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CONTENTS.

SUMMARY: —
Report on the Anthracite-coal Strike by Carroll D. Wright, Commissioner of Labor. — Investigation into the Corrosion of Steel-frame Construction by the Insurance Egineering Experiment Station. — Structural Steel surrounded by Masonry. 25
THE AMERICAN VIGNOLA. — X. 27
URALITE. 29
THE FABRIC FUND OF WESTMINSTER ABBEY. 29
ZIMBABWE RUINS. 30
IRON AND STEEL SLAG. 31
BOOKS AND PAPERS. 31
ILLUSTRATIONS: —
Circular Greek Temple, Tiverton, R. I.—Nos. 13 and 15 Beacon St, Boston, Mass. — House for Arthur W. Pope, Esq. — Dining-room for Oliver W. Mink, Esq., Manchester-by-the-Sea, Mass. — Superposition and Intercolumniation.
A View in Charleston, S. C.
Additional: Lawn Front: House of Edward J. Berwind, Esq., Newport, R. I. — House of William H. Oakes, Esq., Waban, Mass. — Choir Details: All Saints', Great Neck, Long Island, N. Y. — Details of Rood-screen: All Saints', Great Neck, Long Island, N. Y. — Details of Reredos: All Saints', Great Neck, Long Island, N. Y. — Altar and Reredos: All Saints', Great Neck, Long Island, N. Y. 31
NOTES AND CLIPPINGS. 32

ONE of the most interesting public documents ever issued is Mr. Carroll D. Wright's report on the anthracite-coal strike, which forms the most important portion of the November Bulletin of the Department of Labor. In this admirable paper Mr. Wright appears at his very best, as an experienced and considerate official, skilful in ascertaining the truth, and ready to do justice to both sides. As those who have read the newspaper accounts of the statements of both sides will readily infer, the trouble is, apparently, due, in great part, to prejudice and misunderstanding, on the part of the operators as well as of the miners. As Mr. Wright shows, the dissatisfaction of the miners is to be attributed, in a considerable degree, to petty injustices and oppressions on the part of foremen and overseers, and, even of these, many are unintentional, and are to be attributed to the ignorance, on the part of the miners and the foremen, of each other's language. Overseers of this class are notoriously disposed to be unreasonable and tyrannical, and any one who has seen an Irish foreman bully a squad of Italian laborers can easily imagine that a gang of Italian, Hungarian and Russian miners, incapable of understanding their overseer, or of making themselves understood by him, would soon lay up a long list of grudges against a foreman of the ordinary type. In the mines, the case is made worse by the fact that deduction is made from the miners' wages for stone in the coal that they get out; and, as this deduction is, apparently, left wholly to the judgment of the overseer, it is, naturally, impossible to avoid some appearance, at least, of oppression and unfairness. If the operators were willing to interest themselves in the working of their own mines, and show themselves ready to listen to complaints, and to remedy injustice, Mr. Wright thinks that they would get loyal and faithful service in return; but they choose, apparently, to take the attitude that their men are their slaves, and talk about "discipline," exactly as a Southern planter, before the Civil War, would have discussed the problem of keeping unruly negroes in subjection; while, unlike the Southern negroes, whom their master was obliged to feed and clothe at all times, the anthracite miners are liable at any time to be turned adrift, by the closing of the mine, without any explanation, and, so far as they can tell, simply at the caprice of the operators.

IT is not surprising that this method of carrying on the business of anthracite mining should have brought about a state of things in which, as Colonel Wright says, "suspicion lurks in the minds of every one, and distrust in every action on either side"; and it is obvious that the operators, as the more intelligent class, are chiefly to blame for this. Under such circumstances, the idea of organizing the miners was brought forward, and here, again, a worse misunderstanding than ever arose. To the more sensible miners, and to a great many intelligent persons who, although not engaged in the business, were familiar with the conditions, it seemed as if an organization of this sort would enable the operators and their men to make definite agreements in regard to disputed points, such as the percentage to be deducted for rock, the standard size of car to be loaded by the men, and other matters, about which there was constant, and not entirely unreasonable, dissatisfaction; and it was thought probable that such an organization would be an effective means of keeping in order the ignorant foreign miners, who have no idea of the meaning of a contract, and rebel against the control of the foremen, whom they regard as their natural enemies, but whose loyalty to their fellows, which is a strong feeling among them, would lead them to obey the mandates of their own organization. There is a good deal to be said in favor of this view, but the operators jumped at the conclusion that an organization of this kind would destroy discipline; that its agreements would not be respected, and that it would be managed by the worst elements among the men. It is possible that all these results might follow the association of the anthracite miners, but it is, to say the least, not proved that they would do so, and the miners, who seem to have had a high ideal of their proposed organization, conceived the notion, which, from their point-of-view, was as reasonable as that of the operators, that the latter did not wish to make any agreement with the men, for fear of limiting the caprice and tyranny which the men attributed to them. This was exactly the state of things which a little courtesy and fairness might have brought to an amicable conclusion, and the operators are certainly to blame for not being willing to show these virtues. According to Colonel Wright, the conditions which the men ask for are not unreasonable. The operators say that if the demand of the miners for increased pay is granted, the cost of anthracite coal to the public will be increased sixty cents a ton. Fortunately, the public is quite aware that the price of coal is regulated, not by the wages paid to miners, but by what those who want the coal are willing to pay for it; and, as a matter of fact, Colonel Wright says that what the miners want is not so much an increase in their wages for the time that they work as relief from that curse of American industry, enforced idleness. He says, no doubt with reason, that "if the men could be sure of steady work, or fairly steady work, they could well afford, perhaps, to take less wages, or even to continue on the present basis of payment"; and it is understood that many of the men take this view. It is hardly necessary to point out that an increase in the number of days during which the men work would, naturally, result in an increase in the output of coal, and, presumably, in a reduction of the price; so that the interest of the public accords in this respect with that of the miners. Even the operators need not, it would seem, view this contingency with alarm. As they say, the wages paid to the miners for getting out coal form a small part of its cost, the rest being made up of interest payments, maintenance of machinery, expense of pumping, salaries of overseers and officials, and many similar items, which accumulate just as rapidly when the mine is worked six days in the week as when it is worked only four; and the obvious inference is that if the miners were employed continuously, instead of intermittently, the cost per ton of the coal produced would be much less that it is now, and the operators could, with profit, sell it to the public at a lower price, at the same time that they improved the condition of their men. All these points might properly, and with advantage, be investigated by an impartial commission; and, while there is, undoubtedly, much truth in what the operators say of the folly and tyranny of the unions, it may be presumed that such a commission would appreciate unreasonableness on the part of the miners, as well as on that of the operators.

THE Insurance Engineering Experiment Station has issued a Report, Number Four of its series, on the Corrosion of Steel Frames of Buildings, which is the most important contribution to the science of building which has appeared for many years. We need not say that, although many millions of dollars are expended upon steel-frame construction every year, no one has yet been able to give convincing proofs that buildings of this construction would last through more than one generation; and the warning of a very distinguished engineer, that, judging from his experience, few of them would reach their twentieth birthday, has never yet been met with anything better than mere assertion, unsupported by rational evidence. Under these circumstances, the Experiment Station undertook the task, not of testing steel frames under conditions exactly

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similar to those to which they would be subjected in actual buildings, for the obvious reason that such a test would require several years' observation, but of imbedding structural steel in masonry, similar to that used in this system of construction, and exposing it to the action of moisture and carbonic acid in a more energetic form than that in which they present themselves in an ordinary atmosphere. As it is generally admitted that carbonic acid and a moist atmosphere are the active agents in corroding steel, the problem resolved itself into applying these agents in a concentrated form, so that their effect would be visible within the few weeks which could be devoted to the experiment; and, for this purpose, mixtures of steam and air, air and carbonic acid, and steam with carbonic acid and air were employed.

THE steel to be tested was in the form of expanded-metal lathing, steel rods, and sheet steel. In order to avoid error in consequence of spots of rust on the metal, which, in the opinion of many engineers, continue to increase under a covering which would efficiently protect clean metal, all the pieces of steel used were first scoured, then "pickled" in hot dilute sulphuric acid; after which they were dipped in hot milk of lime, to neutralize the acid, and the lime finally removed with a wire brush. This treatment left the metal perfectly free from rust. The pieces were then imbedded in concretes of various kinds, made with Alpha and Lehigh Portland-cement, mixed with sand, broken stone or cinders in different proportions. The concretes were formed into blocks, or briquettes, each briquette with a piece of metal buried in it; and in all cases the concreting materials were mixed dry, again mixed after adding water, and thoroughly tamped. Two briquettes were made of each mixture. In all, several hundred briquettes were made, and were exposed to different artificial atmospheres, as well as to the ordinary air of the laboratory; and, besides the briquettes, pieces of unprotected steel were also exposed. After three weeks, the briquettes were cut open, and the imbedded metal carefully examined. In all cases, the unprotected metal was found so badly corroded as to be "more rust than steel." Of the protected metal, that which had been buried in neat Portland-cement resisted the trial best, every specimen, whatever the atmosphere to which it had been exposed, being taken from the briquette as bright as when it was put in. Of the other specimens, which had been buried in concrete of some sort, we are told that "hardly one had escaped serious corrosion," and it was found that "the location of the rust spot was invariably coincident with either a void in the concrete or a badly rusted cinder." In cases where the concrete was porous, the steel was "spotted with alternate bright and badly rusted areas, each clearly defined"; and it is interesting to learn that the specimens least affected, after those made with neat cement, were those in which the concrete had been mixed very wet, so that the almost liquid cement had splashed over the steel like paint, protecting the portions which it covered. Some subsequent experiments, suggested by this observation, showed that, by using finely ground cinders, concrete made even with two parts cinder to one part of Portland-cement could be so applied, presumably by mixing it very soft, as to protect the steel, provided there were no crevices or perceptible voids.

EXAMINATION of some specimens, brought in from outside, of expanded metal embedded in concrete, showed that wherever the concrete was cracked, the steel began to rust, even though the cracks were very fine, indicating that the protecting cement, to be of service, must be in contact with the metal, a separation, even of a few one-hundredths of an inch, making it useless. In connection with this, Professor Norton, the author of the deeply-interesting report before us, says that he had recently occasion to examine some Z-bar columns, which were exposed in altering a metal-framed building five years old. The columns had been painted, and were simply built into the brickwork. The columns showed evidence of having been rusty when painted; and the moisture circulating between the brickwork and the metal had penetrated the paint, and caused the rust to increase, so as to split off the paint. It is probable that, if the steel had been perfectly clean when it was painted, the paint would have protected it for much more than five years. How long it would preserve it no one can say; but Professor Norton points out that, if the paint should disintegrate and disappear, it would leave a void next the metal, "the worst possible condition." He therefore much prefers a thorough wash of cement, applied directly to the clean steel, to any paint; but he says that "if, as is often the case, the choice is between paint and rust which accumulates during construction, the paint is to be preferred." The conclusions which Professor Norton draws from these experiments are that "neat Portland-cement, even in thin layers, is an effective preventive of rusting"; that "concretes, to be effective in preventing rust, must be dense, and without voids or cracks"; and "should be mixed quite wet when applied to the metal"; that "the corrosion found in cinder concrete is mainly due to the iron oxide, or rust, in the cinders, and not to the sulphur"; that "cinder concrete, if free from voids, and well rammed when wet, is about as effective as stone concrete in protecting steel"; and that "it is of the utmost importance that the steel be clean when bedded in concrete. Scraping, pickling, a sand-blast and lime should be used, if necessary, to have the metal clean when built into a wall."

WE have quoted more freely, perhaps, than we ought from a paper which is the property of the Insurance Engineering Experiment Station, but its extreme importance, and the urgent need of placing its conclusions before the profession at the earliest possible moment, will, we hope, be received as a sufficient apology. Meanwhile, as the Experiment Station invites suggestions from architects in regard to these matters, we would like to observe that as anything like pickling is out of the question with structural members, not only on account of the impracticability of dipping ten-ton girders, or thirty-foot columns, in hot sulphuric acid, but, still more, on account of the certainty that some of the acid would creep in between the plates, or under the rivets, out of reach of a lime wash, and there cause destructive corrosion, those who have every day to write specifications for the treatment of structural steel would like very much to know of some more practicable method of securing an approximately similar result. Professor Norton advises, besides pickling, scraping and sand-blast cleaning. The sand-blast would not be much easier of application than the pickling; but scraping is not difficult; or, as in our own practice, the steel can be cleaned quite effectually with a stiff wire brush. With either scraping or the wire brush there will still, however, be left traces of rust, particularly in the joints, and it seems possible that a thin alkaline wash might render them harmless, without involving the difficulty and danger of acid pickling. The milk of lime, which is only feebly alkaline, and is too thick to penetrate the crevices where rust would be likely to hide, could hardly be depended upon for this purpose, but it seems possible that a dilute solution of silicate of soda, followed by a lime wash, might be effective, and such an application would be quite within the capacity of the ordinary iron shop. As architects cannot often make chemical investigations for themselves, we hope that the Experiment Station may find disposition and opportunity to study this development of the subject; and the practice of the old New York builders, who, in the days when structural steel was left exposed, always whitewashed their "Cooper beams," or their "Harper girders," before painting them white, to prevent staining from the corrosive action of white lead on the iron, may, possibly, suggest some alkaline application which could be put on at the rolling-mill, before the painting which is necessary to prevent rusting in transportation and from storage in open yards, and which would, after the paint was scraped off with a wire brush, leave a clean surface, or, if the paint should not be scraped off, might resist even the action of moisture from masonry in contact with the paint.

ANOTHER point which the Experiment Station might study with great advantage is the behavior of structural steel surrounded by masonry other than concrete. The only example of this sort which Professor Norton refers to is the rather alarming one of the Z-bar column built, five years before, into brickwork, which had rusted so much as to throw off the paint. As, in practice, the most important members in a steel frame are surrounded by brickwork or stonework, not by concrete, the question of protecting them in that situation is a most urgent one. We may say that, in our own practice, all vertical members surrounded by brick or stone masonry are grouted every foot in height, as the brickwork is carried up around them, with liquid cement; and some architects accomplish substantially the same result by plastering the vertical members before building up the masonry around them; but these precautions are not usual. Judging from Professor Norton's experiments, they seem to be desirable, but it would be interesting and important to know how effective they are in preventing corrosion, and whether there is any better way of protecting such members.

THE AMERICAN VIGNOLA.[1]—X.

PART I.—THE FIVE ORDERS.

INTERCOLUMNIATION, OR THE SPACING OF COLUMNS.

THE space between two columns, measured just above their bases, is called an *Intercolumniation*. It is one Diameter less than their distance apart on centres, or on edges.

Columns are said to be *Coupled*, or to have a *Pycnostyle*, *Systyle*, *Diastyle*, or *Areostyle* Intercolumniation, according as they are set close together, or are one, two, three or four diameters apart, as nearly as may be, i. e., about one, two, three, four or five Diameters on centres. The Systyle and Diastyle are the most usual, with an Intercolumniation of two or of three Diameters.

But Coupled columns cannot be nearer than $1\frac{1}{3}$ D. on centres, instead of 1 D., on account of the projection of their bases, and in the Ionic, Corinthian and Composite Orders, not nearer than $1\frac{1}{2}$ D., on account of the projection of their Capitals. The Intercolumniation of Coupled Columns is accordingly $\frac{1}{3}$ D., or $\frac{1}{2}$ D., or even a little more, to prevent the Bases or Caps from actually touching.

So also the Pycnostyle Intercolumniation is made $1\frac{1}{4}$ D., instead of 1 D. (i. e., $2\frac{1}{4}$ D. o. c., instead of 2), to avoid crowding. The ancients thought that even the Systyle columns with an Intercolumniation of two Diameters, came too near together, and preferred what they called the *Eustyle* Intercolumniation, of $2\frac{1}{2}$ Diameters (or $3\frac{1}{2}$ D. o. c. in place of 3 D.). But the moderns prefer to make the Eustyle Intercolumniation $2\frac{1}{3}$ D. (setting the columns $3\frac{1}{3}$ D. o. c.), as this brings every Column in Ionic and Corinthian colonnades exactly under a Dentil, and every alternate one just under a Modillion, the Dentils being $\frac{1}{6}$ D. o. c. and the Modillions $\frac{2}{3}$ D.

The wider Intercolumniations are preferable, obviously, when the columns are small, since otherwise it might be difficult to pass between them, and the Systyle, or even the Pycnostyle, when the columns are very large, since otherwise it might be difficult to find stone architraves long enough to span the interval. But the ancients used Tuscan Columns chiefly with wooden architraves, setting them as much as seven Diameters apart, which is called the *Tuscan Intercolumniation*, and which makes the space between the columns about square. In modern times also, an arrangement of coupled columns has been employed, called *Areosystyle*, the columns being set half a Diameter apart, and the space between the pairs of columns made $3\frac{1}{2}$ Diameters. This is greater than the Diastyle Intercolumniation and less than the Areostyle by half a Diameter. From the axis of one pair of columns to that of the next pair the distance is six Diameters. If in a Systyle Colonnade, with the columns three Diameters on centres, the alternate columns are moved along till they nearly touch the intervening ones, the result is an Areosystyle Colonnade. This was first used in the Eastern Colonnade of the Louvre (Fig. 151).

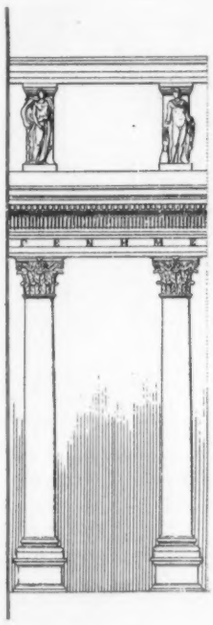

Fig. 150.

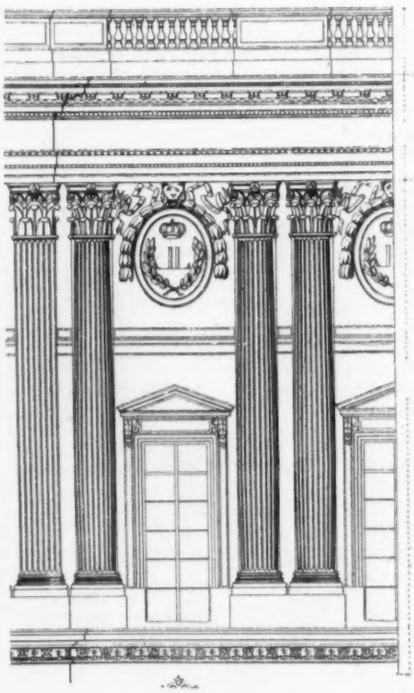

Fig. 151.
Colonnade of the Louvre.

In actual practice these rules for Intercolumniation are seldom exactly followed.

DORIC INTERCOLUMNIATIONS.

In the Doric Order, since the Columns come exactly under the Triglyphs and the Triglyphs are $1\frac{1}{4}$ D. o. c., as on edges (the width of the Triglyph being $\frac{1}{2}$ D. and that of the Metopes $\frac{3}{4}$ D.), the distance of the Columns on centres must needs be a multiple of $1\frac{1}{4}$ D.

This makes the coupling of Doric Columns difficult, since, even if the Bases touch, the distance between axes is still $1\frac{1}{3}$ D., which is more than that of the Triglyphs by $\frac{1}{12}$ D. This slight discrepancy can, however, be got over by making each Base a trifle narrower, or the Triglyphs and Metopes a trifle wider, or by putting the Columns *not* exactly under the Triglyphs, or by employing all these devices at once.

If the Columns are set under alternate Triglyphs so that there is one Triglyph over the intervening space, their distance apart o. c. is $2\frac{1}{2}$ D. The Intercolumniation is then $1\frac{1}{2}$ D., and is said to be *Monotriglyph*. This is the most common arrangement. But if the scale is small, it is usual, at least at the principal entrance of a building, to have two Triglyphs over the opening, the Columns being $3\frac{3}{4}$ D. on centres. The Intercolumniation is then $2\frac{3}{4}$ D., and is called *Ditriglyph*. Still wider spacing is employed when the Architraves are of wood.

When two, four, six, eight, ten or

[1] Continued from No. 1394, page 85.

twelve Columns are used, in a Colonnade or Portico, it is said to be *Diastyle*, *Tetrastyle*, *Hexastyle*, *Octastyle*, *Decastyle* or *Dodecastyle*, according to the Greek numerals. Examples are found at Argos, Assos, Thoricus and Pæstum of façades with an odd number of columns, three, five, seven and nine, a column instead of an intercolumniation coming on the axis, giving tristyle, pentastyle, heptastyle and enneastyle porticos. But in most of these cases the entrances were on the sides of the buildings, where there was an even number of columns.

SUPERPOSITION.

Superposition is the placing of one Order above another, as in the Roman Amphitheatres and in many modern buildings of several stories. The more solid forms of the Tuscan and Doric are naturally placed below, and the Ionic and Corinthian above. The Composite is sometimes placed below the Corinthian, as being more vigorous. But in high buildings it is generally placed on the top story, its large details being better seen at a distance than are those of the more delicate Order.

Even when the same Order is employed in the different stories it is advisable to have the upper Columns of smaller diameter than those below, and all the dimensions diminished accordingly, for the sake of lightness. But it is still more so when different Orders are superposed, for otherwise the Doric and Corinthian stories would overpower the Tuscan and Ionic ones beneath. It is usual, accordingly, to make the lower diameter of each Shaft equal to the upper diameter of the Shaft below it, as if they were all cut from a single piece of tapering stone. This makes the scale employed in the second story five-sixths of that used in the first; in the third, twenty-five thirty-sixths, or about two-thirds; in the fourth, about three-fifths, and in the fifth, about one-half, if the Five Orders are employed in regular sequence; this makes the relative height of the Orders in the successive stories to be as 7, $6\frac{2}{3}$, $6\frac{1}{4}$, $5\frac{5}{6}$ and 5, very nearly. The actual height of the stories themselves may be somewhat modified by the use of plinths and pedestals.

This system of Superposition makes the distance apart of the Columns in each story, when expressed in terms of their own Diameter, six-fifths of that in the story below. A Eustyle Intercolumniation in one story thus exactly produces a Diastyle Intercolumniation in the story above, and a Doric Monotriglyph Intercolumniation, a Systyle.

$(\frac{6}{5} \times 3\frac{1}{3} = 4;\ \frac{6}{5} \times 2\frac{1}{2} = 3.)$

Coupled Columns set $1\frac{1}{3}$ D. apart, on centres, in one story, are, in the story above, $1\frac{3}{5}$ D. o. c., and in the third story nearly 2 D. o. c. This does very well for a sequence of Doric, Ionic and Corinthian (152). But if the lower Columns are Ionic or Corinthian those above may well be set nearer together, the axis of the Intercolumniation only being preserved (153).

With this exception Superposed Columns are set so that their axes are in the same vertical line, when seen in elevation. But in profile, as seen in section, the upper ones are set back, the wall against which they stand generally growing thinner as it goes up (154). Since the Columns themselves also grow smaller, it would not do to leave too much space behind them. The slightly pyramidal effect which this gives to a building of several stories is of great value, preventing it from looking top-heavy and high-shouldered.

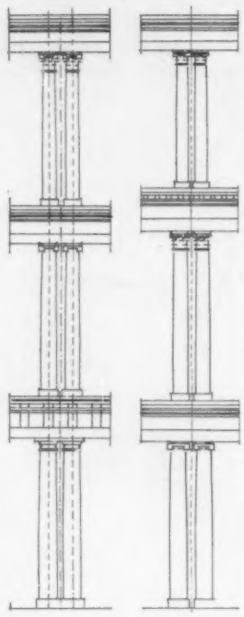

Fig. 152. Fig. 153.

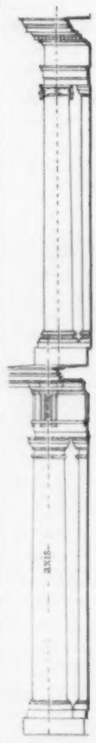

Fig. 154.

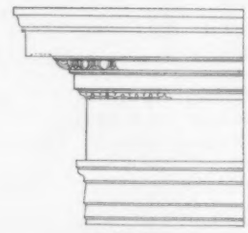

Fig. 155.
From the Pantheon, Rome.

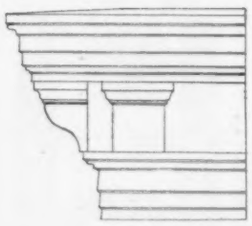

Fig. 156.
From the Fourth Order of the Colosseum.

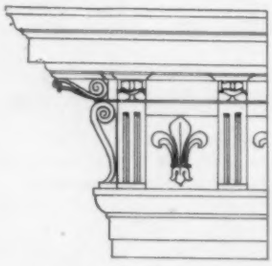

Fig. 157.
From the Villa Caprarola. By Vignola.

OTHER CORNICES AND STRING-COURSES.

The Five Orders worked out by Vignola are generally accepted as a standard, though they are seldom exactly followed in practice, modern as well as ancient examples exhibiting a great variety in the forms and proportions of the parts. But familiarity with them is of great service in designing, since they can safely be employed on all ordinary occasions, and in the earlier stages of architectural composition. Other types of nearly equal merit have been published by Alberti, Palladio, Serlio, Scamozzi, Sir William Chambers, and others, and a great variety of cornices, both with and without friezes and architraves, have been employed in ancient and modern times to crown and protect walls that were not decorated with columns or pilasters.

Many of these show Blocks or Modillions without any Dentil-course below, as on Palladio's Composite Cornice, and in many of them the Dentil-course is plain, forming what is called an *Uncut* Dentil-course (155). In others the brackets which support the Corona are brought down so as to occupy the Frieze (156). The most important

of these is Vignola's so-called *Cantilever Cornice* used by him at Caprarola (157). It seems to have been suggested by the Mutules and Triglyphs of his Mutulary Doric.

Cornices, and indeed full Entablatures, are often used as String-courses to separate stories, as in the Roman Amphitheatres. But it is customary to use, instead, a lighter form, of small projection, somewhat like the cap of a pedestal, in which the Cymatium and Bed-mould are often omitted, and the Corona itself sometimes diminished to a mere fillet (158 to 162).

Fig. 158.

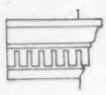

Fig. 159.

From the Farnese Palace. By San Gallo.

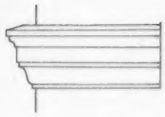

Fig. 160.

String-course from the Strozzi Palace.

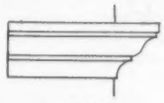

Fig. 161.

String-course from the Palazzo Giraud. By Bramante.

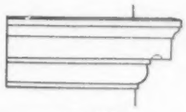

Fig. 162.

String-course from the Sachetti Palace. By San Gallo.

ERRATA.

Vol. LXXIII, No. 1341, September 7, 1901; page 75, right-hand column, twenty-fourth line from the bottom: for "Mutules," read "Metopes." Page 76, right-hand column, lines eighteen, twenty and twenty-one from the top: for "degrees," read, "of a Diameter."

Vol. LXXIV, No. 1352, November 23, 1901; page 60, right-hand column: omit lines fifteen, sixteen, seventeen and eighteen from the bottom.

Vol. LXXVII, No. 1390, August 16, 1902; page 51, left-hand column, ninth line from the bottom: read, "a Regula as broad as the Triglyph." Page 53, left-hand column, eleventh line from the bottom: for "dentils," read "details."

Vol. LXXVII, No. 1394, September 13, 1902. Page 83, right-hand column, at the end of the third paragraph: for "three," read "two." Page 84, right-hand column, fifth line from the top: for "one-fourth," read, "about one-fourth."

Plates of the Doric Order; $\frac{7}{8}$ *D* at the top of the Capital should show the width of the Abacus, not that of the moulding which crowns it. For "$\frac{3}{4}$ *D*" above the Cymatium, read "1 *D*."

Plate of the Composite Order; for the height of the lower band of the Architrave in Palladio's Order, read "$\frac{2}{3}$" instead of "$\frac{1}{3}$."

W. R. WARE.

[The end.]

URALITE.

A DETAILED description of the new fire-resisting material uralite, invented by a Russian artillery-officer named Imschenetzky, is given in an interesting report made to the State Department by Consul-General Hughes, of Coburg. The substance is said to be virtually waterproof, is not affected by atmospheric conditions, and is a non-conductor of heat and electricity. It can be cut like wood with carpenters' tools, painted, grained, and polished, and is available for many purposes of interior construction and decoration. Mr. Hughes says that uralite is an asbestos fibrous substance, composed of asbestos-fibre, silicate, and bicarbonate of soda. It can be prepared hard or soft and used in a variety of ways. The process of manufacture, which is akin to that of paper-making, is given in full.

Mr. Hughes, in discussing the fire-resisting qualities of uralite, quotes an expert who speaks thus regarding some suggestive tests: "Three principal tests were made, and they fully proved that the material possesses the following qualities: (1) It is able to withstand intense heat for a long time without disintegration; (2) its non-conducting powers are uniform throughout; (3) it is capable of entirely preventing the passage of flame from any room where fire occurs; (4) after prolonged exposure to fire, it is able to resist water without serious damage; (5) exposure to changing atmospheric conditions does not effect it; (6) all the materials employed in its manufacture possess substantially the same chemical, physical, and thermal constants. In order to carry out the tests, a small brick-built house, an iron-framed hut, lined and covered with uralite, and a duplicate platform were erected. Each of these was fitted with pyrometers, recording the temperatures electrically, and was filled with highly inflammable materials. In the case of the platforms, the materials were distributed evenly under the two sections. To the test-house were attached four doors. One door was constructed with two oak boards $\frac{3}{4}$ inch thick. Next to the timber was a thin steel armor-plate, and over all was a covering of uralite. The second door, suitable for inside use, was built of two sheets of hard uralite running through the centre of the door and forming panels. The framework consisted of timber laid on either side. A door for warehouse purposes consisted of a thickness of soft uralite in the centre and oak on either side. Next to the timber was fixed a thickness of soft uralite, and the whole was covered by a layer of hard uralite. The stiles of the other door were constructed of oak, $1\frac{1}{2}$ inch thick, and the panels were filled-in with uralite cement. The timber was covered over with soft uralite, and on that a thin steel armor-plate was fixed. The whole was covered by hard uralite. In each case, the materials were fixed together by means of nails and screws.

"A fire was lighted inside the house and the doors were shut. The highest temperature reached was 2,350 degrees Fahr. After the test, it was found that in each case the doors had resisted the fire. It is interesting to note, however, that in the case of the second door practically all the wood outside was burned off, leaving the outer layer of uralite uninjured by the severe heat. The fire was left to burn for over an hour. In the hut was placed a deed-box made of the uralite and wood, and in the box were placed some papers, a book, a crucible containing paraffin-wax, and another holding a piece of easily fusible metal. After being subjected to an external heat of 2,030 degrees Fahr., the papers and book were not affected in the slightest degree. It was found that the wood nearest the fire was charred right through, but the middle layer of uralite was sound and the paraffin-wax had only melted slightly. The platform was 12 feet long and 6 feet wide, was built of wood, and but one-half was covered with uralite. After the fire had burned underneath it, and had reached 2,270 degrees Fahr., the unprotected portion was completely destroyed, but that covered with uralite was whole and strong and several of the visitors walked across it. After the fire in the small house had been going three-quarters of an hour, and when the pyrometer was registering 2,120 degrees Fahr., those present were able to place their hands in contact with any part of the door which was covered inside and out with uralite, though by this time the whole of the woodwork had been burned off the door which had uralite for its panels only.

"I afterwards witnessed some tests showing the crushing and breaking strain of the material. In the first, a cube 1 inch square, built up with sections, cut from standard sheets, was subjected to hydraulic pressure. A pressure of 19.8 tons was registered before they gave way. In the second test, a strip $9\frac{1}{4}$ inches long, $1\frac{1}{2}$ inches broad, and $\frac{7}{64}$ inch thick was placed between supports and gradually subjected to an increasing weight placed at its centre. It did not break till a weight of 6.875 kilogrammes (just over 15 pounds) had been applied."

THE FABRIC FUND OF WESTMINSTER ABBEY.[1]

"AN insolvent Chapter and a ruinous fabric!" In such words, just twenty-one years ago, were his coming responsibilities described to the then newly-appointed Dean, Dr. Bradley, by one whose intimate knowledge of Westminster justified him in making so bold and discouraging an assertion — an assertion, moreover, in which it was only too quickly proved there was little exaggeration. There are probably few who remember, or at the time fully realized, the financial crisis through which the greatest of our national monuments had to pass between fifteen and twenty years ago.

Before the Dean who is now on the eve of his retirement had been a year in office, a report was brought to him by the architect and surveyor of the Abbey (the late Mr. J. L. Pearson) which aroused the gravest anxiety for the condition of the fabric. It was obvious that a very large expenditure was required, and without delay, to prevent the most serious results. How this expenditure was to be met was a matter difficult indeed for the Dean and Chapter to determine.

An Act of Parliament had been passed in 1868, followed by an Order in Council in 1869, by which the landed and other property belonging to the Abbey, much of which in the vicinity of London had increased enormously in value in the early years of Queen Victoria's reign, was finally transferred to the Ecclesiastical Commissioners. In accordance with a commutation or settlement then agreed upon, a certain portion of land and houses was made over to the Dean and Chapter, while another sum of equal amount in money was to be paid to them annually, a further sum of £20,000 being awarded for repairing the fabric. Unfortunately, however, the value of the lands assigned to the Abbey began rapidly to diminish after this settlement, a contingency which could not have been foreseen either by the Commissioners or by the representatives of the Chapter, who appear to

[1] Extracts from a paper by Miss Rose M. Bradley, in the *Nineteenth Century* for September.

have been at this time quite unaware of the real condition of the building, or of the constant and increasing demands which would be made for its repair upon the Abbey funds in the years that were to follow. And so it happened that in 1882 the revenues were scarcely sufficient to supply the reduced annual stipends of the officials. Fabric Fund, as such, there was practically none; and the Commissioners, however willing to readjust the settlement, had no legal power to do so, nor could they without fresh legislation assist the Dean and Chapter by an immediate grant. But neither could the Abbey be permitted to fall. In this dilemma an appeal to the country, and even to America, was suggested, which would no doubt have met with prompt response on both sides of the Atlantic. But the Dean felt strongly that the maintenance of a building of so exceptional a character should not be dependent upon the generosity of individuals, but should form a "matter of serious consideration to the Government and Legislature of the nation." And for six years the matter was very seriously considered, and much correspondence passed between the Dean (representing the Chapter), the Ecclesiastical Commissioners, and Her Majesty's Government. In 1886 an Act was passed authorizing a grant of £10,000 to assist the Dean and Chapter in remedying the "present insecure condition of the Abbey." In 1888 was passed the Westminster Abbey Act, followed by an Order in Council, by which a fresh and more satisfactory settlement was arrived at. The whole estates and property belonging to the Dean and Chapter, with the exception of the Abbey itself and the houses of the officials, were transferred to the Ecclesiastical Commissioners; they on their part to pay over an annual sum to the Dean and Chapter, sufficient for their necessary expenses, and a marginal sum to be set apart yearly as a Fabric Fund. As this latter could not in the existing emergency be sufficient, one of the six canonries was also suspended, and remains so to the present day. And so the work of repairing the Abbey was begun in serious earnest, and has been continued with little intermission for the last fifteen years.

In the light of these comparatively recent events it may be of interest to inquire why so great and national a church, linked by the closest of ties with Sovereign and people alike, should have had from its foundation no steadily accumulating fund set apart for its maintenance and what were the circumstances which led indirectly to so insolvent a condition.

From the completion of the first abbey church of Edward the Confessor in 1065 to the dissolution of the monasteries under Henry VIII in 1540, a period of five centuries, the erection and enlargement of the Abbey was mainly, though not entirely, the work of successive Kings. . . .

And through all these five centuries, which may be considered to form the first part of the history of the Abbey, whilst the building and beautifying of the church and monastery were in perpetual progress, no mention can be found of a Fabric Fund. What need, it may be asked, when the King in his palace close by was ever ready, not only to spend largely himself, but had decreed that the resources of the country must, if necessary, be drained to the uttermost for the enlarging and the embellishment of the burial-place of Sovereigns? What need again, when the Abbot, following the example of his royal master, could invariably obtain money by the easy impropriation of existing religious foundations, alien priories and tithes, as well as by other means alluded to above? Generosity of the hour was surely a pleasanter and more profitable virtue to practise than the dull forethought which would put by for a day when that same pile, now their boast and their glory, would crumble — a day which most certainly neither royal nor monastic builder would live to see. It must be remembered, moreover, that the question of repair and maintenance was less prominent during this period than that of construction. The buildings had not been exposed long enough to decay, nor was there a sufficient amount of coal-smoke in the atmosphere of mediæval London to be deleterious. And, most powerful reason of all, there was no feeling against demolishing the work of former generations in order to replace it with new buildings. Nevertheless, there is evidence that the *maintenance* and *repair* of the Abbey had occasionally been a heavy tax upon the community. . . .

Sovereigns continued for a time to erect tombs for themselves and their predecessors. But with the change of religion the bond between King and Church became necessarily less intimate, and the shrine of the sainted Edward the Confessor held less significance for his successors. . . .

The period of the Civil Wars was naturally a disastrous one for the Abbey; but previously, in 1603, on the accession of James I, we find an item in the Chapter Book which shows that an effort had been made in the right direction: "That provision shall be made of lead, stone, timber, and other necessaries towards the reparation of the Fabrik of the Church yearly, to the value of Forty pounds, layd up in the store house, not to be imployed without the consent of the Deane," and a further item which gives authority for the use of the same to "the Treasurer for the time being, with the consent of Mr. Deane," an order which is observed to the present day. Immediately after the Restoration, large fines having been received for leases, considerable sums were expended both in repairing and refurnishing the church, from which the ornaments had been carried off during the Great Rebellion. . . .

In 1624 we learn that one Christopher Tamworth gave £20 to the repair of Westminster Abbey; but it remained for Dean Dolben, appointed in 1662, to make the first genuine effort to establish a permanent Fabric Fund. He prevailed upon the Chapter to assign henceforth "a Prebend's share" (*i. e.*, one-fifteenth of the total annual income) "to be reserved and employed for the repairs of the Abbey," the roof and vaulting of which were said to be in actual danger. So much importance was very properly attached to this measure of Dean Dolben's, who afterwards became Archbishop of York, that to his long epitaph on his monument at York are added the words "*Cœnobio Westmonaster: Conservato.*" This practice of setting aside one-fifteenth, or a Prebend's share, was adhered to until the estates were handed over to the Ecclesiastical Commissioners in the last century. . . .

Year after year further sums were petitioned for and granted for the repair of the fabric, amounting between 1809 and 1822 to no less than £42,000. Dean Dolben's settlement of the one-fifteenth continued to be set aside, and was aided by the produce of all sales of timber, notably of the scaffoldings used for Coronations — a perquisite of which the Abbey can no longer boast — and of the fees paid for the erection of monuments. In pursuance of an Act of Parliament in 1840 the number of Canons was reduced from twelve to six, and in 1868 Westminster School, by the Public Schools Act, ceased to be a part of the establishment of the Abbey, and no longer demanded the repair of its buildings from the Chapter. Matters did not improve, however, even with the rapidly increasing value of the London property, for while the stipends of the Chapter became disproportionately large, no definite sum was set aside towards the Fabric Fund. With the commutation of 1869 even Dean Dolben's modest allowance ceased to exist. It needed, as we have seen, another Act of Parliament and strenuous efforts on the part of the custodians to establish at all events the foundations of a permanent working Fabric Fund, and to save from ruin the last resting-place of those who through ten centuries have contributed, whether as Sovereign or subject, to the greatness of our Empire. For the present Westminster Abbey is saved; but its history, even as given in these few pages, is full of warnings of the absolute necessity for unceasing watchfulness on the part of those entrusted with the care of buildings exposed through a long series of years to the action of a London atmosphere.

ZIMBABWE RUINS.

THE secret of the ancient ruins of Zimbabwe, with its acropolis, temple and forts, has not yet been laid bare. It is still uncertain to whom we owe these mysterious structures and at what date they were erected. A very good case has been made out for identifying Zimbabwe as the Havilah of the Old Testament, and for supposing that Phœnicians or descendants of Phœnicians had a hand in its erection. One thing is certain: that the buildings are not the work of any of the present natives of South Africa, although they may have been used over and over again by local tribes. Native implements found in the ruins prove this. Perhaps the greatest puzzle is the *raison d'être* of the situation of the ruins. The acropolis is situated on a kopje 250 feet high in a plain surrounded by hills, and affording an extensive view along several valleys. The temple is situated in this plain, and down one of the valleys there is a long chain of forts striking eastward as if making towards the coast. The curious part is that there are in the immediate vicinity none of the ancient gold-workings which abound all over South Rhodesia, and there still exists the unsolved problem of the situation of Zimbabwe.

Perhaps in the near future the truth may be disclosed. The Government of South Rhodesia, says the *Scotsman*, have taken a very important step for the preservation of the ancient ruins. They have appointed Mr. R. N. Hall, who is joint-author with Mr. Neal of "*The Ancient Ruins of Rhodesia*," as temporary curator of Zimbabwe. It is to be his work to clear away all rubbish and vegetation that tends to conceal or to destroy the buildings. Mr. Hall arrived at his station on May 23 and already a great amount of work has been done. The walls enclosing passages which wind round and up the kopje to the enclosures on the top have been laid bare, and passages have been disclosed which were not previously thought of. Two of these passages, 20 and 30 feet long respectively, and between walls 8 feet high, were so concealed with rubbish that the visitors' path crossed right over them. Two large ancient entrances have also been discovered. They had been used by the native Makalangas for graves. Other architectural discoveries are a wall with dentelle pattern, a cement-lined enclosure and three wedge-shaped buttresses. The buttresses are of peculiar interest, being the first discovered in Rhodesia. Naturally, in the rubbish cleared away many "finds" have been made. These include the characteristic soapstone birds, beams and bowls. The birds are decorated in the usual fashion, and the beams and bowls show chevron and cord patterns and sometimes figures of animals. Pottery and iron tools have been discovered, but whether they are of very ancient date it is impossible to say. At any rate, they are not such as used by natives of the present day. Perhaps the most valuable discovery is a gold bangle of wirework, weighing 3½ ounces, and a beaten gold-cap, or ferrule.

Although the acropolis, with its winding walls of granite blocks, its monoliths and chambers, is the most imposing ruin, the most interesting ruin and the one in which more "finds" are likely to be

made is the temple in the plain below. A few months ago the interior of the elliptical temple was one impenetrable jungle of trees, bushes, tall grass and creepers. The monkey-rope tree and the wild vine have committed great depredations, and the last remnant of the herring-bone pattern on the wall was fast disappearing. Mr. Hall's arrival was very timely. With the help of fifteen natives he has cleared away all the undergrowth and stumps, and now for the first time an uninterrupted view of the whole structure can be obtained. The most striking object is the large conical tower about 15 feet high, which is suggestive of the old Phallic worship. This cone has suffered somewhat from the growth of trees, and is now slightly tilted. The architectural discoveries made in the temple are: four ancient drains, a double-curved rounded entrance, three sets of stone steps, and several yards of ancient cement-flooring. The cement-flooring is not original with the building. There has also been made clear a large portion of architecture which is of later date than the original building, but built on the top of an original wall. The "finds" in the temple are similar to those on the acropolis. Altogether twenty-five monoliths have been found. Among the soapstone ornaments is a section of an ancient soapstone bowl believed to be the missing portion of a large bowl lent by Mr. Rhodes to the Cape Town Museum. A collection of curious stones, foreign to the district and of odd natural shapes, was also found.

The work undertaken by Mr. Hall is purely that of clearing away the rubbish and making known the nature of the structures. No excavations are being made, so there is still plenty of scope for discovery. It is impossible to imagine that the Government mean to retain Mr. Hall only temporarily. The excellent work he has done ensures his being entrusted with further research. There are so many old ruins in South Rhodesia that it will take years to investigate the whole of them. Mr. Hall has not been unmindful of visitors, and direction-posts have been erected everywhere either to direct people to particular ruins or to indicate the particular nature of the chambers or enclosures. Zimbabwe is three hours' journey in a Cape cart from Victoria, in the south of South Rhodesia. Victoria is reached by coach now from Gwelo, which in a very short time will be connected with Bulawayo by rail. Doubtless, tourists in making the grand tour of South Africa through Kimberley and Bulawayo to the Victoria Falls will take the opportunity on their return journey to make a deviation to the unique ruins of Zimbabwe. It is to be noted that Victoria and Victoria Falls are not to be confused. They are several hundred miles apart. — *The Architect.*

IRON AND STEEL SLAG.

THE utilization of iron and steel slags is discussed in "*Mineral Resources of the United States*, 1901," now in press, United States Geological Survey, by Edwin C. Eckel, who says that, although the greater portion of the slag annually produced by iron and steel works is not available, a great deal of slag is used in the manufacture of cement and of slag brick, as a fertilizer, and in the form of mineral wool; also, to a less extent in the manufacture of paint-stock, alum and glass, and a considerable quantity is disposed of less profitably as road-material, railroad-ballast and in land reclamation.

The most important of these uses of slag is in the manufacture of structural materials, especially in the manufacture of hydraulic cements. Slag-cement is produced by pulverizing, without calcination, a mixture of granulated basic blast-furnace slag and slaked lime. This product, although really a pozzuolanic cement, is usually marketed as "Portland-cement," in spite of differing from true Portland-cement in manufacture, composition and properties. Six or eight plants are at present engaged in manufacturing slag-cement in the United States, the production for 1901 being 272,689 barrels. As slags cooled slowly are only feebly hydraulic, the slag used in the manufacture of slag-cement must be cooled as suddenly as possible. This is done by bringing the slag, as it issues from the furnace, in contact with a jet of cold water. This granulates the slag, renders it strongly hydraulic, and removes most of the sulphur. True Portland-cements can be made from mixtures of which one element is blast-furnace slag, in which case the slag is ground, intimately mixed with powdered limestone, and the mixture then calcined and reground. Two plants are engaged in the manufacture of Portland-cement from slag and limestone in the United States. In England blast-furnace slag has been somewhat largely employed as an adulterant of Portland-cement.

Slag run into moulds on issuing from the furnace furnishes blocks which have been used for paving, notably in Philadelphia. These slag-blocks are very durable, but objectionable because of their slipperiness, which, in English practice, has been overcome by the form of the mould used.

The manufacture of slag brick can hardly be considered as being more than a specialized phase of the manufacture of slag-cement. On issuing from the brick-machine the bricks are placed on racks to dry, which takes from 6 to 10 days, at the end of which time the bricks are ready for use. Slag bricks are light in color; they weigh less than clay bricks of equal size, require less mortar in laying up, and are equal to clay bricks in crushing strength.

The highly phosphatic slags produced by basic Bessemer converters are valuable fertilizers, and in Germany, especially, large quantities are annually sold under the name of Thomas silicate. These phosphate-slags are more efficient as fertilizers than the mineral phosphates. The slight development of the basic Bessemer-steel industry in the United States necessarily renders the use of these phosphatic slags of less commercial importance than in Europe. During 1901 about 1,000 tons of phosphate-slags produced in the United States were sold as fertilizer. This American material has been tested by the American Agricultural Experiment Station, which reports that slag-phosphate gave a greater total yield than did any other insoluble phosphate. The slags produced in steel-plants using the open-hearth process are less valuable as fertilizers than those produced by basic Bessemer converters, as they contain less phosphoric acid and more silica and lime than the basic Bessemer slags.

Over half the material marketed as "mineral wool" or "silicate cotton" is derived from slag, the remainder being manufactured from natural rocks of several different types. During 1901 about 3,500 tons of mineral-wool were made from slags in the United States. The most important property of slag-wool from a commercial point-of-view is that it is a very poor conductor of heat, which property renders it very valuable for all uses for which a non-conductor is desirable, as steam-pipe coverings, safe-linings, etc.

Slag has been utilized in the manufacture of paint-stock, in the preparation of alum, and, in small quantities, in the manufacture of inferior grades of glass.

About 5,000 tons of slag were sold in 1901 in the United States for use in constructing macadam highways and for railroad-ballast. Sections of roads constructed in New Jersey with slag macadam, under State supervision, have proved entirely satisfactory. Slag has been used in highway-construction to some extent near Buffalo, N. Y.; to a greater extent in Pennsylvania and Alabama, and most extensively in the counties of Baltimore, Howard and Prince George, Maryland, where, under certain conditions, it has been found highly satisfactory road-material. In several States, notably in Alabama, slag is largely used as railroad-ballast. Large quantities of slag are also used for reclaiming land and filling abandoned mine-workings.

BOOKS AND PAPERS

MR. CROWNINSHIELD'S second book of poems[1] is quite equal in interest to the first, and shows, as it seems to us, increased smoothness and delicacy in versification. As before, he has chosen, notwithstanding its difficulties, the sonnet form for most of his work, and uses it with great skill. Perhaps the introductory sonnet, "Cor Pictoris," pleases us most, but all of them fulfil the condition essential to the sonnet, of a complete and interesting thought expressed in almost faultless verse. To one who has mastered the difficulties of the sonnet, ordinary versification is a simple matter, and Mr. Crowninshield's longer poems, some of them by no means simple in form, are models of smoothness. It is, possibly, unfortunate for modern poets that their sympathies are claimed by a multitude of interests, more or less discordant; and Mr. Crowninshield, who finds himself impelled to take poetical consideration of Browning's letters, Renaissance painting, popular actresses and imperialism, besides the usual topics of religion, landscape effect and various forms of affection, is at a certain disadvantage in regard to the unity of impression which he makes upon his readers, in comparison, let us say, with one who devotes himself exclusively to the merits of Laura or of Vittoria Colonna; but he is, at least, the more interesting in consequence.

Not the least of the attractions of the book is the charming set of illustrations. After the "poster" horrors in the way of book-ornamentation with which we have been deluged for so many years, it is truly refreshing to find drawings that really look like something,—figures drawn with some reference to the proportions of the human body, and shaded in imitation of nature, not of Beardsley, and landscapes in which the clouds are quite distinguishable from the trees, and the latter have the actual air of vegetation. To these the author adds a beautiful design for the cover, stamped simply in gold on cloth of a pretty tint, while the lightness of the paper makes the book very pleasant to hold, after the ordinary clay-loaded volume.

ILLUSTRATIONS

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

CIRCULAR GREEK TEMPLE FOR BENJAMIN BARKER, ESQ., TIVERTON, R. I. MR. W. W. BOSWORTH, ARCHITECT, NEW YORK, N. Y.

NOS. 13 AND 15 BEACON ST., BOSTON, MASS. MR. C. H. BLACKALL, ARCHITECT, BOSTON, MASS.

HOUSE FOR ARTHUR W. POPE, ESQ. MR. GEORGE H. INGRAHAM, ARCHITECT, BOSTON, MASS.

[1] "*A Painter's Moods.*" By Frederic Crowninshield. With illustrations by the Author. New York: Dodd, Mead & Co., 1902. Price $2.00.

DINING-ROOM FOR OLIVER W. MINK, ESQ., MANCHESTER-BY-THE-SEA, MASS. MR. C. H. BLACKALL, ARCHITECT, BOSTON, MASS.

SUPERPOSITION AND INTERCOLUMNIATION.

FOR description of this plate see article, "The American Vignola," elsewhere in this issue.

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

A VIEW IN CHARLESTON, S. C.

[Additional illustrations in the International Edition.]

LAWN FRONT: HOUSE OF EDWARD J. BERWIND, ESQ., NEWPORT, R. I. MR. HORACE TRUMBAUER, ARCHITECT, PHILADELPHIA, PA.

HOUSE OF WM. H. OAKES, ESQ., WABAN, MASS. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.

CHOIR DETAILS: ALL SAINTS', GREAT NECK, LONG ISLAND, N. Y. MESSRS. CRAM, GOODHUE & FERGUSON, BOSTON, MASS., AND SILAS MCBEE, ASSOCIATED ARCHITECTS.

DETAILS OF ROOD-SCREEN: ALL SAINTS', GREAT NECK, LONG ISLAND, N. Y. MESSRS. CRAM, GOODHUE & FERGUSON, BOSTON, MASS., AND SILAS MCBEE, ASSOCIATED ARCHITECTS.

DETAILS OF REREDOS: ALL SAINTS', GREAT NECK, LONG ISLAND, N. Y. MESSRS. CRAM, GOODHUE & FERGUSON, BOSTON, MASS., AND SILAS MCBEE, ASSOCIATED ARCHITECTS.

ALTAR AND REREDOS: ALL SAINTS', GREAT NECK, LONG ISLAND, N. Y. MESSRS. CRAM, GOODHUE & FERGUSON, BOSTON, MASS., AND SILAS MCBEE, ASSOCIATED ARCHITECTS.

NOTES AND CLIPPINGS

CHANGES IN THE WHITE HOUSE. — The north door of the White House, through which for a century visitors have passed, will hereafter be the entrance only for the President and his immediate family, domestic and official. Visitors will henceforth enter through the new eastern basement door. Where formerly was the laundry will now be the entrance-hall, and a wide staircase up which the visitor will ascend to the President's room. There will really be four White House entrances under the new order. The politicians and business callers will go to the temporary office-building on the west of the grounds; the diplomats and the like will be received at the south-front basement entrance; family and personal callers at the old front door, while the great crowds for the winter receptions will enter near the Treasury through the new terrace. The *porte cochère* there will accommodate four carriages at a time. There will be entrances also for persons on foot, but all leading to the same dressing and cloak rooms, which will be arranged so that the incoming tide will not interfere with the outgoing one. The only essential partition change of the White House first floor is that by which the state dining-room absorbs the west end of the main corridor, where the stairway used to be. The Red, Blue, and Green Rooms will remain. The East Room is much the same, except that it will be more beautiful. — *New York Times.*

ARBITRATION OF LABOR-DISPUTES IN NEW ZEALAND. — The experience of New Zealand with compulsory arbitration ought to be ascertained with exactness before this country proceeds further in its labor legislation. Mr. Frank Dillingham, our Consul at Auckland, not long ago discussed the question, but in that colorless way which characterizes the consular reports. He related that some manufacturers complained that they could not keep pace with competitors in other countries who had longer hours and cheaper labor. There can be no doubt that New Zealand is the paradise of organized labor and popular reforms. The arbitration-courts are composed of three judges, the chief of whom is appointed by the Governor and the other two by the parties in the controversy. The Court has power to enforce its mandates by all the processes incident to a Court of Record in the United States. It has power to fix minimum wages and to settle all manner of disputes. It is permitted the utmost freedom in the admission of evidence, and in technical cases often appoints a special commissioner to investigate. All industrial unions are registered, or incorporated, in order to have the right to appeal to the Court of Arbitration. Agreements with such industrial unions must be in writing. It seems to be generally conceded that New Zealand possesses such great natural resources that it could stand, for many years at least, almost any system of industrial operation. Whether the present one, with its old-age pensions, Government railroads and granaries, works well, is much disputed. A Congressman who visited there last summer gave as his private opinion that the natural resources of New Zealand received the highest compliment that could be paid to those of any country in the fact that they permitted New Zealand to hold its head up out of the ocean, in the face of the wastefulness and folly which accompanied its industrial system. Of course, the piling up of public debts, which has been going on rapidly, is preparing a problem for the future to settle. On the other hand, Mr. Henry Demarest Lloyd's books have given the American public an opposite impression of New Zealand, and between the two people can take their choice. Those who think that Tammany Hall would run the business enterprises of New York to better advantage than its great merchants, or that the Quay organization in Pennsylvania would run the coal-mines better than Mr. Baer and his associates, will naturally take Mr. Lloyd's view, and believe that his representation of New Zealand conditions is judicious. — *Lincoln in the Boston Transcript.*

GERMAN PUMICE-STONE BRICKS. — According to a recent German report, there is in the Neuwied district along the Rhine, between Coblenz and Andernach, an extensive industry in the manufacture of bricks from volcanic sand and pumice-stone, which are found along the base of the Eifelberg. In working the deposits, the surface soil is stripped off, and the sand is piled up, to be shovelled into the mixing-bed of water and lime close at hand. The pumice comes out of the earth in pieces varying in size from grains to lumps some 4 inches across. It occurs in layers, but is frequently interrupted by small patches of more solid fragments of lava. Before moulding, the pumice is screened, larger pieces being broken to pass through a sieve with half-inch meshes. These screened pieces are then covered with a thin coating of cement, and the brick is moulded. The cement is not mixed with the pumice so as to form solid cement blocks, but by the fragments being coated first. The brick is then obtained by these coatings adhering to one another. In the manufacture of 20,000 bricks about 4½ tons of lime are required. After the mixing process, the substance is poured into iron moulds provided with bottoms of detachable boards, which, after the removal of the moulds, act as driers. When the bricks have been exposed to the air for a very short time they are ready for shipment. No modern machinery is used. A workman makes from 800 to 1,800 bricks a day. — *Exchange.*

RELICS OF THE LISBON EARTHQUAKE. — An interesting discovery has just been made in Lisbon which recalls the great earthquake of 1755. During some building excavations made in the Sé quarter of the city, a portico of great beauty was uncovered. Its entrance, which was closed by massive bronze doors, was thrown open, and a lofty and ornate chapel was found containing several tombs of more or less note. One of them, that of an infant, was opened and found to hold the skeleton of a female child clad in a gorgeous gold-brocade vestment, covered all over with "glories," or representations of the Holy Ghost. The tissue of the garment is still in admirable condition, and bears handling and stretching, but it is feared ere long exposure to the air will destroy the fibres and the colors. The Lisbon Archæological Society has taken possession of the relic. Further investigation proved that the remains are those of a child of Dom Pedro. Other tombs will be searched as the excavation proceeds, and rumors of additional valuable finds are already afloat. — *N. Y. Times.*

A FAMOUS WALNUT LOG. — The *Timber Trades' Journal* for July 12th gives the following translation of the history of a walnut log just received at Liverpool from Italy: "Referring to the log of walnut you have (sic) purchased from my brother, Anthony, last year, he got it from my deceased father, John Baptist, on April 24, 1892. My father got it on February 20, 1863, from Charles Dellanegra, who got it hereditarily from his mother, Ketty Cana, on September 28, 1840. Ketty Cana got it hereditarily from her father on April 6, 1788. The said John Baptist Cana was in possession of it before it was established in the rent-roll of this department, which was in 1768. From an old legend existing in this department it seems the said John Baptist Cana who built up the wine-press in 1747, and taking (took?) the walnut-tree from one of his properties once possessed by Count Louis Salomone in the place called Isola in the territory of this department. It is also said that there were not sufficient oxen in the region to carry the tree, which was yet green, to the place where the house was subsequently placed after having built the press. It was necessary to provide half a cow, with much bread and wine, to compensate the men who helped for the carrying of the famous log, which was considered a rarity in the country of Serrevilla. This is all I have been able to get by searching in the archives of the department and by speaking with the oldest men of the country." The account is accompanied by a lithophoto illustration of the log in question, the dimensions of which are quoted as about 26 feet long and 3 feet to 3 feet 4 inches square. — *Notes and Queries.*

THE DEPTH OF GLACIERS. — For many years efforts have been made to ascertain the exact depth of glaciers by boring, but mechanical and other difficulties have hitherto frustrated the carrying out of this method of inquiry. A few days ago, however, Professors Blumke and Hess, from Bavaria, who are well known for their studies of glaciers, succeeded in boring through the Hinteries glacier, in the Otzthal Alps, at a point where the ice was found to be 153 metres deep. The machine used for boring was driven by hand, and is somewhat similar to that usually employed for experimental boring in mines, but was fitted with special arrangements for washing out fragments of ice from the bore-hole, to prevent their freezing together again. The expenses of the undertaking, which amounted to many thousands of marks, were borne by the German and Austrian Alpine Club. — *London Telegraph.*

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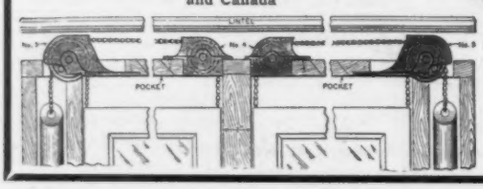

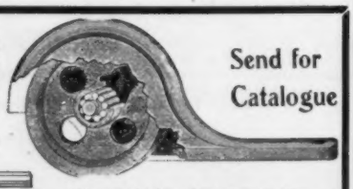

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"The Georgian Period"

This Part, like its immediate predecessor, is devoted to the Colonial Architecture of the Southern States

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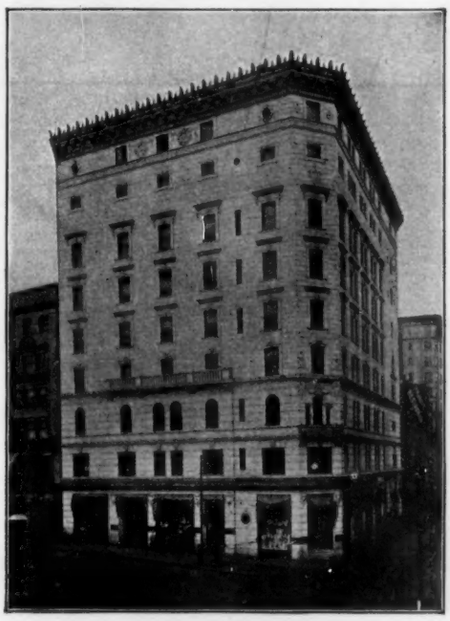

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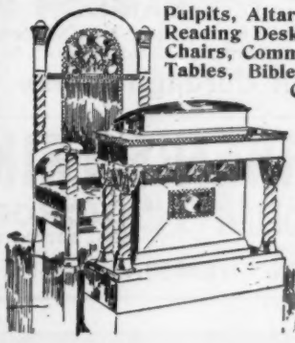

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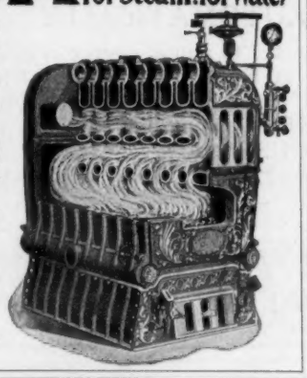

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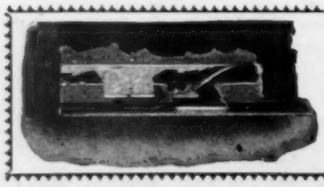

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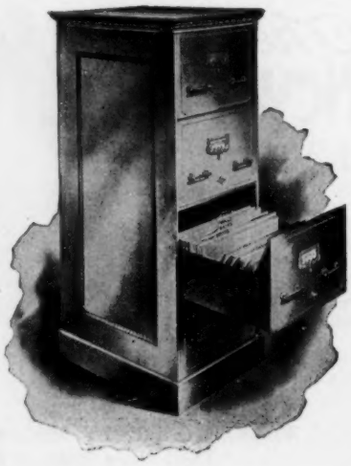

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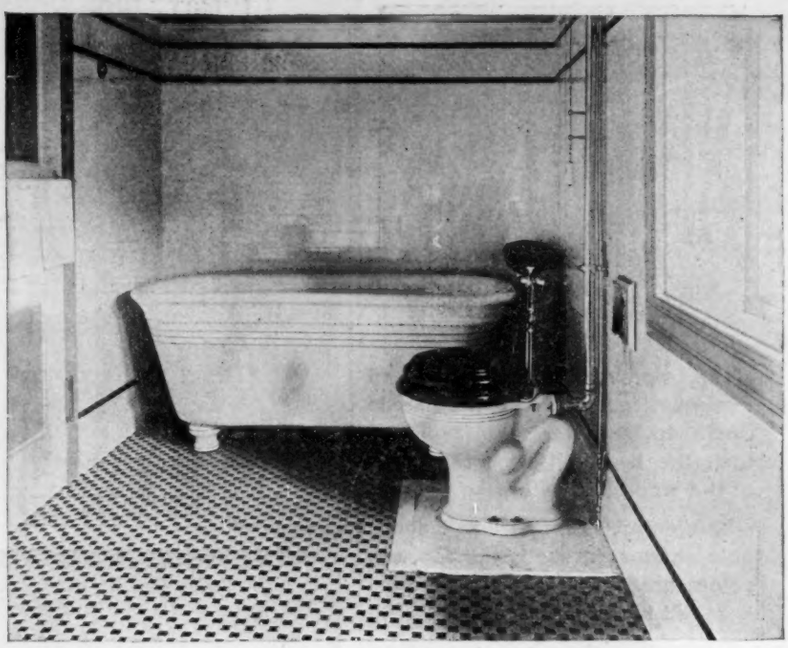

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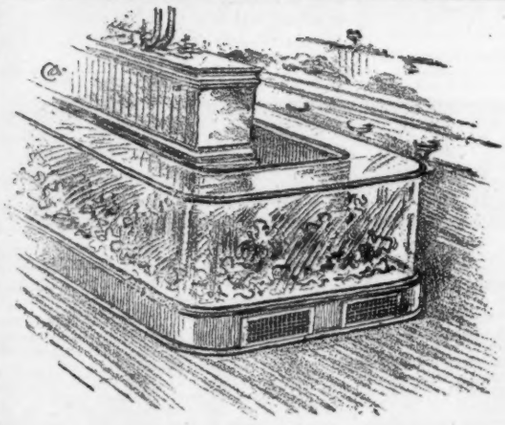

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BUILDING INTELLIGENCE.

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[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

ADVANCE RUMORS.

Allegheny, Pa. — The High School Com. of the Bd. of Controllers has recommended the issue of $125,000 bonds for the erection of an annex to the High School.

Anderson, S. C. — Another large cotton factory is announced for this place. It is projected by R. S. Hill, president of the Farmers & Merchants Bank and several other local enterprises, who has publicly stated that the new mill is assured. The capital stock will be $600,000, and a number of financiers and business men have taken stock in the proposition. The plan is to build for 25,000 spindles and about 750 looms, for the production of high grade cotton goods.

Asheville, N. C. — The Asheville Office-building Co., has been incorporated, with a capital of $100,000, to erect an office-building.

Baltimore, Md. — Plans have been prepared for a $300,000 brick and granite theatre building and hotel, 110′ x 150′, for James L. Kernan to be built on Franklin St. Also for a $100,000 four-story brick variety theatre building, 66′ x 88′, to connect with other buildings, having electric light, cold storage and stained, Cathedral and plate glass. Allen & Co., Philadelphia, Pa., architects.

Beverly, Mass. — The Beverly Realty Co., a syndicate of Beverly and Boston capitalists, have purchased the Gilbt. Weston estate on Cabot St., and are preparing for the erection of a department store thereon. The building will be of brick, with a front of Milford pink granite, will be 100′ x 100′, two stories and basement.

Dr. Charles T. Parker, of New York, has purchased a 20-acre tract adjoining the Peter E. Clark estate and fronting on Standley St. Dr. Parker's holdings now aggregate over 80 acres. He will build one of the finest summer residences in this section.

Boston, Mass. — Plans have been prepared by Architect M. D. Safford, 274 A St., South Boston, for a large frame storehouse, 292′ x 853′, one and two stories high, to be erected on Summer St. extension, South Boston, for the Boston Molasses Co. The cost above the foundations will be $40,000.

Bryn Mawr, Pa. — Cope & Stewardson, 320 Walnut St., Philadelphia, are preparing plans for a country residence for Francis L. Potts, to cost about $70,000. The plans provide for a stone fireproof building, hard wood interiors, open fireplaces, electric-lighting, tile and mosaic work and all other modern conveniences.

Cedar Rapids, Ia. — The board of trustees of the Cedar Rapids public library has chosen the site at 3d Ave. and 5th St. for the $75,000 Carnegie library building.

Chicago, Ill. — Local press reports state that Lincoln Park will be allowed this year $300,000 for the repair of the sea wall.

Howard G. Hodgkins, 240 La Salle St., is at work on plans for a ten-story building which Chas. Pope will erect at 121 to 127 Plymouth Pl. It will be constructed of pressed brick and stone, 100′ x 100′, the interior being fireproof. It will be occupied by publishers, printers, lithographers and electrotypers. It will cost $125,000, and construction will be commenced as soon as possession of the property is obtained.

Shepley, Rutan & Coolidge, Old Colony Building, are at work on plans for the School of Law and Jurisprudence, to be erected in connection with the University of Chicago. The building will be three stories high and will extend over an area of 60′ x 170′. It will be of stone, with tile roof, the interior being fireproof. The cost is estimated at $200,000.

J. C. Llewellyn, 153 La Salle St., is at work on plans for a big warehouse to be erected in this city, to cost $100,000. He is also making sketches for several fine residences.

William Strippleman, 153 La Salle St., is at work on plans for a six-story factory, 62½′ x 100′, which C. C. Heisen will build at 34 to 38 Union Park Ct. The exterior will be of brick and stone and the interior of mill construction. It will cost $30,000. The same architect has designed for the same owner a six-story warehouse, 60′ x 120′, to be erected on Carroll Ave., near Union Park Ct. It will be of brick and stone, the interior being of mill construction, and will cost $40,000.

Shepley, Rutan & Coolidge, 84 Van Buren St., are reported to be preparing plans for the school of law to be erected for the University of Chicago,

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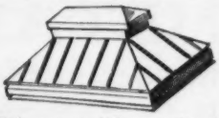

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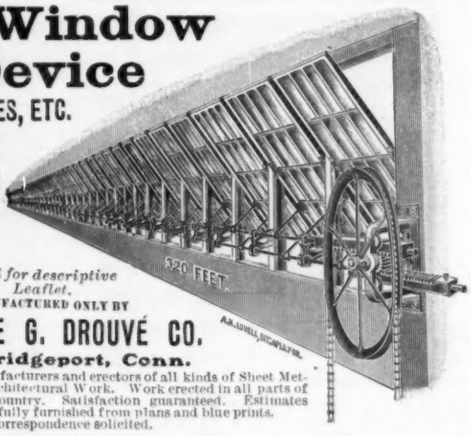

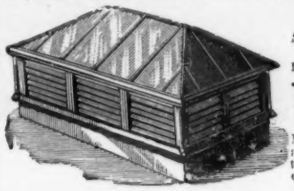

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(Advance Rumors Continued.)

west of Haskell Museum. It will be three stories high, 60′ x 170′, of fireproof construction, with stone exterior, and will cost about $200,000.

Cincinnati, O.—Werner & Adkins, 77 Mitchell Bldg., have drawn plans for a building for the Brighton German Bank to be erected on Harrison and Colerain Aves., to cost $40,000.

Plans for the new Observatory building have been approved by the committee of the board of directors of the University of Cincinnati.

Messrs. Ziegler and Anderson, managers of the Columbia and Walnut St. theatres are contemplating the erection of a $200,000 theatre building.

A corner site has been purchased by the Union Life Central Insurance Co. for $375,000. It is said that a $1,000,000 twelve-story office-building will be erected.

The George Zehler Provision Co. will erect an $8,000 brick and stone stable, 25′ x 112′, having box stalls, asphalt floors, elevators, sanitary plumbing, etc. Emil G. Rueckert, 1620 Linn, architect.

Cleveland, O.—A $125,000 four-story pressed brick and stone store and apartment building, 100′ x 142′, will be erected at Doan St. and Euclid Ave. for Mrs. Louisa Southworth after plans by Charles W. Hopkinson, Rose Building.

Clinton, Mass.—George W. Weeks, a former agent of the Lancaster gingham mills, who died recently, left an estate of about $250,000, of which amount $130,000 is given away in public bequests. The will leaves this town $15,000 for a library site and $5,000 for the purchase of scientific books.

Council Bluffs, Ia.—The Roman Catholic Sisters will build an addition to the St. Francis Academy for Young Ladies next spring, at a cost of $30,000 to $35,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Darien, Conn.—Through contributions pledged by John D. Crimmins and other wealthy New Yorkers who have summer homes here, this town is soon to have a handsome new free public library. Mr. Crimmins has pledged $500 for the library, and has promised a liberal gift in books. Other men have given the site and have pledged sufficient money to insure the erection of an imposing building, costing $5,000 or $6,000.

Fond du Lac, Wis.—The plans of Van Ryn & De Gelleke, Milwaukee, were adopted for the new library building here. Bids are now being taken.

Greenfield, Mass.—The School Com. is considering the question of erecting a high school, at a cost of $60,000.

Hartford, Conn.—Architect George Zunner has drawn the plans for the superstructure of the Sacred Heart Church at the corner of Ely and Winthrop Sts. It will be brick, 50′ x 94′, seat 1,000, and cost $20,000.

Hickman, Ky.—Frank P. Milburn, Columbia, S. C., has drawn plans for a $25,000 court-house, to be erected for Fulton County. Bids will be received in about 60 days.

Kansas City, Mo.—E. C. Nichols is the architect for a $65,000 brick cold-storage plant to be erected for the Kansas City Ice & Cold Storage Co. at 8th and Hickory Sts.

J. C. Llewellyn, 153 La Salle St., Chicago, is about to take figures for a warehouse, to be built for the Advance Thresher Co. It will be five stories and basement, and will extend over 80′ x 126′. It will be constructed of pressed brick and stone and will be unusually substantial. It will cost $50,000.

Keyser, W. Va.—The erection of a 25-stall roundhouse and general machine shops is contemplated by the Baltimore & Ohio Railroad Co., at a cost of $450,000.

Kittanning, Pa.—It is stated that plans are being prepared for a $40,000 theatre to be erected on McKain St. James McCullough, Jr., is reported interested.

Lima, O.—The Lima Lodge of Elks has purchased the Moore residence on W. Market St. and has adopted plans for the complete remodelling of the residence into handsome club and lodge rooms.

Marietta, O.—St. Mary's congregation will erect a new stone edifice to cost $50,000. Plans by Fugman & Uhlrich, Williamson Building, Cleveland.

McKeesport, Pa.—A four-story addition is to be made to the National Hotel. It is to be 56′ x 101′, of brick and stone. Plans were drawn by E. J. Carlisle & Co., Westinghouse Building, Pittsburgh. Cost, $20,000.

Memphis, Tenn.—The Nashville, Chattanooga & St. Louis Railroad Co. will erect a freight depot at a cost of $20,000.

Menasha, Wis.—A $25,000 brick and stone hotel building will be erected here. Geo. H. Utz, cashier, First National Bank, interested.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Middletown, Conn.—It is stated that an astronomical observatory is to be erected at the Wesleyan University, to cost about $40,000.

Milwaukee, Wis.—The congregation of the Summerfield Methodist Episcopal Church is considering the erection of a new edifice at an approximate cost of $75,000.

Muskegon, Mich.—Charles H. Hackley has given $75,000 for the erection of the Hackley Memorial Hospital building. Plans have been prepared.

Norfolk, Va.—It is stated that Arthur G. Glasgow, of London, Eng., has employed John K. Peebles to prepare plans for a $50,000 office-building to be erected here.

Northampton, Mass.—Plans prepared by Architect M. H. Hubbard, of Utica, N. Y., have been accepted for a brick church to be erected here for the Baptist Society. Will seat 500, and cost $25,000.

Pittsburgh, Pa.—Local press reports state that Sidney F. Heckert, 341 Sixth Ave., has completed plans for an apartment-house to be erected by a syndicate at Bellefield, to cost about $600,000.

The members of the South Side branch of the Young Men's Christian Association contemplate the erection of a $50,000 building at 22d and Carson Sts.

Plans for a $300,000 stone residence, to be erected for F. T. F. Lovejoy, Frick Building, are being prepared by Alden & Harlow, Dallmeyer Building. Tile roof, steam heat.

Pointe a la Hache, La.—The citizens are reported to have voted to authorize the Bd. of Comrs. for the Back Levee Dist. to issue $135,000 bonds for building a levee.

Providence, R. I.—One of the most important of the new buildings, which will soon begin to rise on the Brown University campus, has taken another step toward materialization. The proposed John Carter Brown Library building is to be built by the firm of Norcross Brothers, the contract being awarded recently. The structure is to be of Indiana limestone, 80 feet square. It will front on George St., 12 feet back from the sidewalk and 30 feet from Wilson Hall. On both the east and west sides of the building the corporation has reserved a space of 50 feet. The foundations will be laid this fall and the walls next spring.

Richmond, Va.—M. J. Dimmock, State Bank Building, is preparing plans for a $50,000 hotel, to be built by John Tyler.

The Richmond Realty Development Co., Leon L. Strauss, pres., and J. D. Lecky, sec'y and treas., will erect 9 stores on Main St. and 4 residences on 5th St., to cost in all $100,000. Carl Ruehrmund, 918 E. Main St., architect. L. C. Jenkins, contractor.

A press report states that Thos. F. Ryan, partner in the railroad syndicate composed of such millionaires as William C. Whitney, P. A. B. Widener and W. L. Elkins, has given to this city a new cathedral, which will be erected at a cost of $250,000. The designs for the cathedral were drawn by Joseph H.

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BUILDING INTELLIGENCE.

(*Advance Rumors Continued.*)

McGuire, a well-known architect of this city. The estimates are in, and the contracts for the erection will be awarded in a few days. The cathedral will be built in the Italian Renaissance style, and will front on Monroe Park. It will be of limestone and light-colored brick, with a green Spanish tile roof. The building will have a seating capacity of 1,200.

San Luis Obispo, Cal.—W. S. Hunt, of Minneapolis, has drawn plans for a hotel to be erected here by A. M. Smith. It will be 50′ x 100′, two stories, of native redwood, cedar shingles, modern interior fixtures and finish.

Shirley, Mass.—Plans are being drawn by Architects H. M. Francis & Son, 387 Main St., Fitchburg, for a three-story brick block, 50′ x 65′, to be erected here for T. L. Hazen, postmaster. The building will contain post-office, two stores, lodge-rooms and offices. It is probable that only the foundation will be put in this fall.

South McAlester, Ind. Ter.—The Missouri, Kansas & Texas Ry. Co. is to erect a $40,000 brick depot here. S. B. Fisher, Ch. Eng., St. Louis, Mo.

St. Louis, Mo.—Plans for a $500,000 hotel have been drawn by Eames & Young, Lincoln Trust Building. It is to be erected at 12th and Olive Sts.

The Kansas commissioners to the St. Louis Exposition met recently at Topeka and employed H. M. Hadley, a Topeka architect, to formulate regulations for a competition on plans for the Kansas building at the Fair. The winner will be made supervising architect and in addition will receive a prize of $500. The building will be about 80 feet square, and, including porches, will cover about 7,000 square feet of space. There will be a reception-room for women, a smoking-room for men, a baby nursery, an art-room and a general exhibit room for the famous Dyche collection.

The design of R. Bruce Watson, 303 Dearborn St., Chicago, has been accepted for the $50,000 Illinois Building at the St. Louis Exposition.

The sum of $75,000 has been donated to the union station railroad branch of the Young Men's Christian Association for the erection of a new building.

Stockton, Cal.—Plans for a $100,000 high-school building have been adopted and bids advertised for. It will be heated and ventilated by a modern fan and steam system.

St. Paul, Minn.—J. Walter Stevens has made plans for a church to be erected on Nelson and Farrington Aves. for the First Christian Society. It will be 56′ x 56′, of pressed brick and cut stone, seating 400, hot-air heating. Cost, $15,000. The contract for the foundation will be let soon.

Sullivan, Ill.—The Illinois Grand Lodge has appropriated $25,000 for the construction of a home for widows and orphans of Masons, to be located near this place, J. R. Miller having deeded 200 acres of land for that purpose.

Taunton, Mass.—Plans are being drawn by Architect Karl H. Hyde, 9 Horton Block, Attleboro, for a casino to be erected at Talsquega Park for the Bristol County Electric Ry. Will be frame, two stories, 100′ x 120′, to contain café, waiting-rooms, etc., on the first floor, and casino, dancing pavilion, etc., on the second floor, and cost $20,000. The building is to be completed before next season. C. S. Cummings, treasurer, 43 Milk St., Boston.

Versailles, Ky.—John Rump & Son have secured the contract for erecting the school and dormitory for Ashland Seminary, for $25,000.

Washington, D. C.—Leon E. Dessez, 1421 F St. N. W., has prepared plans for a four-story brick and stone apartment-house to be erected on I and 12th Sts., to cost $35,000.

Acting on the recommendation of General Gillespie, Ch. of Engrs., Secretary Root has approved plans for the improvement of the military reservation known as Washington Barracks. Improvements involve an expenditure of $1,260,000, of which amount $900,000 has been appropriated and is immediately available.

Winchester, Mass.—Rev. John W. Suter, rector of the Protestant Episcopal Parish of the Epiphany, has commissioned Architects Cram, Goodhue & Ferguson, 53 State St., Boston, to prepare plans for a church to cost $50,000.

ALTERATIONS AND ADDITIONS.

Boston, Mass.—*Massachusetts Ave., Nos.* 142-148, six-st'y bk. & steel addition to apartment hotel, comp. roof, steam; $300,000; o., Metropolitan Associates; a., Clinton Warren, Winthrop Building.

CHURCHES.

New York, N. Y.—*Broadway*, cor. 56th St., nine-st'y bk. & st. church, 66′ x 178′, copper & tile roof; $350,000; o., Broadway Tabernacle Church, 119 W. 40th St.; a., Barney & Chapman, 44 W. 34th St.

EDUCATIONAL

Boston, Mass.—*Columbia Road*, nr. Edward Everett Sq., Dorchester, three-st'y bk. & st. school, 110′ x 168′, slate roof, hot water; $156,000; o., City; a., Jas. Mulcahy; b., Morrill & Whiton Construction Co., 35 Federal St.

FACTORIES.

Lynn, Mass.—*Washington St.*, cor. Farrar St., eight-st'y bk. shoe-factory, 43′ x 145′, tar & gravel roof;

BUILDING INTELLIGENCE.

(*Factories Continued.*)

o., Lynn Realty Co., Union St.; a., H. W. Rogers, *Item* Building.

New York, N. Y.—*Cannon St., No.* 8, seven-st'y bk. factory, 25′ x 95′; $20,000; o., Jacob Cohen, 58 W. 119th St; a., G. F. Pelham, 503 Fifth Ave.

Lispenard St., Nos. 23-25, seven-st'y bk. loft building with store, 50′ x 90′; $75,000; o. & a., W. G. Piqueron, 29 W. 42d St.

HOSPITALS.

New York, N. Y.—*Boulevard Lafayette and One Hundred and Sixty-fifth St.*, 3½-st'y bk. hospital, 34′ 8″ x 154′ 8″; $100,000; o., Deaf and Dumb Asylum, on premises; a., H. Fouchaux, Broadway & 162d St.

HOUSES.

Boston, Mass.—*Wainwright St.*, nr. Welles Ave., Dorchester, two-st'y fr. dwell., 28′ x 47′, shingle roof, furnace; $5,000; o., Anna M. Chisholm, 83 Clark St.; a., C. A. Russell; b., Hugh Chisholm, 83 Clark St.

Brookline, Mass.—*Kent St.*, 2½-st'y fr. dwell., 26′ x 43′; $8,000; o., A. R. Jones; a., T. M. James, 27 School St.

Brooklyn, N. Y.—*E. Thirteenth St.*, nr. Avenue D, two-st'y & attic fr. dwell., 28′ 6″ x 42′, shingle roof, hot water; $8,500; o., Marion L. Quackenbush, 426 E. 14th St.; a., F. Buchar, 1344 St. Mark's Ave.

E. Fifteenth St., nr. Avenue C, two-st'y & attic fr. dwell., 25′ 2″ x 40′ 9″, shingle roof; $5,800; o., T. B. Ackerson Construction Co., 365 E. 15th St.; a., A. W. Pierce, 1127 Flatbush Ave.

McDougal St., nr. Stone Ave., 5 three-st'y bk. dwells., 20′ x 45′; $30,000; o., E. Brooks, 130 W. 130th St., N. Y.; a., H. Vollweiler, 483 Hart St.

Nautilus Ave., nr. Sea Gate, two-st'y & attic fr. dwell., 25′ 6″ x 42′ 9″, shingle roof; $4,500; o., J. W. Tumbridge, Clark & Henry Sts.; a., C. Schubert, 1832 Bath Ave.

Union St., nr. Brooklyn Ave., 4 two-st'y & attic bk. dwells., 16′ x 40′ & 20′ x 40′, steam; $32,000; o., Eastern Parkway Co., 257 Broadway, N. Y.; a., H. M. Congdon & Son, 18 Broadway, N. Y.; b., H. B. Moore, 86 St. Mark's Ave.

Winthrop St., nr. Flatbush Ave., 6 two-st'y & attic fr. dwells., 22′ x 41′, shingle roofs; $24,000; o., T. H. Radcliffe, 793 Flatbush Ave.; a., A. D. Isham, 220 Broadway, N. Y.

E. Twenty-first St., nr. Avenue P, two-st'y & attic fr. dwell., 30′ 6″ x 30′ 6″, shingle roof; $4,500; o., A. J. S. Sprague, 549 Thirty-seventh St., Chicago, Ill.; a., I. B. Ellis, 154 Montague St.

Fifth Ave., nr. 56th St., three-st'y bk. dwell., 20′ 4″ x 55′; $4,250; o., J. Carlson, 435 Fifty-fourth St.;

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(*Houses Continued.*)

a., G. F. Roosen, 189 Montague St.; b., E. Nelson, 368 Seventy-fourth St.

E. Fourteenth St., nr. Albemarle Road, two-st'y & attic fr. dwell., 36′ x 50′, shingle roof, steam; $14,000; o., Mary D. Ellison, 63 Lefferts Pl.; a., J. E. Mitchell, 28 Ormond Pl.

Atlantic Ave., nr. Beach 42d St., two-st'y & attic fr. dwell., 31′ x 40′; $6,000; o., C. F. Harms, 812 Garfield Pl.; a., F. S. Cornell, 125 E. 23d St.

E. Ninth St., nr. Avenue S, one-st'y & attic fr. dwell., 20′ x 40′, shingle roof; $5,500; o., A. M. Jenks, 21 Park Row, N. Y.; a., A. Murray Jenks, 42 S. 4th St., Mt. Vernon.

Grand St., nr. Union Ave., three-st'y bk. store & dwell., 25′ x 65′, steam; $12,000; o., A. Schmidt, 538 Grand St.; a., Th. Engelhardt, 905 Broadway.

E. Seventeenth St., nr. Avenue D, two-st'y & attic fr. dwell., 38′ 6″ x 38′, shingle roof, steam; $9,500; o., W. F. Steinmetz, 850 Flatbush Ave.; a., C. Gastmeyer, 850 Flatbush Ave.

E. Seventeenth St., nr. Dorchester Road, two-st'y & attic fr. dwell., 37′ x 45′ 4″, shingle roof; $8,000; o., W. D. Ainslie, Plaza St. & Vanderbilt Ave.; a., B. Driesler, 13 Willoughby Ave.

Faribault, Minn.—Two-st'y & base. bk. & st. dwell., 44′ x 100′, gravel roof, steam; $25,000; o., W. W. Cosgrove; a., A. F. Gauger.

New York, N. Y.—*Seventy-fifth St.*, nr. Madison Ave., five-st'y st. front dwell., 25′ x 67′ 5″; $50,000; o., Lenox Hill Corporation, 659 Fifth Ave.; a., Pickering & Walker, 1133 Broadway.

Ninety-fourth St., nr. West End Ave., three-st'y bk. stable & dwell., 25′ x 58′, plastic slate roof; $20,000; o., Central Building and Improvement Co., 440 Washington St.; a., Henri Fouchaux, 162d St. & Broadway.

Terrace View Ave., nr. Kingsbridge Ave., two-st'y & base. bk. dwell., 25′ x 40′; $6,750; o., Ruben C. Harvey, on premises; a., George W. Yeandle, Davidson Ave., Fordham Heights.

Jackson Ave., nr. 166th St., 5 three-st'y bk. dwells., 20′ x 51′ 6″; $37,500; o., C. A. Lavelle, 1120 Jackson Ave.; a., J. H. Lavelle, 1120 Jackson Ave.

Morris Ave., nr. Belmont Ave., two-st'y & base. fr. dwell., 22′ x 54′; $4,500; o., Mrs. Fred'k McConnell, 1607 Morris Ave.; a., W C. Dickerson, 3d Ave. & 149th St.

Ninety-fourth St., nr. West End Ave., three-st'y bk. dwell. with stable, 25′ x 58′; $20,000; o., Central Building and Improvement Investment Co., 136 W. 72d St.; a., H. Fouchaux.

Roxbury, Mass.—*Humboldt Ave.*, nr. Seaver St., two-st'y fr. dwell., 27′ x 53′, shingle roof, furnace; $8,000; o., Kalvin Burgoyne; b., J. Burgoyne, on premises.

St. Paul, Minn.—*Summit Ave. and Albert St.*, two-st'y bk. & fr. dwell., 38′ x 52′; $10,000; o., W. A. Pease; a., C. R. Aldrich.

MERCANTILE BUILDINGS.

Chicago, Ill.—*Quincy St.*, cor. Clinton St., eight-st'y bk. & st. business building, 82′ x 106′, steam; $80,000; o., C. B. Scoville; a., Joseph Downey, 132 La Salle St.

OFFICE-BUILDINGS.

Brooklyn, N. Y.—*Fulton St.*, cor. Red Hook Lane, six-st'y bk. bank & offices, 31′ 8″ x 66′ 6″, steam; $60,000; o., D. Michel, 44 Court St.; a., Helmle, Huberty & Hudswell, Broadway & S. 8th St.

New York, N. Y.—*Twenty-first St.*, nr. 4th Ave., nine st'y bk. & st. lofts, stores & offices, 25′ x 90′, tile roof; $50,000; o., Simon Haberman, 130 W. 116th St.; a., G. A. Schellenger, 130 Fulton St.

STABLES.

Boston, Mass.—*Gibson St.*, off Dorchester Ave., three-st'y bk. stable, 79′ x 80′, comp. roof; $20,000; o., J. H. Townsend; b., A. S. Drisko, 166 Devonshire St.

BUILDING INTELLIGENCE.

(*Stables Continued.*)

New York, N. Y.—*Evelyn Pl.*, nr. Mayflower St., one-st'y fr. barn, 14′ x 19′; $75; o., Mary L. Steiger, on premises; a., Louis P. Steiger, on premises.

One Hundred and Ninety-seventh St., nr. Bainbridge Ave., two-st'y fr. stable, 17′ x 25′, shingle roof; $1,000; o., Harry C. Adams, on premises; a., W. C. Dickerson, 3d Ave. & 149th St.

One Hundred and Ninth St., nr. Amsterdam Ave., six-st'y bk. stable, 50′ x 95′, comp. roof, steam; $35,000; o., M. A. Hoffman, 429 E. 85th St.; a., S. B. Ogden, 954 Lexington Ave.

Decatur Ave., nr. Gunhill Road, one-st'y fr. barn & stable, 41′ x 50′; $2,500; o., William Seitz, Jr., 417 E. 90th St.; a., Moore & Landsiedel, 148th St. & 3d Ave.

W. One Hundred and Thirty-fourth St., No. 107, two-st'y bk. auto stable, 25′ x 97′; $7,800; o., Henry Ungrich, Jr., 60 W. 129th St.; a., M. Louis Ungrich, 473 W. 44th St.

E. One Hundred and Eighth St., Nos. 422-426, one & two-st'y bk. stable, shop & dwell., 25′ x 26′ 8″ & 99′, tin & gravel roof; $1,500; o., Henry Bunker, 205 E. 114th St.; a., Geo. H. Griebel, 489 Fifth Ave.

STORES.

New York, N. Y.—*Lispenard St., Nos.* 23-25, seven-st'y bk. loft & store building, 50′ x 90′; $75,000; o. & a., W. G. Pigueron, 29 W. 42d St.

One Hundred and Thirty-second St., nr. Eagle Ave., two-st'y bk. loft & store, 19′ 5″ x 25′, slag roof; $5,000; o., Constine Wagner, 213 E. 19th St.; a., Wm. H. Birkmire, 396 Broadway; b., George Hollerith, 424 E. 118th St.

PROPOSALS.

STORM WATER SEWERS. [At Westfield, Mass.]

Sealed proposals for building Section 2 of a system of storm water sewers in Westfield, Mass., will be received by the Committee on Surface Sewerage, at the office of the Town Clerk, Westfield, Mass., **until November 5, 1902.** Plans can be seen and blank forms of proposals obtained at the office of the Town Engineer. JAMES H. CLARK, Chairman of Committee. Oren E. Parks, engineer. 1400

COMPLETION OF MESS HALL. [At West Point, N. Y.]

West Point, N. Y. Sealed proposals will be received here **until November 1, 1902,** for completion of the cadet mess hall as per plans in this office. Forms and specifications furnished upon application. Address Q. M., U. S. M. A. 1400

SCHOOL. [At Cleveland, O.]

Bids are wanted **November 3** for erecting Woodridge School; bids will also be received for heating and ventilating and concrete fireproof construction. STARR CADWALLADER, School Dir. 1400

HEATING. [At Fort Monroe, Va.]

Bids are wanted **November 7** for heating by steam, Quarters No. 50. C. P. TOWNSLEY, Q. M. 1400

BUILDING. [At Annapolis, Md.]

Bids will be received **until November 5** at the Bureau of Navigation, Navy Department, Washington, D. C., for the construction of an officers' mess building at Annapolis. Earnest Flagg, 35 Wall St., architect. H. C. TAYLOR, chief of bureau. 1400

LIBRARY. [At Racine, Wis.]

Bids will be received by the library board **until November 1** for the erection of the new $50,000 Carnegie library building. 1400

PROPOSALS.

ELECTRIC LIGHTING. [At Baton Rouge, La.]

Sealed proposals will be received **until November 1, 1902,** for the furnishing of 100 arc-lamps to light the City of Baton Rouge for a period of one to ten years. Specifications can be obtained by addressing Edward Wax, Secretary Water Works and Lighting Committee, Baton Rouge, La. J. B. HARE, Chief of Police. 1400

SCHOOL-HOUSE. [At Trenton, N. J.]

Bids will be received **October 31** by the Com. on Grounds and Buildings for mason and carpenter work, heating and plumbing, separately, or for the whole or any part of work, of a brick and stone school on Fillmore St. J. C. BLOOM, chmn. com. Architect, S. A. Brouse, First National Bank Building. 1400

BUILDING. [At Fort Ethan Allen, Vt.]

Fort Ethan Allen, Vt. Sealed proposals for constructing 1 single barrack, 1 stable, 1 gun shed, will be received here **until November 10, 1902.** Information furnished on application. LIEUT. GEORGE GARITY, Q. M. 1401

ADMINISTRATION BUILDING. [At Fort Banks, Winthrop, Mass.]

Proposals for constructing plumbing and electric wiring an administration building at Fort Banks, Winthrop, will be received **until November 10.** Information furnished on application. 1401

PAVING. [At Portsmouth, Va.]

Sealed proposals will be received at the office of the City Clerk, addressed to C. W. Walker, Chairman of Street Committee, **until December 22, 1902,** for paving certain streets of the City of Portsmouth, Va., with sheet asphalt, asphalt block, vitrified brick, granite block and bituminous macadam, to be done according to specifications furnished upon application at the office of the city engineer. The work contemplated comprises about 45,000 square yards of paving. C. W. WALKER, chairman street committee. Bascom Sykes, city engineer. 1401

Treasury Department, Office of the Supervising Architect, Washington, D. C., October 16, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 20th day of November, 1902, and then opened, for the construction of the U. S. Post-office at Rome, New York, in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Postmaster at Rome, New York, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1401

Treasury Department, Office of the Supervising Architect, Washington, D. C., October 21, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 29th day of November, 1902, and then opened, for furnishing the steam heating and ventilating apparatus, complete in place for the U. S. Public Building at Boise, Idaho, in accordance with drawings and specifications, copies of which may be had at this office or at the office of the Superintendent at Boise, Idaho, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1401

Treasury Department, Office of the Supervising Architect, Washington, D. C., October 21, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 25th day of November, 1902, and then opened for the installation of a conduit and electric wiring system for the U. S. Public Building at Boise,

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POST-OFFICE BUILDING. [At Rome, N. Y.]

Bids are wanted **November 20** for erecting the U. S. Post-office Building at Rome. Jas. Knox Taylor, Superv. Archt., Treas. Dept., Washington, D. C. 1402

JAIL AND RESIDENCE. [At Marion, Ind.]

The board of commissioners will receive bids **until November 25**, for the construction of the $125,000 jail building and a jailer's residence to be built by Grant County. Richards, McCarty & Bulford, "The Ruggery," Columbus, O., architects. 1402

Treasury Department, Office of the Supervising Architect, Washington, D. C., October 14, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 17th day of November, 1902, and then opened, for the construction of a shed over driveway at mailing entrance of the U. S. Post-office at Buffalo, New York, in accordance with drawings and specifications, copies of which may be had at this office or the office of the Custodian at Buffalo, New York, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1400

HOSPITAL. [At Fort Greble, R. I.]

Office Constructing Quartermaster, 209 Thames St., Newport, R. I. Sealed proposals will be received here **until November 8, 1902**, for constructing, plumbing, electric wiring and installing hot-water heating system in 12-bed brick hospital, Fort Greble, R. I. Information furnished on application. CAPT. THOMAS H. SLAVENS, Q. M. 1400

BOILERS. [At Flandreau School, S. D.]

Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals addressed to the commissioner of Indian Affairs, Washington, D. C., will be received at the Indian office **until November 4, 1902**, for furnishing the necessary materials and labor required to install and set up complete, ready for operation, two boilers, for heating purposes in the hospital and school building at Flandreau School, S. D., in strict accordance with plans, specifications and instructions to bidders. For further information apply to Chas. F. Pierce, superintendent, Indian School, Flandreau, S. D. W. A. JONES, commissioner. 1400

QUAY WALL. [At Mare Island, Cal.]

Sealed proposals endorsed "Proposals for Quay Wall" will be received at the Bureau of Yards and Docks, Navy Department, Washington, **until November 1**, for constructing a pile and concrete quay wall at the navy yard, Mare Island, Cal. Appropriation available, $48,500. Plans and specifications can be seen at the bureau or will be furnished by the commandant of the navy yard named. MORDECAI T. ENDICOTT, chief of bureau. 1400

ROOFING. [At Chicago, Ill.]

Bids are wanted **November 6** for furnishing and delivering a large quantity of galvanized iron roofing, etc. Address COL. E. B. ATWOOD, Ch. Q. M. 1400

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

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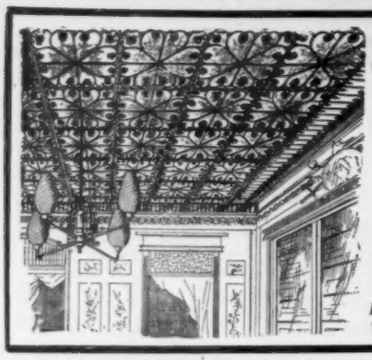

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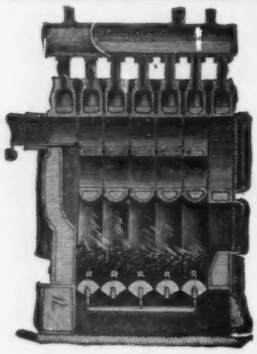

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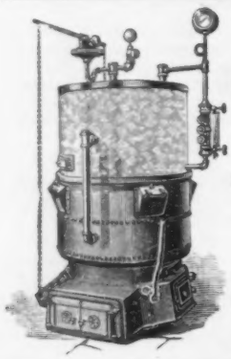

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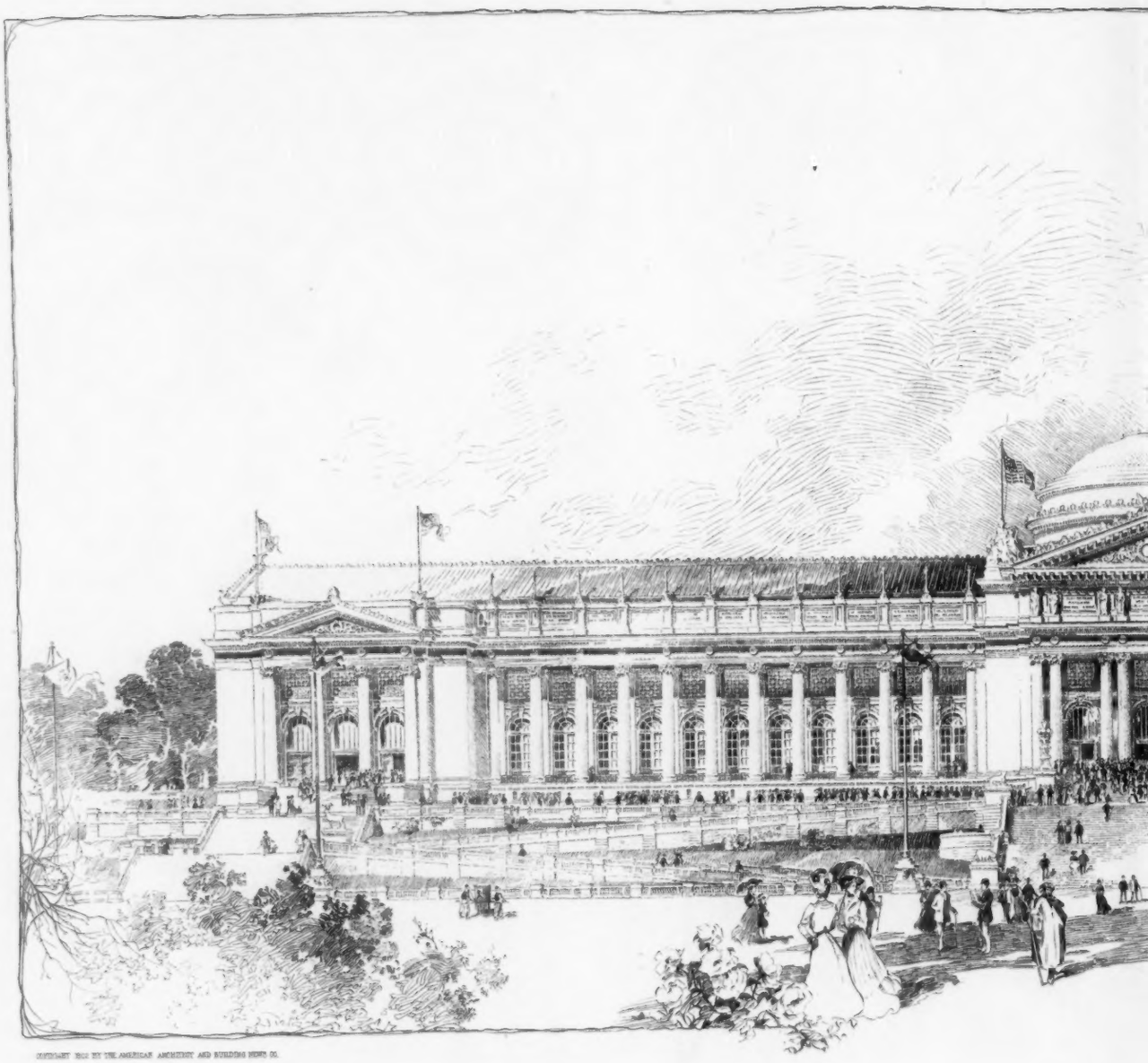

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