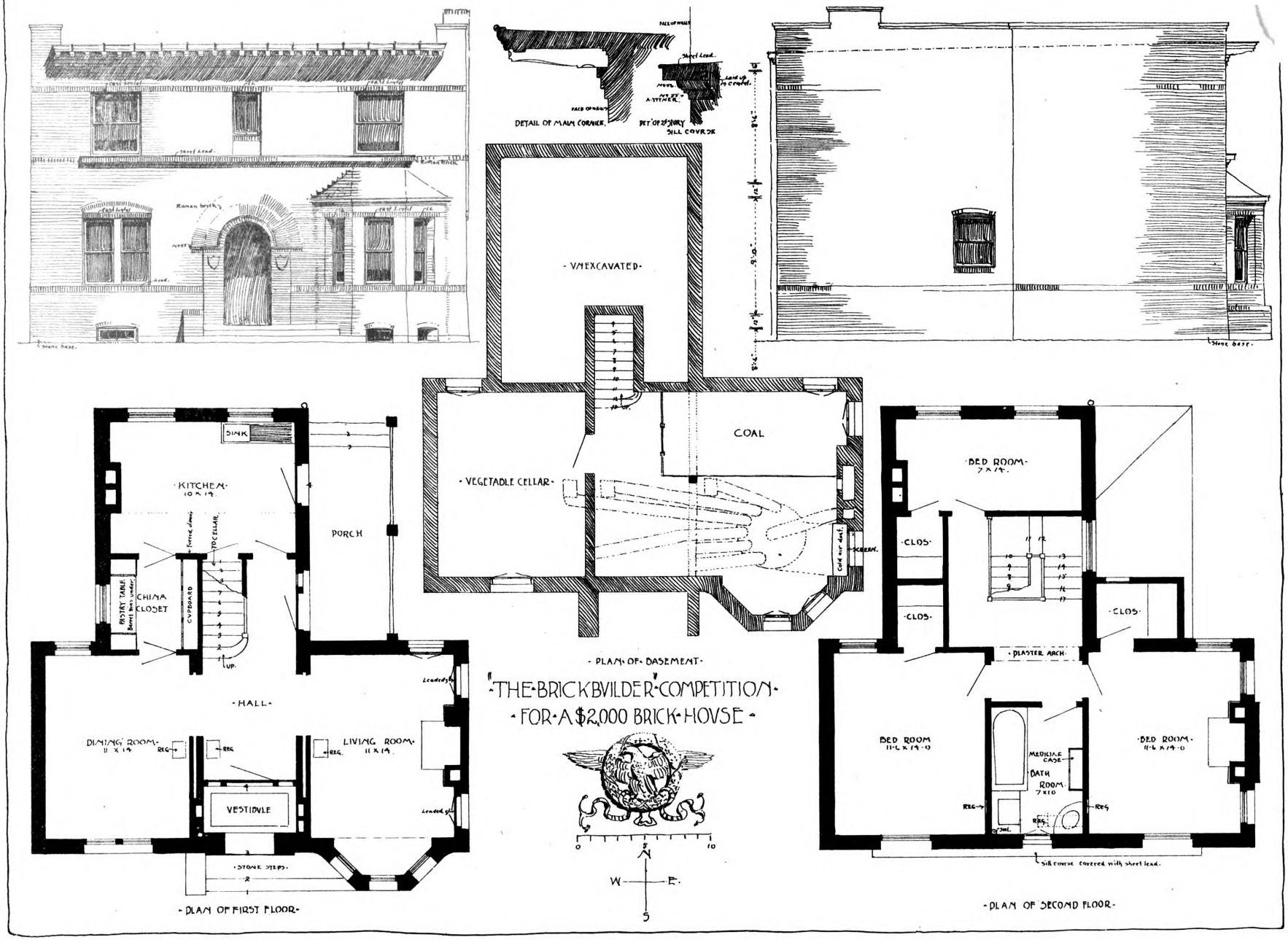
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY STANLEY F. KADOW, MILWAUKEE, WIS.

AWARDED PRIZE.



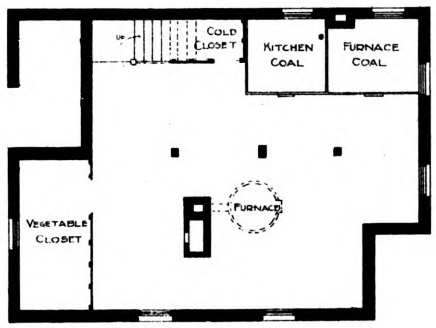
"THE BRICKBUILDER" COMPETITION FOR A $2,000 BRICK HOUSE.



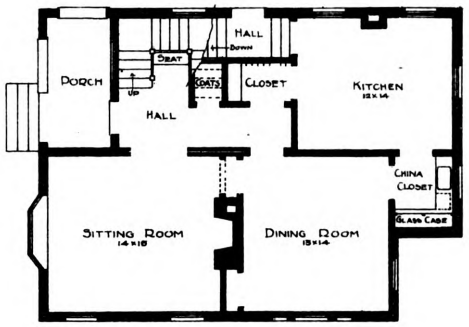
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY JAMES C. GREEN, ST. LOUIS, MO.

AWARDED PRIZE.



BASEMENT PLAN



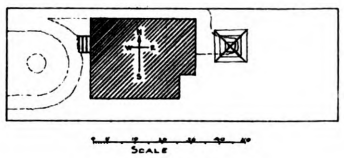
FIRST FLOOR PLAN

PERSPECTIVE · FROM NORTH WEST

A CHEAP BRICK HOVSE

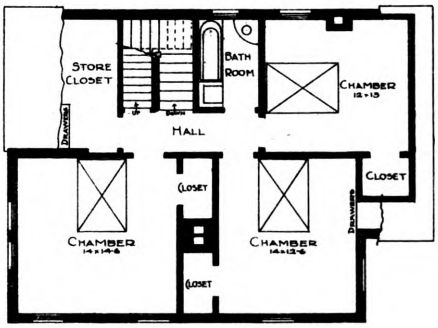
BY

SCALE



BLOCK PLAN

SOUTH ELEVATION



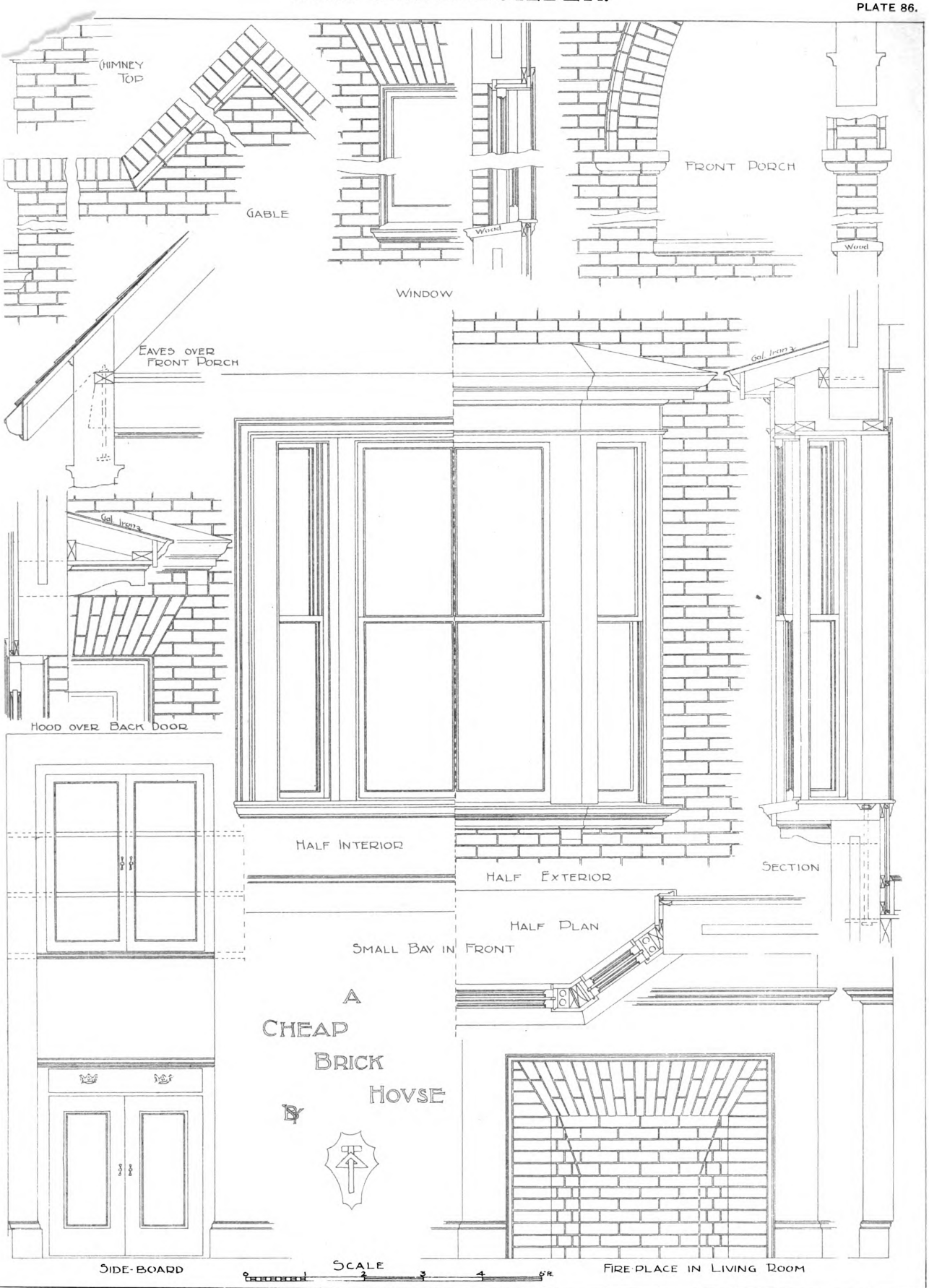
SECOND FLOOR PLAN

CHAS. H. A SONS, LITH. 36 VESEY ST., N. Y.

THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY WILL. S. ALDRICH, SOMERVILLE, MASS.

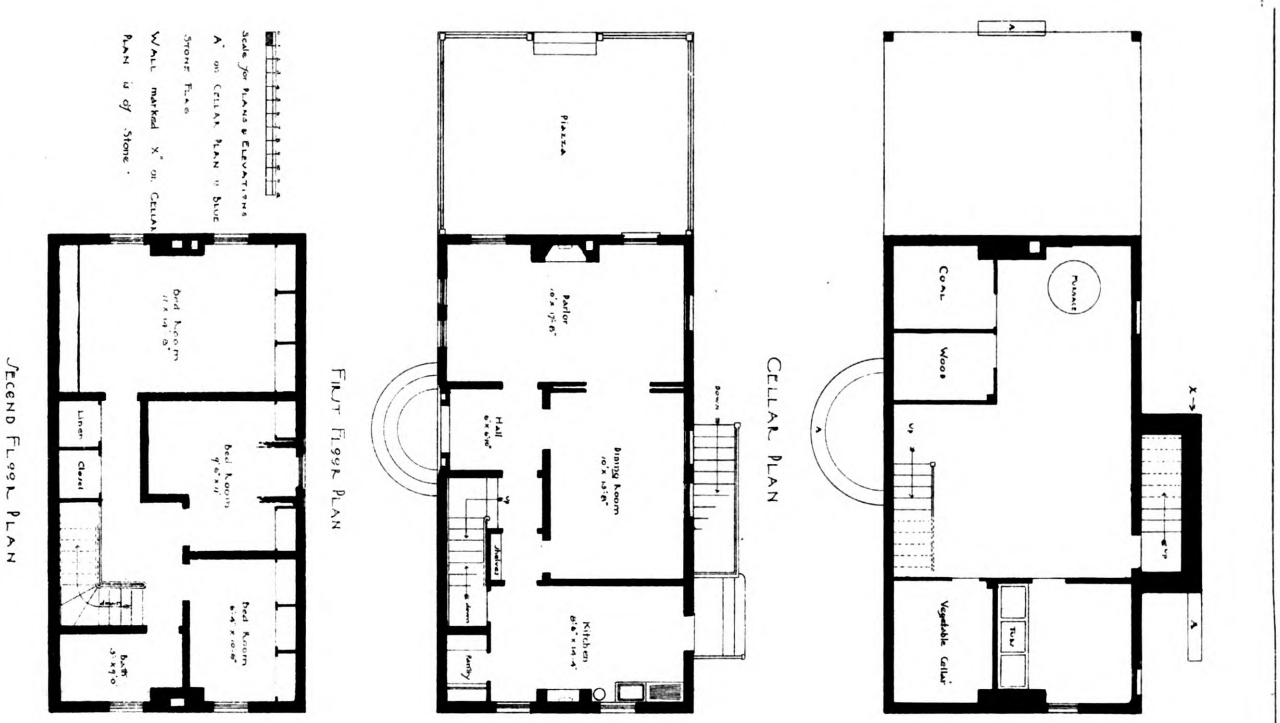
AWARDED PRIZE

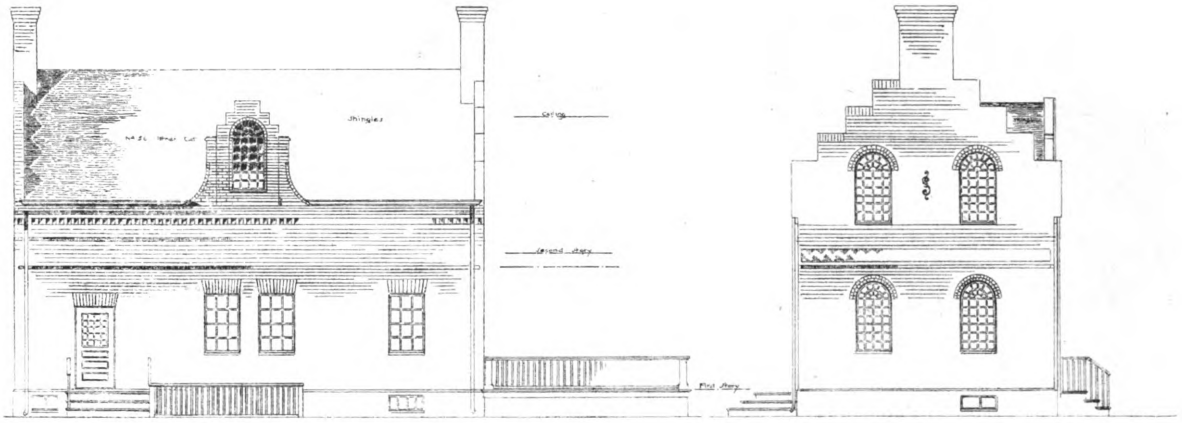


THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY WILL. S. ALDRICH, SOMERVILLE, MASS.

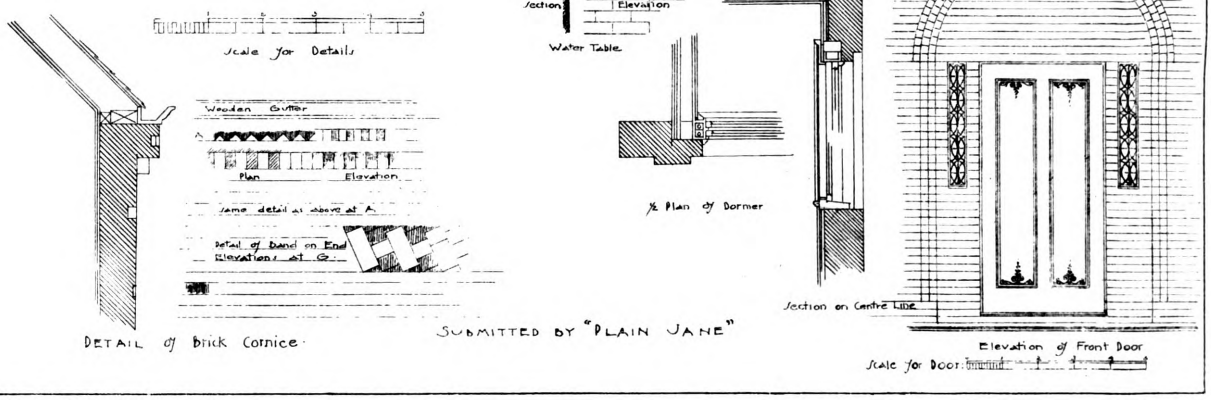
AWARDED PRIZE.





North Elevation

East Elevation



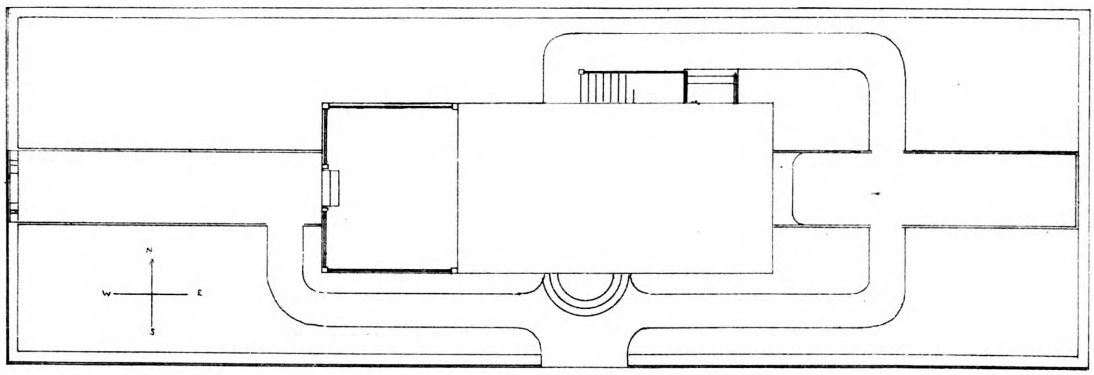
Detail of Brick Cornice

Submitted by "Plain Jane"

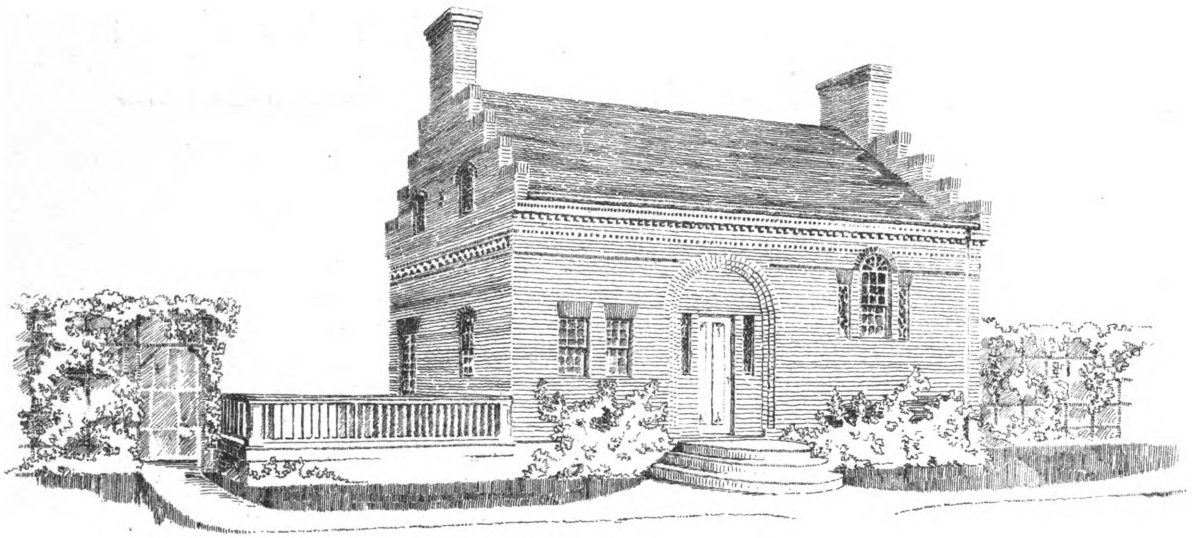
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY HARRY EDWARD PRINDLE, N. Y. CITY.

AWARDED PRIZE.



LAYOUT OF GROUND



PERSPECTIVE VIEW

SPECIFICATION NOTES

It was the intention of "Plain Jane" to design a house simple & homelike in character, of good but plain construction, & with such surroundings as would give it a feeling of retirement & rest. It is surrounded by a hedge as shown, which would be better replaced by a brick wall on the street sides, with simple gates: The Arbors are designed in order to secure more retirement from street

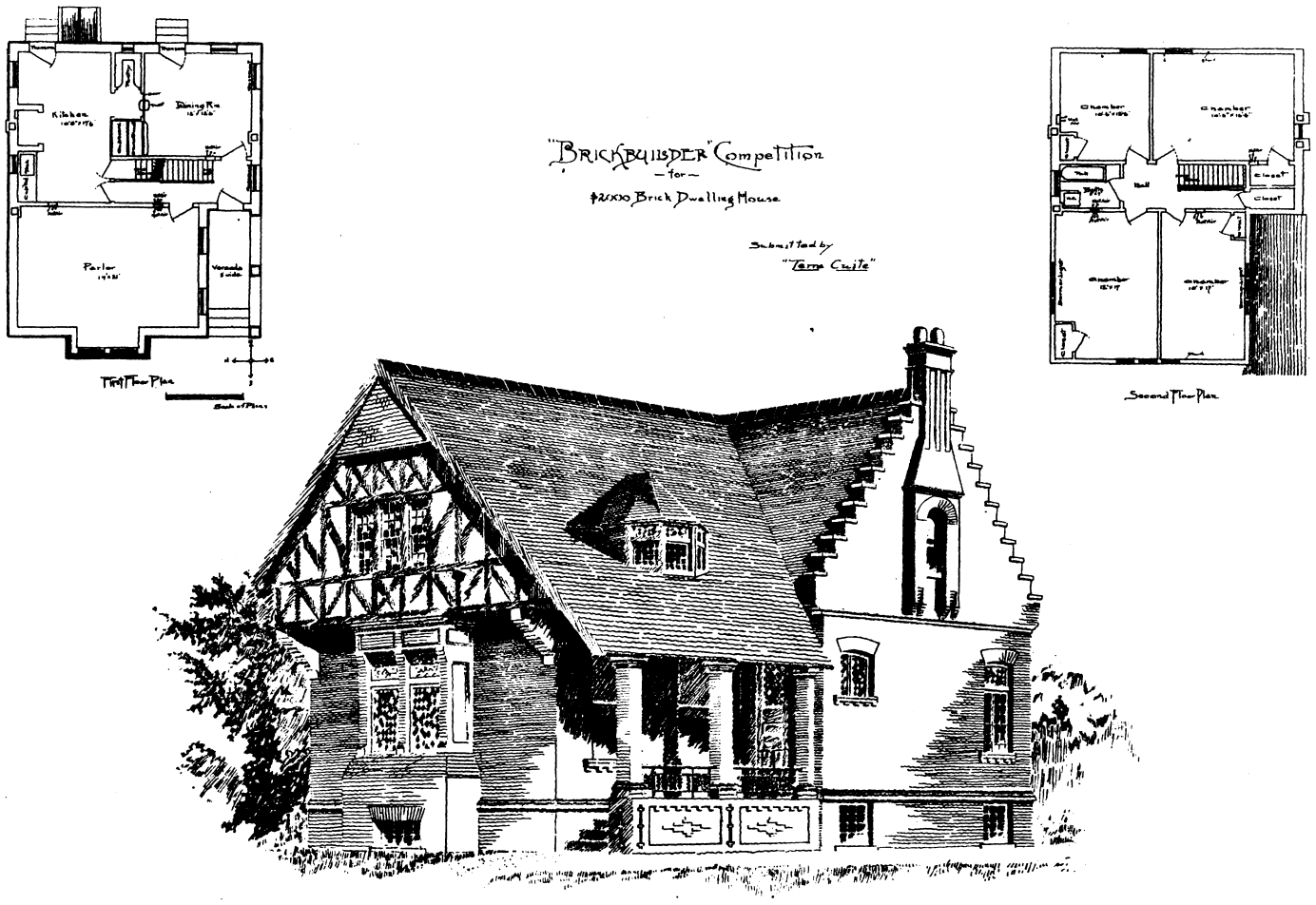
Concrete Footings under all Walls, Piers & Chimneys: Cellar floor concreted 3" thick: Good Floor to be laid in Vegetable Cellar: double floor in the Laundry: rough floor in Coal & Wood Bins: Wooden Tubs: Stairs to First Story well built, stout handrail, no risers. Brick work throughout to be best hard burned ordinary brick: mortar of equal parts lime & cement: Terra Cotta flue pipes: Blue stone cap to Chimneys: Steps in Gable cemented on top, with pitch for water: All rooms to have one heavy brown coat, & one coat of hard finish plaster: House to be well timbered throughout: beams 3"x10", 16" o.c. rafters 2"x6" 16" o.c. Jingle Georgia Pine floors: Stud Partitions: Plain Trim: Stairs to 2nd Story of Pine, finished in hard oil: Balusters, square: Plain handrail: Box Frame windows: Front Door finished in White: House to be heated by registers from Furnace: Hot & Cold Water in Kitchen, Laundry & Bathroom: W.C. & Basin in Bath also. Piazza to have stout handrail & square balusters: Painted white: Wooden steps outside, front & rear, to be finished same as piazza. Galvanized iron Leaders:

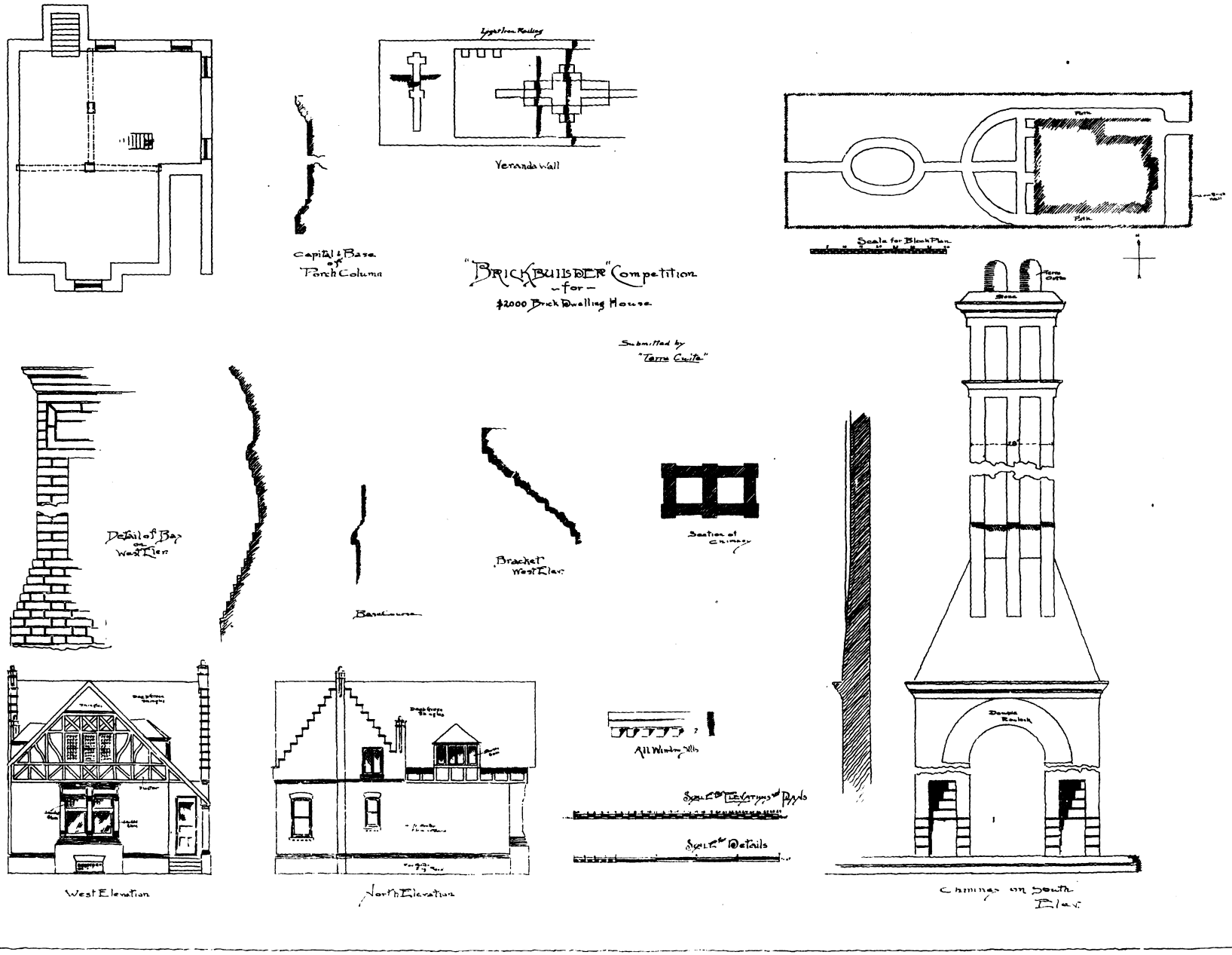
SUBMITTED BY "PLAIN JANE"

THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY HARRY EDWARD PRINDLE, N. Y. CITY.

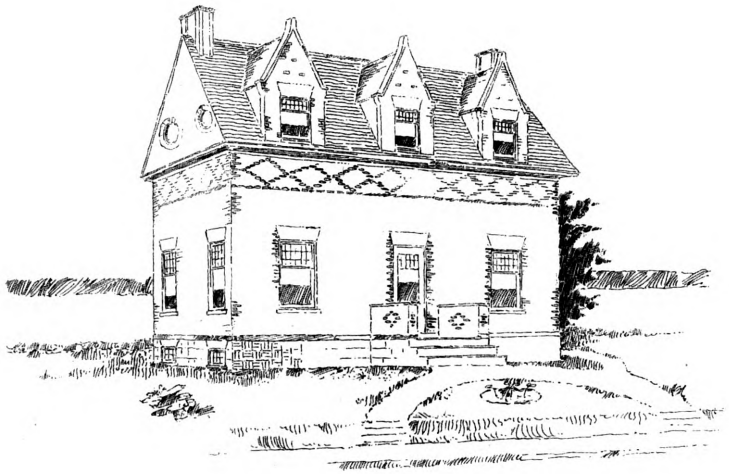
AWARDED PRIZE.

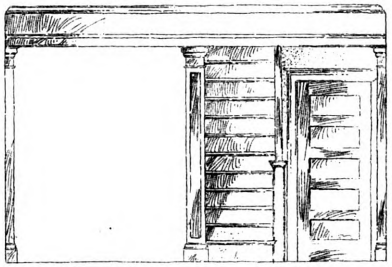




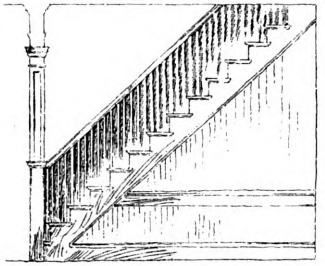
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY C. HOWARD LLOYD, BOSTON, MASS.

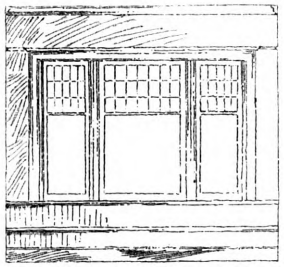




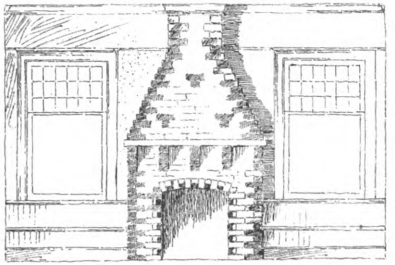
PARLOR LOOKING TOWARD STAIRS~



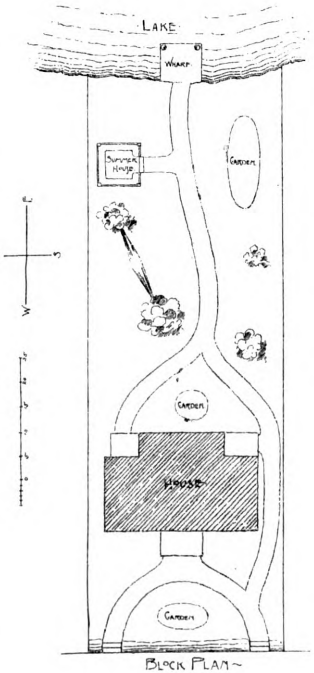
STAIRCASE IN HALL~



DINING ROOM LOOKING TOWARD LAKE~

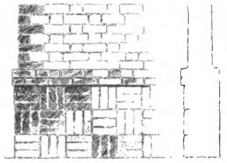


NORTH SIDE OF PARLOR~

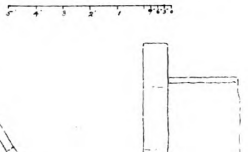


BLOCK PLAN~

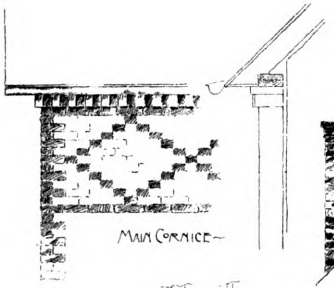
WINDOW OPENINGS~



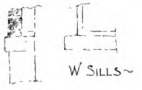
UNDERPINNING WATER TABLE AND CORNERS OF HOUSE~



FRONT PORCH~

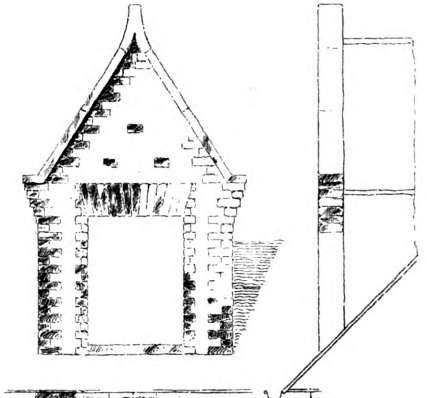


MAIN CORNICE~

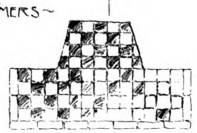


W SILLS~

CHIMNEY CAPS.



BRICK DORMERS~



HEARTH~

THE BRICKBUILDER

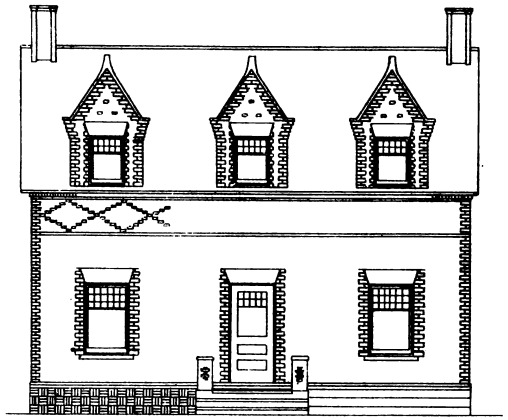
COMPETITION No 7

A 2000 HOUSE

SUBMITTED BY

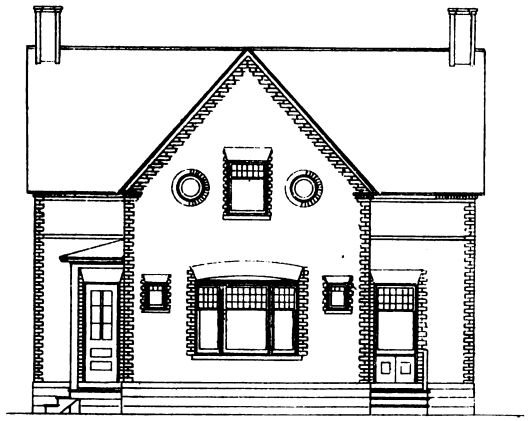
WHIZ -

SIDE OF MANTEL~



STREET FRONT.

THE BRICKBUILDER
COMPETITION No 7.
A $2000 HOUSE
SUBMITTED BY
WHIZ



LAKE FRONT.

SPECIFICATION.

MASON.

EXCAVATE FOR CELLAR ETC AND GRADE 9" IN REAR TOWARD LAKE.
FOUNDATIONS OF BEST LOCAL QUARRIED LOCAL STONE LAID IN BEST CEMENT MORTAR
BRICK WALLS OF SOFT LOCAL BRICK, EXCEPT PORTIONS SHADED DARK OR DETAILS WHICH WILL BE OF HARD BURNED LOCAL BRICK DARK COLOR AND SUCH AS ARE FOUND NEAR THE FIRE IN KILN. ALL LAID IN BEST LIME MORTAR COLORED RED WITH JOINTS KEPT BACK ⅜".

CARPENTER.

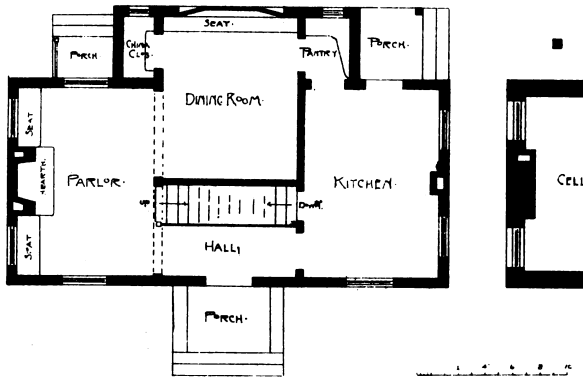
ALL TIMBER (BEST SPRUCE OR HEMLOCK)
JOISTS 2"x9" AND 2"x8". PLATES 2"x8". STUDS 2"x4" RAFTERS 2"x6"
GIRDERS 6"x8". FLOORS ⅞"x4" 2ND QUALITY PINE. WINDOWS (BOX FRAMES, SASH 1⅜" DOORS 1¾" OUTSIDE, 1⅜" INSIDE. INSIDE FINISH OF FIRST QUALITY WHITE PINE OR CHESTNUT. TRIM ⅞"x4½" PICTURE MOULD 1¼" BASE 9" HIGH. STAIRS AS PER DRAWINGS. GLASS 1ST QUALITY AM. SHEET. DOUBLE THICK.

PAINTER.

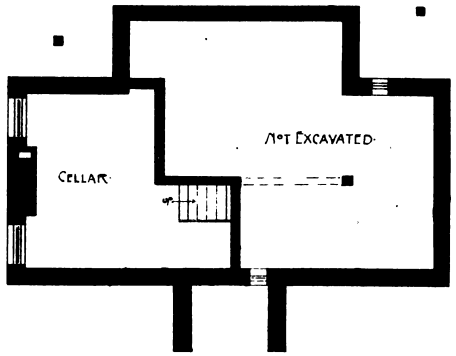
INSIDE FINISH OF PINE PAINTED 2 GOOD COATS OF WHITE LEAD AND OIL IN ANY COLOR, BUT IF OF CHESTNUT TO BE FILED AND THEN TO HAVE 2 GOOD COATS OF VARNISH.

COST FROM ESTIMATE.

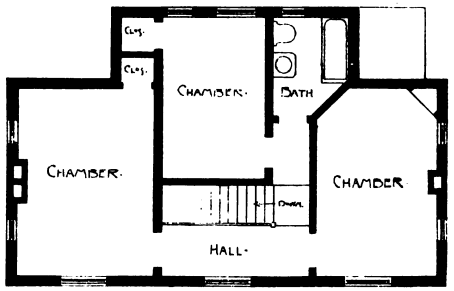
EXCAVATING.	$ 75
STONE.	50
MASON	785
CARPENTER & PAINTER	077
	$1987



PLAN OF FIRST FLOOR.



PLAN OF CELLAR.

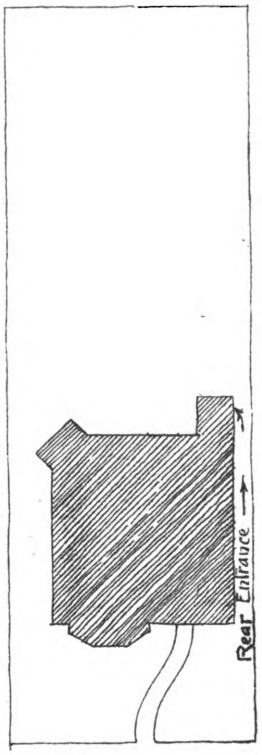


PLAN OF SECOND FLOOR.

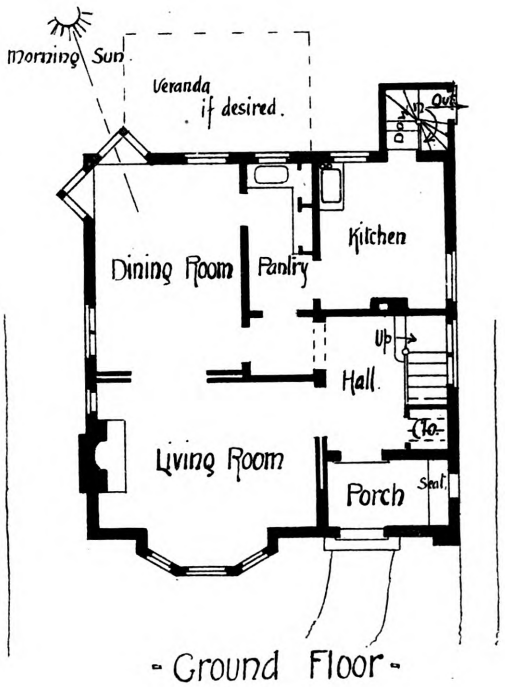
THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

DESIGN BY J. MILLS PLATT, ROCHESTER, N. Y.

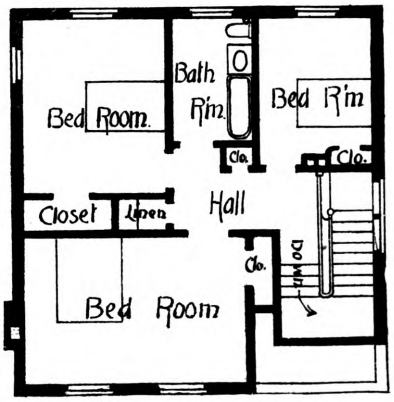
"BRICK-BUILDER" COMPETITION No. 7



Block Plan



Ground Floor



First Floor

Scale 1 2 3 4 5 10 15 20 25 ft.

"Demos"

THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE

DESIGN BY ARTHUR E. WELLS, BROOKLYN, N. Y.

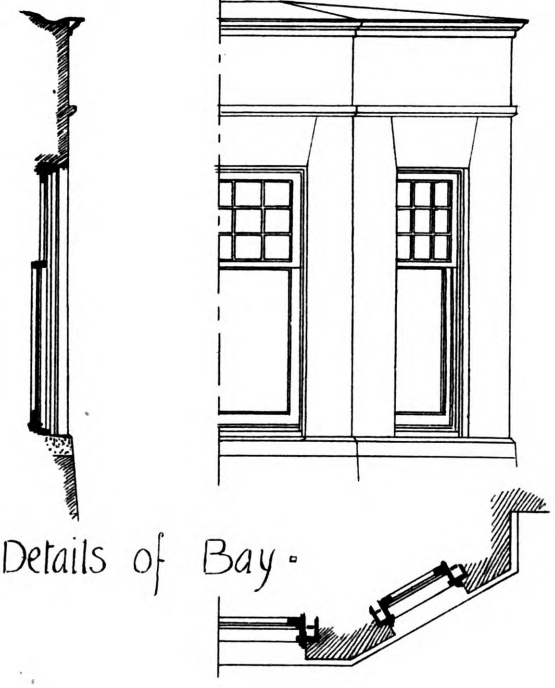
"BRICK-BUILDER" COMPETITION No. 7

East Elevation

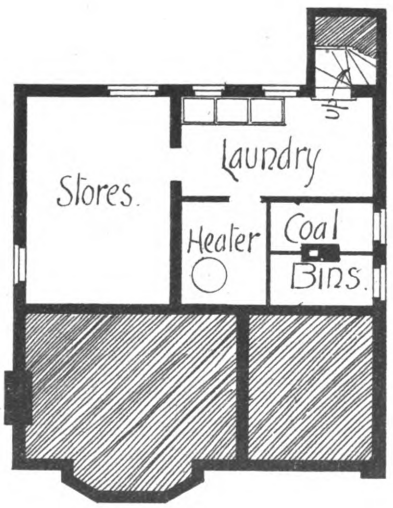
North Elevation

Scale for Plans and Elevations 5' 10' 15' 20' ft.

Scale for Details 12 In. 1 ft



Details of Bay



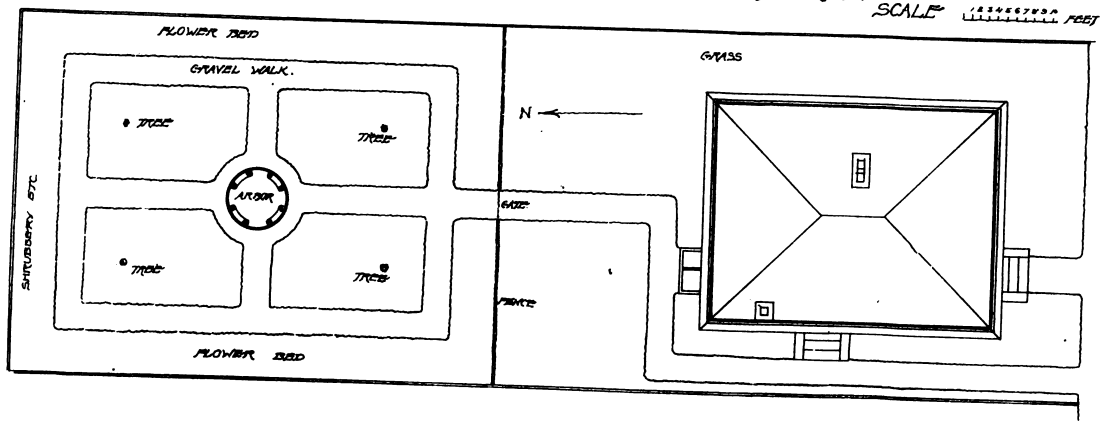
Cellar Plan

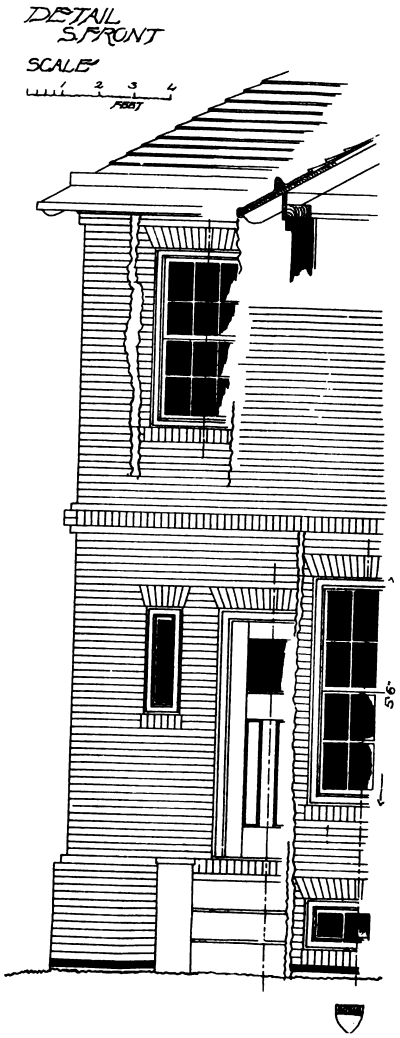
"Demos"

THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

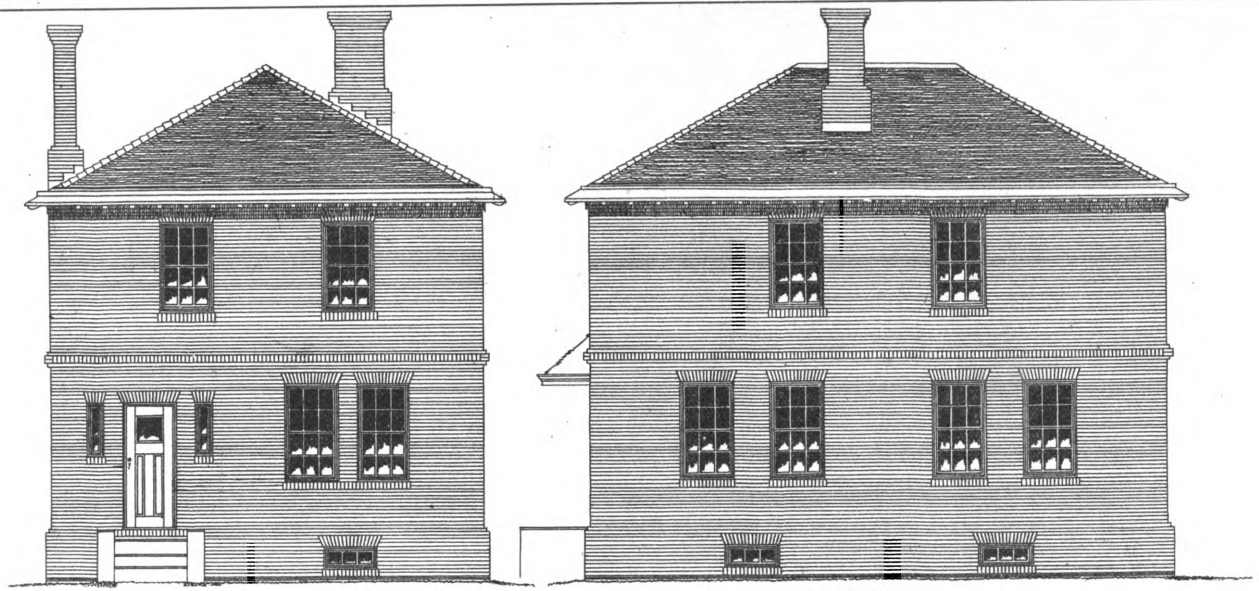
DESIGN BY ARTHUR E. WELLS, BROOKLYN, N. Y.

VIEW FROM S.W.





THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE



SOUTH FRONT.

EAST SIDE.

A BRICK HOUSE TO COST $2,000.00

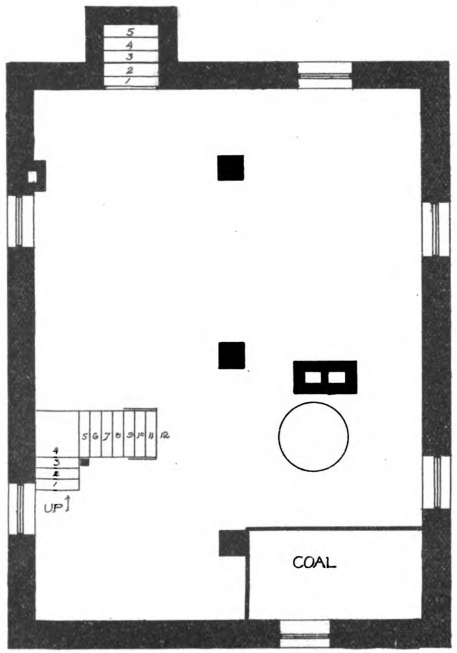
EXCLUSIVE OF FURNACE AND PLUMBING.

NOTES:—

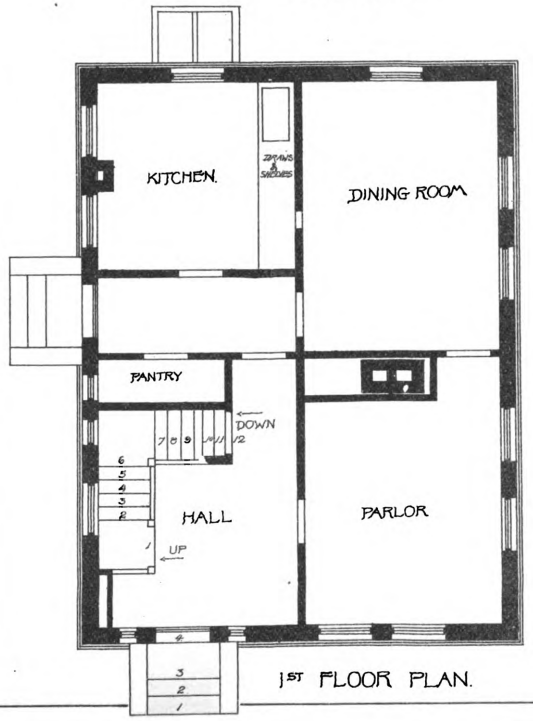
EXTERIOR
WALLS COMMON BRICK IN WHITE MORTAR, SILLS STRING COURSES AND CHIMNEY TOP IN CEMENT.
DOORS - BRONZE GREEN
WINDOW FRAME & SASH } IVORY WHITE
CORNICE
ROOF SHINGLES STAINED MOSS GREEN.

INTERIOR FINISH
• HALL & PARLOR WHITE WOOD TO BE IVORY WHITE •
• KITCHEN WHITE PINE •
• OTHER ROOMS WHITEWOOD NATURAL FINISH NO MOULDINGS TO BE USED •

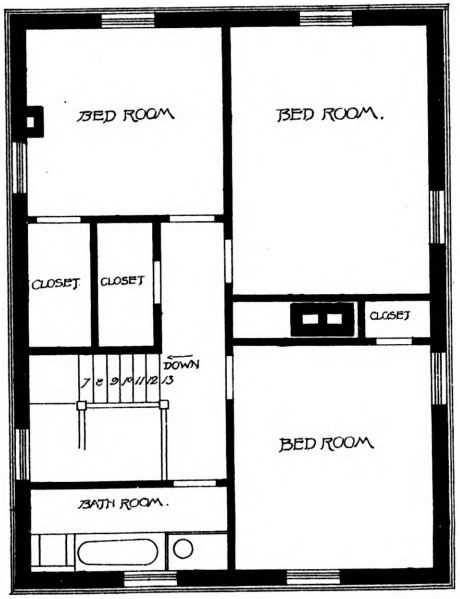
SCALE
1 2 3 4 5 6 7 8 9 10 11 12 13 14
FEET



CELLAR PLAN.



1ST FLOOR PLAN.



2ND FLOOR PLAN

THE BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

San Zeno are, to my mind, some of the most beautiful I have seen. The arches are of brick, pointed on two sides of the quadrangle and round on the other two, and on one side is a small projecting arcade; they are without mouldings, and are supported on coupled columns of red marble.

The arcading of San Fermo Maggiore may also be mentioned; and strolling along the narrow streets of the city numerous interesting bits of brickwork will be discovered. There is one special characteristic of the treatment of brick and stone in Verona, namely, the introduction of narrow courses of bricks between the arch stones and the plain walling, or between two rings of voussoirs. This serves to accentuate the arch and to keep it distinct from the main body of the wall, and is an effect that might well be imitated in our own buildings. Venice, which of course has a charm all its own, is not very rich in examples of brickwork; or rather, perhaps, I should say that the examples are not of such excellence as in other Italian cities. The church of the Frari is one of the most interesting examples, and there are one or two early campaniles in brick, San Giacomo del Rialto being the best. San Giovanni e Paolo, or Zanipolo as it is called, has an elaborate cornice. It would be both easy and interesting to devote some time to the description of the Italian cities such as Brescia, Mantua, and especially Cremona; but these would almost demand an evening for themselves. There is, however, one Italian city which must not be passed over, as it is built entirely of brick — I mean Bologna. The first view of its heavily arcaded streets is undoubtedly somewhat depressing, but the student of brickwork will find any number of most interesting details. The magnificent Church of San Petronio is almost entirely of brick both inside and outside, and is most impressive from its grand proportions and the excessive simplicity of all its details. There can be little doubt that this church exercised considerable influence over Street, as is shown in some of the late churches which he built. But it is for its domestic work that I think Bologna most interesting, as it shows us with how little trouble and expense we can increase the architectural effect of our plain brick buildings.

In our own country, after the Roman occupation terminated, very little seems to have been done in brick until the fifteenth century, although there is one building — Little Wenham Hall, in Suffolk — which dates from the end of the thirteenth century. The bricks here are interspersed with stone and flint courses, and the bricks are of widely different shapes and sizes, and when I visited the building a few years ago I came to the conclusion that it is very probable the bricks were not made purposely for the building. In the eastern counties bricks were largely used during the fifteenth and following centuries, one of the finest examples being Layer Marney Hall, Essex, which has been frequently illustrated. Who was the architect of this building is not, I believe, known, but he was certainly a man of considerable ability, and, I am disposed to think, familiar with some of the Italian terra-cotta work, as not only in the main building, but in the outbuildings also, there are several charming little bits of moulded brickwork. Sutton Place, near Guildford, is a beautiful example of brickwork; but here the influence of Italian Renaissance is manifest, and there can be little doubt that Italian workmen were employed on this building. The detail is pure, the ornament refined.

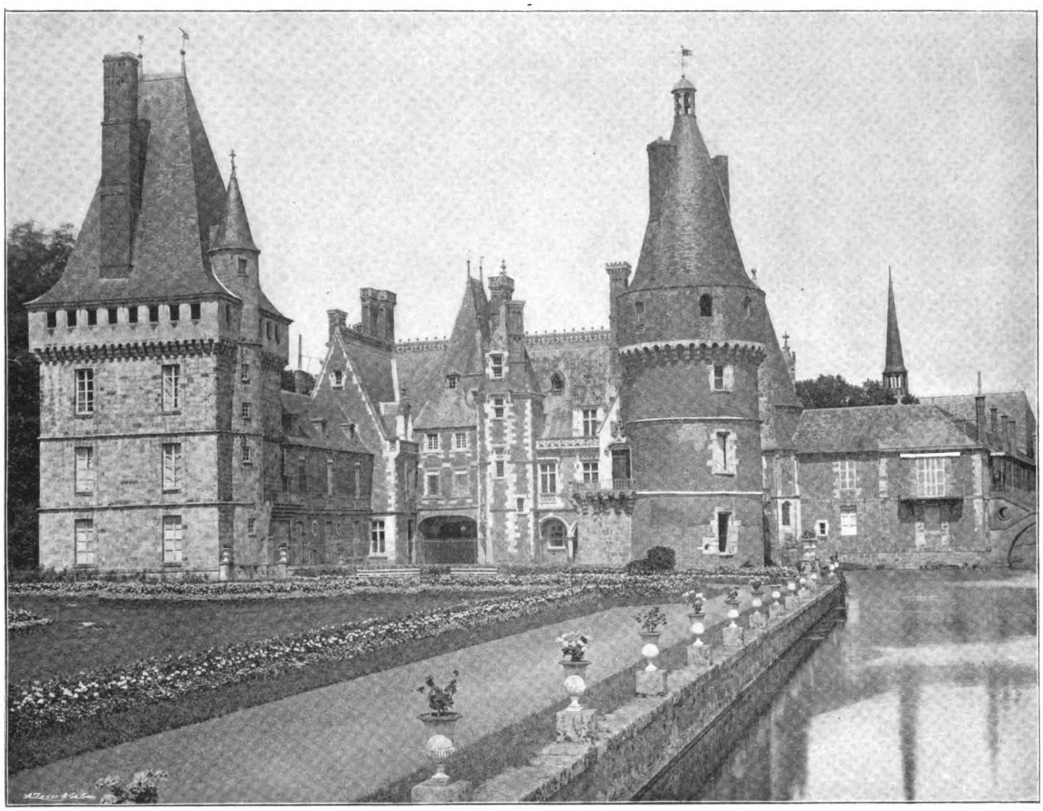
In Queen Anne's reign English brickwork was under the full domination of the Renaissance, and truly wonderful was the result. As far as workmanship goes, it is admirable. Pilasters, cornices, panels, swags, bunches of fruit and baskets, and, in fact, every imaginable detail, were formed of cut bricks, with an ingenuity and at a cost of labor that almost excites one's pity. I quite admit the charm of some of the older and simpler forms of this style that are met with most frequently in old country towns where age has given a mellowness to the work, and where nature has so often added to the picturesqueness by the creepers which have overgrown the exterior; but of the later developments of the original style and of the modern imitations of it, what can we say? I am aware that I am on somewhat delicate ground here, and I feel perfectly that my own opinion is a mere personal matter and worth no more than any other person's; but I can only say that much of the modern brickwork in imitation of the Queen Anne style fills me with horror and detestation. When I see pilasters tacked on to a front which not only have an exaggerated entasis at their sides, but come bellying out in front like the sails of a ship, they remind one of the fable of the frog and the bull, and the bricks seem swollen with conceit at having attained to a form utterly foreign to their nature; and it is this, rather than the ugliness, which I so strongly object to.

Brick is a hard material moulded and baked in a kiln, and moulded bricks seem to me perfectly legitimate; but surely the original baked surface is the most fitting to resist the weather; and if you go and rub and cut all the surface off, and then give the material a shape and form utterly foreign to its nature, you are completely reversing the practice of the mediæval builders, who have left us the most magnificent examples of their skill, and who invariably gave to each material they employed the ornamental treatment which it was best fitted to receive. Much of this modern treatment of brickwork seems to me on all fours with, and just as reprehensible as, the practice which prevailed in the early part of the century in London houses, where we find a small porch carried by what appears to be a solid stone column of the Doric order, but which turns out to be constructed of wood bent to a circular shape and kept there with an infinity of trouble. In each case the material has been tortured, and bears on its face the imprint of its suffering. And this brings me to the concluding portion of what I have to say to you this evening, which relates to the actual materials with which our brickwork is constructed — the bricks and mortar.

I am not going to take up your time with any description of brickmaking, except to point out the danger of using bricks pressed into shape by heavy machinery. My experience is that these pressed bricks, though having a fine smooth face, are very liable to flake and spall off at the angles, and I believe the reason to be that the outer layers of the clay in the brick get more closely compressed than the inner ones, and consequently the brick itself is not homogeneous. Another drawback to machine-made bricks is that machinery has enabled far inferior materials to be employed than was the case when only hand labor was in use, and consequently small pebbles are ground up with the clay and have a tendency to cause the brick to blow. The following are the characteristics of a good brick: 1. It should be regular in shape, so that when built into the wall the pressure over its whole surface shall be equal; 2. It should be tough and not brittle; 3 It should have a clear metallic ring when knocked gently against another brick; 4. It should show a homogeneous surface when broken; and 5. It should absorb only a small quantity of water. This lastis a most important matter, and although a brick can be tested for this with great ease, it is too often neglected. All bricks, of course, absorb some water, but the amount should not exceed from 10 to 15 per cent of the volume of the brick, and those are the best bricks which absorb water slowly, because when built into walls bricks are subjected to intermittent wettings only, and not to continual immersion in water. The same thing applies to stone, but I am aware of no experiments which have been made to test, *not* the total absorption, but the rate of absorption of water by bricks and stones.

There is one little practical matter that must not be overlooked in brickbuilding, and that is, if you have different bricks for facing and for the main body of the wall, care must be taken that the two kinds are not very different in thickness, otherwise the discrepancy will have to be made up in the mortar joints, and you will get inequality of pressure that will certainly result in cracks. The crushing strength of bricks is an important matter, but you must bear in mind that the crushing strength of a brick and of brickwork are two very different things. The figures given for the crushing strength of bricks vary in different text-books. In the third volume of *Building Construction* the crushing strength of a London stock brick is given at 128 tons. This is certainly a very gross error. In order to get some fresh information on this point, my friend Professor Unwin, of the technical Institute at South Kensington, was kind enough to test some bricks for me a few days ago, and I witnessed the experiment. A Leicester brick (Ellis, Partridge & Co.) did not even crack until a load of 63 tons was placed on it, and it crushed just under 68 tons, which was equivalent to a load of 245.8 tons per square foot. A hard Coventry brick, which was cut in half before testing, cracked with a load of 29½ tons on the half of it, and crushed just under 32 tons, equivalent to a load of 217.7 tons per square foot. An average specimen of a London stock full size cracked at 24 tons and crushed at 34 tons, equivalent to 125 tons per square foot, and this may be taken as a fair average for this kind of brick. I thought it would be interesting for you to see how a good material, whether brick or stone, crushes, and I have therefore brought the remains of one or two of the bricks. A bad material breaks up on all sides, a good one takes a pyramidal wedge-shaped form on top and sides, as you see. The hardest brick Professor Unwin has tested was a blue Staffordshire, which only cracked under a load of 107 tons, which is equal to a load of

385 tons per square foot. A 14-inch wall carried 68 feet high, which is, of course, higher than would be safe, would exercise a pressure on the lowest courses of about 3⅛ tons per square foot, so that, you see, there is very little danger of the bricks themselves crushing; but the interposition of the mortar joints in brickwork makes a vast difference, and you ought not to calculate as a safe load on brick piers more than about 3 tons per square foot in mortar and 5 tons in cement, and this is approximately about one tenth of the crushing weight. JOHN SLATER.



By Permission of The Clay-Worker.

THE CHATEAU OF MAINTENON.

Most of the chateaus of France are of stone. Stone was the material which could be taken out of the ground and be readily formed in the shapes required in building structures. A great deal of the stone of France is exceedingly soft when taken out of the quarry, so that by little physical effort it can be easily shaped to conform to the requirements of the architect and artist. However, in some instances, we find among the best structures of early times a liberal use made of brick. In the chateau which is presented herewith, we find brickwork playing an important constructional part. The stone is used decoratively, yet brick is used to secure color and general form, and the result, as we see in this photographic print, which is made from a chromatic plate, shows the color values or color qualities of brick as related to stone and other material. Just what is meant by color values may be illustrated by the flowers in the vases along the wall. While the colors of the flowers do not show, the relative color values do show; thus it is in the brickwork, the stonework, and the slate that we have in this photograph, an exhibition of the color qualities or the color values as the different materials are related one to the other. The liberal use of stone in this structure illustrates clearly enough that brick was selected because of its artistic value rather than through absolute necessity. No advocate of brick building can hope to secure the use of brick as a building material excepting for good and sufficient reasons. In a country far removed from the brick market, the effort to secure the use of brick material when stone is at hand would not be commensurate with results. Yet in this case it would be a good deal easier and quite as cheap to get stone as it would be to get brick building material.

We have said that stone in this structure was of a character to admit of its ready use in a decorative way, because it was soft, and for that reason readily fashioned into the forms which come to the mind of the artist. In our country we have no stone which lends itself so readily to the hand of the artist as does the stone of France. However, as far as enduring qualities are concerned, we have stone which is superior. On the other hand, our knowledge of the use of clay as a building and decorative material is such as to allow us to use clay products in the same artistic way, in the same decorative manner, and with the same freedom as did the artists and architects of France in handling their soft stone.

Stone with them was as plastic to the mind as is clay to the hand of the American artist. It must be borne in mind that in order to get artistic work in brick or other forms of clay, that it must be done by the artist. The artist must be the directing forces It must be his hand or his mind which acts directly upon the building material, and hence produces artistic results. Handicraft if necessary. Handicraft is not enough. It is to the interest of

every brickmaker in America that artistic talent be developed looking to the handling of clay products. The material which best lends itself to the hand of the artist, and the material which receives the most artistic handling, is that which will receive the best patronage from the people. There is nothing which pays so well as the artistic handling of any natural material. It adds more value for the investment than can be secured in any other way. We can illustrate this when we bear in mind that raw material of any kind does not cost relatively a great deal of money. Yet, when put into attractive forms through the direction of artistic minds, it takes to itself the value proportionally larger in excess to the difference in actual investment. The large profits are represented by the difference between the mere handicraft, mere constructional form, and artistic form.

American architecture will develop itself through the medium of clay. There can be no doubt about this. The tendency in stonework is in the wrong direction. Stone carving is done by stone cutters, not by stone artists. Artists in stonework are rare. In fact, the difference between a stone cutter and a sculptor in doing decorative architectural work is not recognized in the stone yards of America. A man who is clever with his tools and can get decorative work has the opportunity of doing the work which should otherwise be assigned to an artist. In nearly every terra-cotta manufactory of America one finds modellers who are possessed of the artistic training and artistic enthusiasm which is necessary to the highest results. The best work from an artistic standpoint which has been done in America during recent years has come from the clay-worker. We have Frenchmen, Italians, Germans, and Englishmen, in whom have been cultivated the artistic instinct, and who have directed their attention to the modelling of clay in artistic forms, and because of the acquisition of such talent in this field, the statement as made is unquestionably true.

We have stated before that the stonework of France as handled is terra-cotta construction. Anything which is built in stone in that section can be constructed in terra-cotta. It is terra-cotta construction rather than stone. The stone is in small pieces because of its structural qualities, and, for that reason, the forms which are shown in this photograph all lend themselves naturally and properly to terra-cotta forms. — *Clay-Worker.*

CORRESPONDENCE.

GLAZED OR ENAMELLED BRICK FOR KITCHENS.

In our October issue, P. D. Reefy, M. D., of Elyria, Ohio, inquired as to what material could be used to advantage for finishing the interior of a kitchen. Enamelled bricks are satisfactory in every way, and are often used. Many brands of enamelled bricks are imported from England, and of these the famous "Farnley" brand are handled by Meeker & Carter, of New York; Chas. R. Weeks & Bro., of that city, handle three good brands of English bricks. But both the Griffin Enamelled Brick Co., Times Building, and E. Thomas Lynch, 54 East 23d Street, New York, make a first-class American enamelled brick fully equal, we think, to the English, if not superior. The former make the "Griffin" brand, the latter makes the "Matawan" brand.

MIXING COLORED MORTARS, ETC.

C. C. Buck, architect, Albuquerque, N. M., inquired in our October number for information regarding the mixing of colored mortars, cleaning down brickwork, and other points. Prof. Ira O. Baker's book on Masonry Construction is a manual of the soundest character, and should be in every architect's library. It gives about all the information desired. On the first point, let our correspondent write for information to any of the leading mortar color makers, Samuel H. French & Co., or Pecora Paint Co., Philadelphia; Chattanooga Paint Co., Chattanooga, Tenn.; Clinton Metallic Paint Co., Clinton, N. Y.; Ricketson Paint Works, Milwaukee, Wis., etc., etc. They can give him information of direct and practical use.

BOSTON, Dec. 30, 1892.

EDITOR OF THE BRICKBUILDER.

Sir, — I see in the October number of THE BRICKBUILDER that you ask suggestions from architects as to how to secure a good series of stock mouldings from the brickmakers.

I suggest that you offer a prize of some sort for the best twelve full-size mouldings for standard use, and other prizes for additional ones if necessary, or, in fact, arrange any way which you think best, and to get the architects to think out in full size the mouldings that they would like to have standard. It is the right way, I believe, to get at the end in view, or any end. Probably the prominent firms of brick masons would be willing to offer a very handsome prize for this purpose. The competition might be dignified by passing through the hands of the Society of Architects in some way.

Faithfully yours,

ROBERT D. ANDREWS.

4 LIBERTY SQ., BOSTON, MASS.

EDITOR OF THE BRICKBUILDER.

Dear Sir, — Can you inform me where I can get information as to the tests to be made to determine the value of a deposit of fire-clay? Any information as to books or individuals from which I can obtain this data will be appreciated.

Yours truly,

WM. A. PIKE.

THE BRICKBUILDER COMPETITIONS.

RULES: All drawings must be sent in marked with some motto or device, and accompanied by a sealed envelope marked with the same, containing the full address of the competitor. The designs are judged by a committee of well-known architects, solely upon their merits, the names of the designers remaining unknown until the award is made, when the sealed envelopes corresponding to the devices on the designs are opened. To protect the interests of our advertising patrons it is stipulated that no ornamental bricks not found in their catalogues shall be used. This is really no restriction, for practically all of the leading manufacturers will be found represented in THE BRICKBUILDER. To encourage the study of effective use of the commoner materials, of two designs equally good, preference will be given that showing a skilful use of ordinary bricks to secure ornamental effect.

REPORT OF THE JURY.

BRICKBUILDER COMPETITION FOR A $2,000 BRICK HOUSE.

One of the most encouraging facts of this competition is the great variety of treatment which has been given to so simple a problem as the one before us. Owing to this variety and the good quality of most of the designs sent in, it was not an altogether easy task to select the best four, and no attempt has been made to place these four in order of merit. After careful consideration it seemed to the jury that the designs marked by *an eagle*, *T square and triangle*, "Plain Jane" and "Stanley," gave the best solution of the problem. The first-named design is excellent in its interesting character, its straightforward simplicity, and good proportion. The L might have to be done away with to bring the house within the required cost. The coats of arms on each side of the doorway are hardly appropriate unless we are to suppose that this is the abode of some decayed scion of nobility. The arrangement of the lot is good.

T square and triangle gives another good and commendably simple solution of the problem. The small side opening of the porch would be better suppressed. It is too insignificant, and is not really necessary. "Plain Jane's" general idea is unusually attractive, but is not as well worked out as it might be. The arched windows come too near the edge of the gable for best effect, and the same criticism applies still more strongly to the dormer in the north elevation. It would be difficult to construct this dormer and prevent the ceiling from cutting across the sides of the arched window. Leaving the window where it is, the stepped gable over it should be raised by about the height of one of the steps. The arrangement of the lot, which is assumed to be a corner one, is well brought out. "Stanley's" design has a very cosey and homelike air, and the brick patterns are well used. It would be improved by removing the useless buttress placed against the bay-window merely to correspond with the constructional buttress against which the arch of the porch abuts. Structural members introduced for other than structural reasons always injure a design.

The designs by "Whiz," "Demos," and *Shield* also deserve special commendation. The latter is to be commended for its straightforward simplicity, but it is a little more bald than need be and, therefore, not as interesting as some of the others submitted. The treatment of the lot is especially good; but it would have been better to

have entered the garden directly at the side rather than by a right-angled bend. If it was designed to enter the garden on its axis, the plan of the house should have been so modified as to bring the back door directly opposite the central garden walk. The very attractive design of "Whiz" would have received a higher place but for a serious practical defect: the sills of the second-story windows are placed about four and a half feet from the floor. The brick diaper is out of place in the base course, where the eye requires an appearance of strength, which such a diaper lacks. The treatment of the lot is also very poor. It is utterly without design, properly so called, and would be very ugly in execution.

NOTES ACCOMPANYING DESIGN FOR A $2,000 BRICK HOUSE SUBMITTED BY "DEMOS."

ARTHUR E. WELLS, BROOKLYN, N. Y.

It has been assumed that the lot faces the west.

In order that the building should not exceed the cost limit, the plan has been kept a simple square and all irregularity avoided.

It will be noticed that no room is dependent on windows placed in a side wall where the light and view might be obstructed by an adjoining building.

The arrangement of the rooms affords a south and west aspect to the living-room, while the dining-room in connection has the benefit of the early sun at the breakfasting hour.

The kitchen, by the arrangement of its windows, has effective cross ventilation, and the placing of the pantry doors shields it from view from the dining-room.

Provision has been made for the plumbing fixtures in positions in which they will be well lit, and may be grouped about a single stack of pipes and the system thus rendered simple, cheap, and effective.

The exterior has been treated in brick throughout and in the simplest manner.

The brickwork is intended to be of a rough character.

The bricks themselves should be hard-burnt, but may be rough and crooked, and vary in color from a bright red to a dull black. They should be laid as they come to hand, and jointed with a "struck" joint.

A treatment such as this would give to brickwork a play of light and shade that would make it almost equal to rough stonework in artistic effect, while it would have the advantage of being very inexpensive.

The roof is intended to be shingled, and it should be left to assume a soft tone of gray under the action of time and weather.

If the house were surrounded by foliage and covered with ivy, the external effect would be complete.

For the interior the author would use a simple classic trim for doors and windows, and mouldings of classic form throughout.

The stairs should be constructed with an open string and the balustrade composed of a simple hand rail carried on one inch square balusters spaced four to a step.

The balustrade should be of some hard wood and might be finished in natural color.

The trim, etc., throughout had best be painted in light colors to harmonize with the decoration in the various rooms.

The cellar windows, the high windows in living and dining rooms, and the stair window are casements; all other windows throughout are of the ordinary box frame type.

NOTES ACCOMPANYING DESIGN FOR A $2,000 BRICK HOUSE SUBMITTED BY "TERRA CUITE."

C. HOWARD LLOYD, BOSTON, MASS.

The accompanying design was intended to follow in a general way the prevailing style of dwelling-houses in England. The second story of the building, as will be seen by the west elevation, is of half timber construction, and cannot fail in producing a picturesque effect. All of the first floor, as well as the entire north and south elevations, are constructed of brick (common) laid up in Flemish bond, and in white mortar, with moderately thick joints. It would add to the effect of the whole if the headers had a slightly darker color than the stretchers. The roof is covered with dark green shingles. Leaded white glass and casement windows are sometimes employed.

The first story is 9 feet high, the second also 9 feet. All joists are to be 3 inches by 9 inches.

This house will cost, exclusive of heating and plumbing, according to the author's estimate, about $1,900.

First floor finished in natural pine, the second, paint.

NOTES ACCOMPANYING DESIGN FOR A $2,000 BRICK HOUSE SUBMITTED BY "EAGLE IN WREATH."

JAS. C. GREEN, ST. LOUIS, MO.

The author of the design has submitted plans to a reliable contractor in St. Louis, Mo., who states that the building can be built easily within the limit, using a gravel roof and omitting plumbing and heating. The outside vestibule in green oak; main hall curly pine; parlor, dining-room, and bedrooms in painted pine; kitchen, pantry, and bath-room in long-leaf yellow pine, hard oil finish — wainscot in bath-room & beaded yellow pine, five feet odd inches high. No wainscot elsewhere. Hard wood floor in hall, earth floor in basement.

COMPETITION NO. 9.

A PEN DRAWING OF BRICK DETAIL.

Programme. In view of the fact that during the coming year the publishers of THE BRICKBUILDER purpose using a large number of illustrations, chiefly pen drawings, in the reading matter, it has been decided to offer a competition for the rendering of brick details, in pen and ink, in hopes that new talent in this line may be brought to their attention, and make it possible to secure a larger staff of illustrators. It is particularly desired to have at least one good draughtsman in each city upon whom the publishers may call for illustrations of local brickwork.

Competitors may choose their subjects, taking a photograph, print, or sketch to work from, but it is stipulated that nothing already published in THE BRICKBUILDER shall be used. Any detail, such as a window, bit of cornice, gable, chimney-top, or dormer, may be taken, and the taste shown in the selection will be considered in making the award. Mr. D. A. Gregg has consented to judge the drawings.

For the best five drawings prizes of three dollars each will be given. Any others that may be acceptable will be paid for at one dollar each, and after publication returned to the competitors. Drawings must be made on *smooth* cardboard, not larger than five by seven inches, and mailed to THE BRICKBUILDER, P. O. Box 3282, Boston, Mass., by Feb. 13, 1893.

THE BRICKBUILDER FOR 1893.

It rarely happens that a periodical attains perfection with its first issue, or even its first year. No matter how much thought its editors and publishers may have given to its preparation, the first issue in some way fails to reach their ideal; and so it is to a great degree with each succeeding issue until the policy of the paper becomes thoroughly fixed. As each number comes from the press, it suggests some improvement to be made in future numbers. These improvements may be made from number to number, or they may wait until the close of a volume, or a year offers opportunity for sweeping changes, when the publication may be wholly remodelled. In our own case we have taken a middle course, making what we believe to be improvements from time to time, but reserving decided changes until the beginning of a new year. The indorsement of subscribers by the renewal of their subscriptions for 1893 has been so general that we conclude the policy of the past year has, on the whole, met with approval. While, therefore, following the same general lines, it is proposed to broaden our field and cover the use of all kinds of clay building materials. Terra-cotta, equally with brick, will come in for greatest attention, but considerable space will be devoted to roofing tiles, glazed and enamelled products, fireproofing, limes, mortars, and cements, and other subjects directly in our field.

The principal changes outside of additional matter will be in typography and arrangement. The use of illustrations in the letter-press will be a regular feature, and these will be by the best draughtsmen. As in the past, a large proportion of the matter will be original and written expressly for THE BRICKBUILDER, only articles of direct bearing on our subject being reprinted from other journals, full credit being always given in such instances. The plates, to the number of eight or more, will occupy the middle of the paper, and these will be largely scale drawings of brick and terra-cotta work, while the illustrations in the letter-press will be perspectives and sketches of detail, or reproductions of photographs. Non-subscribers are respectfully referred to the opinions of subscribers printed on the third cover page.