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NO. 1020.

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THE late James Renwick, who was a rich man for an architect, left to the Metropolitan Museum of Art a collection of pictures which he had been many years in forming, and which is said to contain some good examples of Italian masters of the first rank of the cinque-cento period, besides a number of pictures by painters of the same school but of the second rank, such as Bronzino, Carlo Dolce, and others less known. Under his will, his pictures are to be kept together, in a room by themselves, and designated by name as the Renwick Collection, in the same way that the Wolfe Collection of modern French pictures is shown. As might be expected in the case of such a gift, a good deal of discussion has been raised as to the genuineness of the pictures in the collection. Pictures by Murillo, Rubens, Guido, Titian, Paul Veronese, Correggio and Velasquez are not to be had for the asking, particularly in New York, and the greater part of those sold there as genuine are undoubtedly copies, or mere impudent fabrications. Moreover, some of the more malicious critics say that Mr. Renwick had very little knowledge of pictures, and that the dealers in London, Boston and New York found him an easy victim to their representations as to the wares which they palmed off on him at extravagant prices.

MALICIOUS gossip of this sort is so likely to find credence, especially in this country, where very few people have ever seen a real old master, and have nothing but their imagination, or their prejudices, on which to base an opinion of the collection, that it is only fair, in the interest of the thousands who may later, if they study it without preconceived notions, derive much instruction from the Renwick room at the Metropolitan Museum, to give some warning against it. It is probable that a part of the sarcasms which are levelled by newspaper reporters at the collection derive their origin from the fact that very few people were allowed to see it in the later years of Mr. Renwick's life, and people are disposed to sneer at what they are not allowed to look at; but this was not always so. A considerable part of the collection originally belonged to Mr. William H. Aspinwall, whose eldest daughter married Mr. Renwick. During Mr. Aspinwall's life, his pictures were shown with the utmost courtesy to any one who came properly introduced, and most New Yorkers of middle age, who care for such things, have probably seen them. In this collection, as it existed twenty-five years ago, were some very beautiful pictures. Whether they were all genuine examples of the great masters whose names they bore we will not pretend to say, but that some of them were we had the satisfaction of being assured by a man who had spent twenty years in studying cinque-cento painting in Italy, and who passed for one of the best judges of such painting in New York. We incline to the opinion that collectors do best to buy their pictures without knowing or caring who their reputed authors may have been, and, according to the newspaper accounts, Mr. Aspinwall and his son-in-law, who made many

journeys to Europe together for the sake of buying pictures, followed this rule, trusting their own judgment, which they fortified by examination of the accessible works of the schools to which they devoted their attention, rather than the representations of dealers. It was their custom to devote each trip to a certain small portion of Europe, which they could thoroughly ransack for such pictures as were purchasable; and it would be strange if two men of such intelligence, possessors already of pictures of unquestionable merit, could not, in thirty visits to those parts of Europe where the great schools of painting flourished, and where countless pictures must have been produced at the time when art was fashionable, have learned to distinguish for themselves the handiwork of the artists whose pictures they sought. Moreover, there were, twenty-five or thirty years ago, many more purchasable examples of the great Italian, Spanish and Dutch schools than there are now, and even now they are not altogether unattainable, so that, supposing half of the Aspinwall and Renwick pictures, which were united in one collection at Mr. Aspinwall's death, to be spurious, there is certainly room for believing that the other half may be genuine. If they are genuine, their value to the Metropolitan Museum will be incalculable. In comparison with the richness of the Museum collections of modern pictures, its poverty in works of the Italian schools of the sixteenth century is all the more striking, and the Renwick-Aspinwall collection of what one newspaper reporter contemptuously calls "red and blue Madonnas" must be indeed a monument of gullibility and folly, if it does not contain enough of the spirit of the greatest school of art that the world has ever known, to serve as inspiration to many of the students who, as we hope, are to raise our country to the highest rank in the artistic world, and who, at present, need nothing so much as the guide and standard which is to be found in the work of the Classical school.

MR. HOLMAN HUNT, who is favorably known in the artistic world for his investigations into the chemical reactions of pigments, delivered a lecture recently, in which he explained the difference between French and English art, by saying that the latter was founded on love, and the former on hate. His auditors seem to have been quite delighted at having this difficult question solved so clearly, and abstracts of his lecture have ever since been circulating through the English newspapers, no doubt to the great edification of their readers. So far as Americans are concerned, we fear that Mr. Hunt's explanation of the matter is rather too delightfully simple for what Mr. Ruskin calls their "peasant" wits. For ourselves, we confess, without hesitation, that, not being gifted with Mr. Hunt's and Mr. Ruskin's insight into other people's motives, we had supposed the main difference between French pictures and English ones to be that the former usually looked like something in nature, while the latter did not; but we are quite willing to apologize for the superficiality of our observation, and to beg that these critics will condescend to enlarge upon their too brief deliverances. For, as it is evident that both love and hatred must have some object, it is not only interesting, but important to know what it is that English artists love, and French ones hate, so that we peasants, in our humble way, may cultivate similar sentiments toward the objects thus kindly pointed out to us. To illustrate what we mean, we might, perhaps, venture to suggest that the love with which, as Mr. Hunt informs us, English artists are filled, has seemed to us, in some of the more renowned members of the profession, to be bestowed upon dirty color, affected expression and ridiculous drawing; while the spirit which animates French painters, and which, as Mr. Hunt says, is nothing but hate, is, as we are now quite convinced, really and truly a violent manifestation of that terrible passion, directed at affectation, pretence and artistic humbug generally. It is a little curious that such infernal thoughts, boiling eternally in their evil souls, should be able to inspire Jules Bréton, and Feyen, and Bonvin, and Haquette, and Frère, and a multitude of other French artists, with the sweet and simple thoughts which their canvases render immortal for the advantage of their fellow-men, while the loves of Mr. Walter Crane, and other lights of the English artistic world, seem to be unable to embody themselves in anything but soulless caricature; but, as we have just explained, everything depends upon the object toward which the sentiment of

the artist is directed; and, if our artists cannot exhibit any sentiment more pleasing to the great English critics, they may, at least, console themselves with the idea that an energetic hatred and contempt for literary claptrap, ignorant self-assertion, and shams, falsities and hypocrisies of all descriptions, is, so far as the example of the French painters can teach us, about as good a preparation for their work as the present range of human sentiment affords.

A MR. RIMINGTON has been exhibiting in London a curious instrument, intended, as he says, for the development of a new art. This art is based, as he explains it, on the fact that sound and light are both produced by vibrations of elastic media; and that variations in color are produced by variations in the rapidity of vibration of the luminiferous ether, as variations in sound are produced by changes in the rapidity of vibration of the air. It is well known that the violet waves of the spectrum are about half the length of the red waves, just as the air, in producing a given note, vibrates twice as fast as in producing the same note an octave below; and the observation which every one has made, that the violet band of the spectrum shades at its outer, or most quickly-vibrating extremity, into a decided red, as if echoing the true red rays at the most slowly vibrating end of the spectrum, has been taken as indicating that, beyond the color-octave visible to our eyes, another octave of invisible color may begin, just as, in music, a second and third and fourth octave are formed by sound waves vibrating with twice or three times or four times the rapidity of those in the first, or lowest octave. These analogies between the two sorts of vibrations, besides others in the way of interference and so on, are quite sufficient to tempt philosophers of a speculative turn to further investigation, and Mr. Rimington has had the ingenious idea of constructing an instrument which, at the same time that music is played, throws upon a screen light of the color in the spectral scale corresponding to the given tone in the musical scale. The exhibition of this instrument at St. James's Hall drew a great concourse of people, including, as the *Builder* informs us, a considerable number of architects. Considering that only one color-octave is visible to our eyes, the musical part of the entertainment can hardly have been very varied, but the combinations of color which appeared on the screen in correspondence with the chords were extremely curious. The editor of the *Builder*, who joins to his other accomplishments a remarkable knowledge of what may be called the possibilities of music, observes, with justice, that Mr. Rimington's system assumes a connection between sound and color which is almost purely arbitrary, since the notes of the musical scale are entirely conventional, and the selection of the colors corresponding to them must be, in our present knowledge of the laws of light, to a great extent conventional also, while the vibrations of the air differ in many ways from those of the ether. Mr. Statham himself makes a very curious suggestion, saying that, many years ago, the idea occurred to him of the possibility of composing light-symphonies, similar in some respects to musical compositions, and consisting in the exhibition of colored decorative forms, all based on what may be called a given melodic idea, successively and rhythmically on a screen. This sort of exhibition would be quite independent of any musical accompaniment, which, in the present state of our knowledge, could hardly be anything more than a burden and distraction, and Mr. Statham is undoubtedly right in thinking that an art of this sort might be carried to a high development. Meanwhile, Mr. Rimington's experiments will have an interest of their own. The interference and polarization of sound-waves has long been the subject of laboratory study, and, in return, color-chords can certainly be investigated with profit.

M. CHARLES LUCAS, in *La Construction Moderne*, gives a translation of the instructions written, about A. D. 500, by Cassiodorus, secretary and counsellor of Theodoric, King of the Goths, to two architects, Aloisius and Daniel, to whom the King had resolved to confide the direction of the work on certain new palaces and other buildings. Although Theodoric was, in many respects, more than half a savage, and reigned over a people more savage still, he understood and appreciated architectural art, as his buildings at Ravenna, his capital, still attest; and his secretary, one of the most accomplished men of the age, understood the duties of an

architect much better, apparently, than modern public functionaries do. After speaking of the beauty of the existing palace, at Ravenna, and of the pleasure that the King took, in his hours of leisure, in contemplating its perfections, Cassiodorus goes on to say that the architects will be expected, in their future work, to aim at the same artistic perfection. As an equipment for their task, he advises them to read frequently Euclid, in order that they may "engrave upon their minds," the "astonishing variety of figures with which he has enriched his book on geometry," and to have also "ceaselessly under their eyes the lessons of the profound Archimedes and of Metrobius," in order that they "may be fitted to produce new master-pieces." In regard to the style to be adopted in their designs, the secretary advises them that they will be expected "to attend diligently to the maintenance in its pristine splendor of everything antique," and, where they make additions to old work, to construct what they add "in the same taste." "For," as the secretary says, "just as a beautiful body ought to be clothed with a uniform color, so it is fitting that the same beauty and the same style should reign in all the members, and all the parts, of our palace." It will be observed that Cassiodorus seems to have been quite unmindful of the English reviewers who were to come after him, and who know, out of their infinite self-consciousness, that the mediævals and their predecessors, when they made additions to an older building, always made them in the style of their own day, instead of conforming to that of the original building; but it is a misfortune inseparable from chronological distance, that the earlier writers are unable always to conform to the sentiments which the later ones attribute to them. No doubt, if Cassiodorus had had the advantage of reading the works of Mr. Ruskin, or of seeing an Englishman's tennis costume, he would have modified his expressions on these subjects.

AS to what the architects would have to do, after their appointment, Cassiodorus informs them that they will be expected "to direct the mason, the sculptor in marble, the workmen in stucco and plaster, and the painter in mosaic." "You are required," he says, "to teach them that of which they are ignorant, and to resolve the difficulties proposed to you by that army of people who work under your guidance, and must have recourse to the light of your judgment." "You see," he adds, "what various knowledge must be possessed by him who has so many people to instruct; but you will reap the fruit of your labors, and the success of their work, which you have so well directed, will cast honor upon you, and will be your most grateful recompense"; and, still further to inspire them, he exclaims, "what more honorable employment, what more glorious function, than this which enables you to transmit to the most distant ages the monuments which will secure for you the admiration of posterity." After this, Cassiodorus seems to have been seized with a nervousness, for fear that the architects might use their opportunity to fill their pockets with money that did not belong to them, for he adds, that these honors will come to the architects only "if a mean cupidity never induces you to deprive the workmen of a part of our munificence." "Such men," he says, "obey readily, if they receive fair and adequate wages, without fraud or deduction. A generous hand encourages the genius of the arts, and all the ardor of the artist binds itself to his work when he is not disturbed by anxiety about subsistence." After this hint, he concludes by holding up another alluring view of the rewards of probity and skill. "Observe, further," he says, "what are the distinctions with which you are clothed: you march immediately before our person, in the midst of a numerous cortège, holding the rod of gold in your hands, a prerogative which, while entitling you to a place so near us, announces that it is to you that we have confided the execution of our palace." Considering the success with which the work of Theodoric and his architects was crowned, the idea of encouraging the latter by giving them gold rods to carry in procession seems to have been an excellent one, and we commend it to the attention of modern public bodies. Nowadays, the architect of a great public building is generally quite ignored by the functionaries for whom it is built. They take care to have their own names inscribed upon it, but disdain to allow that of the artist who created it to appear. The latter does not generally repine much at his exclusion from their company, but it is quite probable that if they would imitate Theodoric the Great, and show decent consideration for him, they would be more zealously, if not more successfully, served.

ENGLISH COUNTRY CHURCHES.

CHEWTON MENDIP, SOMERSET.



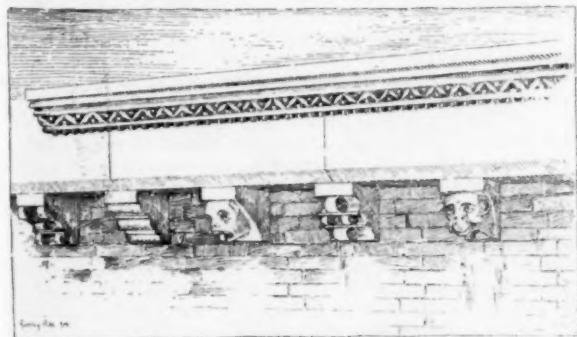
Norman North Door, Chewton Mendip, Somersetshire, Eng.

third ring of the door-head arch being of a simple early Norman character. Very little of the details of the carved ornament of the capitals is still discernible.

The corbels under the bit of entablature which remains on the north chancel wall are less worn, having been protected under the overhang. There is a bit of the old wall left above the door. The stones of this are carefully jointed, but the masonry is not so perfect as in some existing examples of later Norman work.

There are, here and there throughout England in small churches, many such doorways surviving the entire remodelling of the churches to which they belonged. They were preserved, doubtless, as the only ornamented portions of those buildings. The Norman style sought more after simple massive effects than for ornament. The great churches built throughout England after the Conquest were gloomy and grand, but had less ornamental detail about them than the smaller ones they displaced. Norman Romanesque had already made its appearance in England in the time of Edward the Confessor, who introduced the style in his church at Westminster, in 1065, but after the Conquest the numerous incoming Norman clergy, who immediately invested every religious establishment of any value, imposed the style upon the whole of England. Its period extended to the end of the twelfth century.

There was a freer use of ornament in the later Norman, ornament applied mostly to doors, where it sometimes attained great richness. The walls retained for the most part their massive plainness. The insertion of columns in the jambs of doorways belongs to middle and later Norman. The cushion capitals, peculiar to the style, bear a rude resemblance to the Doric of Greece, while there was a sort of Ionic feeling in earlier capitals. Later ones approached the type of the Corinthian, and with this development of the style forms grew lighter and surface enrichment more elaborate, though still concentrated



Cornice of North Chancel Wall, Chewton Mendip, Somersetshire, Eng.

upon isolated portions, while the masonry was of the most finished workmanship.

With the awakening of Gothic invention Norman work took on a transitional character with some very elaborate and beautiful treat-

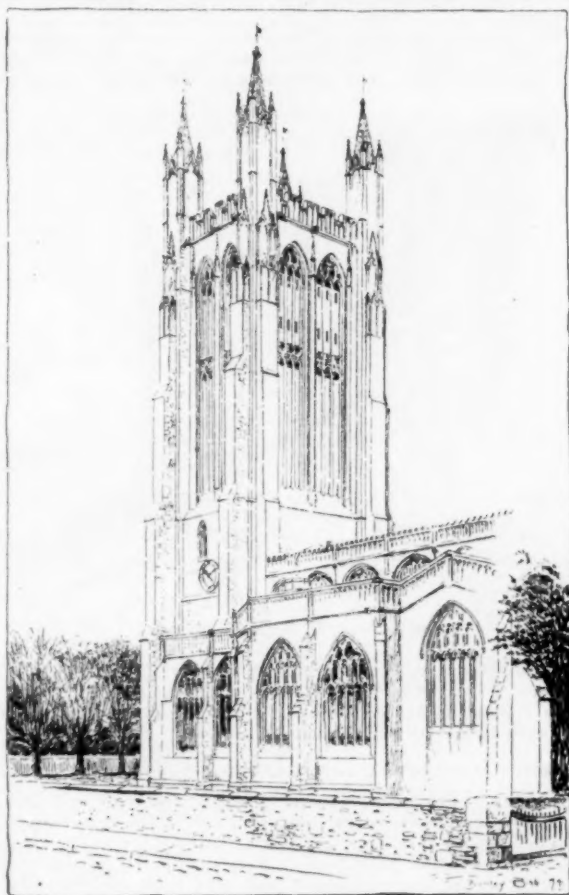
ment of mouldings and rich detail, a very splendid example of which is existing in the glorious ruin of St. Joseph's Chapel at Glastonbury.

SAINT CUTHBERT'S, WELLS, SOMERSET.

In Saint Cuthbert's at Wells, we have a good example of the larger Perpendicular parish churches. In this church, which underwent in late Gothic times a complete transformation, there is little or nothing of importance from an earlier period: everything is in the later thoroughly developed Perpendicular manner. The tower is particularly characteristic of the style, and is certainly a most beautiful example of it. Nothing could be more entirely English than its treatment. Gothic was in its last stage in England, where its latest development had taken a form peculiar to that country, characterized by tremendous windows of formal tracery in the great churches, and a striking adherence to the use of the right line through the body of its structure and ornamental work.

The square-headed window came more into use in church work and was made very effective with vertical tracery. It was the time of western towers, and the most of English churches built one during that period.

Saint Cuthbert's is, in fact, a type of the large parish churches, not a minster church, that is not belonging to a college or monastery,



St. Cuthbert's, Wells, Eng.

which grew up in England in the Perpendicular period, especially in the West. These edifices may be said to contain what was best and most individual among the features of the vertical style.

The roof-pitch was quite low. On the outside the roof was hidden by a stone parapet, usually battlemented, as in the drawing of Dynder Church here given. Interiorly the roof was of very striking importance. There was no stone-vaulting usually, except here and there a bit of fan-vaulting, as at Saint Cuthbert's inside the tall arch which opens from the tower into the church, but the whole body of the church was covered by a low-pitched tie-beam wooden roof, rendered very beautiful and interesting with panelling and carving. The character of these roofs is suggested in the accompanying drawing of the nave of Saint Cuthbert's [See Illustrations]. They did not vary much in treatment from this one.

At Taunton, Saint Mary Magdalene's has a rich and beautiful wooden roof of this style, and Saint Thomas's, Exeter, shows two or three interesting forms of treatment. In the latter, the carved mouldings of roof-beams otherwise unpainted are picked out with color in red or blue and white, with occasionally, if I remember aright, a little gold. The wood itself is a splendid old brown, from age. The whole effect of the roof is dark, but the abundance of lace-like ornamental work lightens this impression. I think the angels were originally in white, perhaps white wood; they now look gray.

The armorial bearings on the shields they hold were done in their proper heraldic colors.

The roof over the aisle of Saint Thomas's, in Exeter, is good in the matter of the absence of the trefoil ornament under the beams, which suggests rather what we would to-day term "jig-saw work," and in a greater simplicity and solidity in the strut pieces. The pitch, too, is lower.

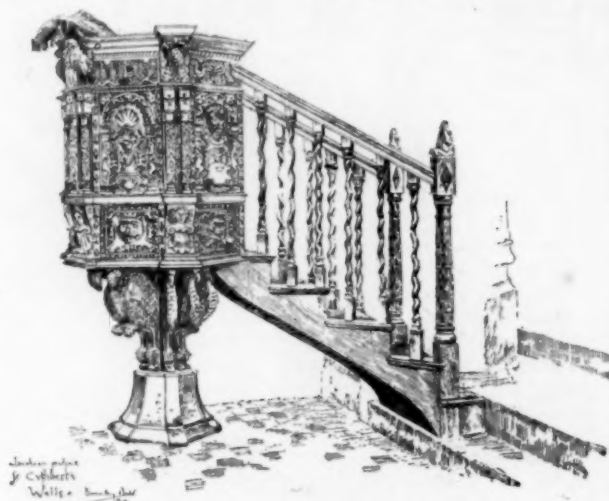
The slight lifting of the line of the tie-beam out of the horizontal is effective in the Saint Cuthbert's roof. The transition from the walls to roof is effected easily and agreeably by the manner in which brackets curve down from the tie-beams to rest upon short wooden columns, which are carried by stone pilasters borne on corbels, upon which are carved angels with books and shields.

There is no lack of homogeneity in the use of the wood and stone together in this way, nor does one regret the loss of the noble stone-vaulting of the earlier styles. In the smaller churches there were cradle-roofs at this time, and in the east of England the great hammer-beam roof was in use.

In the tower the principal changes to be noted were the absence of spire — not often found in Somersetshire Vertical churches — and the treatment of the battlemented parapet and enriched pinnacles.

At Chewton Mendip, as at Saint Mary Magdalene's, Taunton, the parapet is pierced very richly, but I preferred Saint Cuthbert's as an example because of the noble effect of its tall doubled belfry windows.

The visitor to Wells, if he has time and can tear himself away from the absorbing interest of the Cathedral and its surroundings, will find Saint Cuthbert's very charming. At least, he will often



Jacobean Pulpit, St. Cuthbert's, Wells, Eng.

look toward the west, where its tall square tower rises, and admire the grace of its four tall pinnacles, cutting against the sky.

The drawing of the Jacobean pulpit is given as an example of many such to be found in England.

CREECH SAINT MICHAEL, NEAR TAUNTON, SOMERSETSHIRE.

This simple village church standing in its quiet church-yard, in a very sleepy and inconsequential place not over three miles from the Town of Taunton in Somerset, at which latter the traveller of architectural bent will find an interesting monument of Perpendicular in the richly carved and elaborately pinnacled tower of Saint Mary Magdalene's, lately restored under Sir Gilbert Scott, this modest little Church of St. Michael of Creech St. Michael seems hardly worthy of much study. Having happened upon it one day and enjoyed there some hours of peaceful sketching, I give here the results for what they are worth [See Illustrations].

The old building labors under the disfigurement of a very rusty coat of stucco, doubtless the work of some Georgian vandal warden, and from under this cracked and dropping skin its few beauties of carving and tracery struggle with difficulty into view.

The square tower suggests in the lancet windows of its middle stage an early origin, and in the pilaster buttresses on its angles with the corbelling between them even an earlier date.

The traceries in the large windows of the west end of nave and north aisle are interesting examples of the later manner of continuing the mullions through the tracery which distinguished the Flowing and Perpendicular styles from the preceding Geometrical treatment. These windows at Creech are effective. The forms had still more or less ease and grace of line. Later, Perpendicular tracery took on a formal regularity which Mr. Ruskin finds too full of a monotonous panelling and tiresome repetition of rectangular division of spaces. The style did, in fact, have its origin in a particular treatment of wood-panelling at Gloucester Abbey, somewhere about 1300, where the use of the straight line in place of the curved one in the tracery was developed.

William of Wykeham impressed the style in its later thorough

development upon the whole of England, at the end of the fourteenth century, and in the work of his pupil, Thomas de Beckington, Bishop of Bath and Wells, are to be admired some of its most splendid results.

A. B. BIBB.

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a. Must be erected in accordance with the rules for high-potential conductors.

b. Must be separated not less than 12 inches, and be provided with an approved fusible cut-out, that will cut off the entire current as near as possible to the entrance to the building and inside the walls.

[Section b. An approved fusible cut-out must comply with the sections of Rules 23 and 24 describing fuses and cut-outs. The cut-out required by this section must be placed so as to protect the switch required by Rule 17.]

The conditions to which outside wires are exposed are such that no difference can be made between the construction used for high-potential circuits and that used for low-potential circuits. Although there is less liability of leakage where the electrical pressure is low, there are still all the bad effects when leakage does occur and it is not advisable to attempt less rigid requirements. Rules under Section 10 accordingly apply also to low-potential circuits.

The fusible cut-out required just inside the walls is similar to that required for motors, shown in connection with Rule 8 (a). As with motor circuits, the cut-out is to be double-pole and it is to be placed as near as possible to the point where the wires enter the building, so that the whole of the interior wiring may be protected. If it were some distance away from the entrance, cross connections between the wires at any point lying between the cut-out and the wall would not melt the fuse in the cut-out, because the extra current would not pass through the fuse.

16. UNDERGROUND CONDUCTORS : —

a. Must be protected against moisture and mechanical injury, and be removed at least two feet from combustible material when brought into a building, but not connected with the interior conductors.

b. Must have a switch and a cut-out for each wire between the underground conductors and the interior wiring when the two parts of the wiring are connected.

These switches and fuses must be placed as near as possible to the end of the underground conduit, and connected therewith by specially insulated conductors, kept apart not less than two and one-half inches.

[Section b. The cut-out required by this section must be placed so as to protect the switch.]

c. Must not be so arranged as to shunt the current through a building around any catch-box.

Underground conductors are usually brought into the basement of a building, where it is apt to be damp and where often there is not the best of order, so that it is necessary to take precautions against moisture and the abrasion of the wires that would be caused by piling objects against them. There is apt to be greater carelessness when the wires are simply brought in for future use, so there is the additional requirement in this case, that they be two feet from combustible material, as this might be set on fire were there to be leakage between the wires.

When the underground conductors are connected with interior wires a cut-out is needed for the reason stated under Rule 15 (b). The switch makes it possible to disconnect the interior wires from the main wires whenever necessary. The cut-out to protect the switch must be between the switch and the wall, so that if the switch become defective and allow an excessive current to leak between the wires, this current will pass through the fuse and melt it.

A "catch-box" is a box containing a fuse and is in reality only another name for a fuse-box. The term is applied usually only to the fuse receptacles in the underground street-service. In making the street-connections the wires are sometimes improperly connected so that they are not protected by the fuse in the catch-box, but form a by-path round it through the building.

In Figure 47, for instance, the wiring in the building may first have been connected only with the street mains A, no connection being made with the mains D. While the mains A were supplying all the current, if any trouble occurred so that the mains became connected at B, the excessive current that would flow in consequence at the short circuit would melt the fuse in the catch-box C. Suppose, however, that more lamps have been put in the building and that the current required is greater than the mains A were designed for: In this case there is sometimes another connection made at a point D, so that the current supplying the building will not all have to be

¹ Continued from No. 1015, page 102.

taken through the mains *A*. Now, if a short-circuit occur at *B* the fuse in the catch-box *C*, even though it melt, will not prevent the wires from overheating, because the current can come from *D* through the wiring of the building to *B*. There would, of course, be

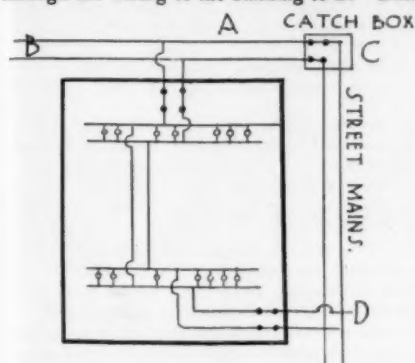


Fig. 47. Current shunted through a building round a catch-box.

into two distinct parts and one fed from each set of mains.

INSIDE WIRING.—GENERAL RULES.

17. At the entrance of every building there shall be an approved switch placed in the service conductors by which the current may be entirely cut off.

[RULE 17 :—

The switch required by this rule to be approved must be double-pole, must plainly indicate whether the current is "on" or "off," and must comply with Sections *a*, *c*, *d* and *e* of Rule 26 relating to switches.]

This "service switch" is placed at the point where the wires enter the building for the same reasons that such a switch is used with high-potential circuits. [Rule 12 (*b*).] It is usually, however, placed just inside the building instead of outside. It is to be a double-pole switch, that is, one breaking both wires of the circuit as does that used in connection with the motor (Fig. 24). With such a switch, current may at any time be cut out of the building entirely and if a practice be made of turning it "off" every night, there is no question of electrical troubles at a time when no one is about. It is convenient too, when trouble occurs in any part of the installation, for it is not necessary then to wait for the arrival of someone having a knowledge of electric matters, but the current may be immediately cut off from the interior wires. The base of the switch must be of waterproof and non-combustible material, such as slate or porcelain, to prevent leakage and damage from arcing. The form may be like that shown in Figure 24 or it may be a double-pole switch similar to that shown in Figure 36.

18. CONDUCTORS :—

a. Must have an approved insulating covering, and must not be of sizes smaller than No. 14 B. & S., No. 16 B. W. G., or No. 4 E. S. G., except that in conduit installed under Rule 22, No. 16 B. & S., No. 18 B. W. G., or No. 4 E. S. G. may be used.

[Section *a*. In so-called "concealed" wiring, moulding and conduit work, and in places liable to be exposed to dampness, the insulating covering of the wire, to be approved, must be solid, at least three-sixty-fourths of an inch in thickness, and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70 degrees Fahrenheit, and three days' submersion in lime-water, with a current of 550 volts, and after three minutes' electrification.

(See List of Wires, page 35.)

For work which is entirely exposed to view throughout the whole interior circuits, and not liable to be exposed to dampness, a wire with an insulating covering that will not support combustion, will resist abrasion, is at least one-sixteenth of an inch in thickness, and thoroughly impregnated with a moisture repellent, will be approved.]

It will be noticed that the insulating covering of wires used for low-potential wiring is to be the same as that required for high-potential wiring except where the work is entirely exposed to view throughout the whole interior circuits, and not liable to be exposed to dampness. For these excepted places the better grades of the wire termed "Weatherproof" meet the requirements. So-called "Underwriters'" wire is not allowed under any conditions.

No. 14 B. & S. (Brown & Sharp Gauge), No. 16 B. W. G. (Birmingham Wire Gauge), and No. 4 E. S. G. (Edison Standard Gauge) are all of nearly the same size, about one-sixteenth of an inch in diameter. The B. & S. gauge is the gauge commonly used in this country. No wire smaller than No. 14 B. & S. gauge is allowed except in conduit, because it is otherwise not strong enough mechanically. Small wires strung on ceilings may easily become

stretched and thus not only be more liable to further damage, by the displacement, but the sectional area may by this stretching be so reduced that the wire will heat when the normal current passes.

b. Must be protected when passing through FLOORS; or through walls, partitions, timbers, etc., in places liable to be exposed to dampness by waterproof, non-combustible, insulating tubes, such as glass or porcelain.

Must be protected when passing through walls, partitions, timbers, etc., in places not liable to be exposed to dampness by approved insulating bushings specially made for the purpose.

[Section *b*. Second paragraph. Except for FLOORS, and for places liable to be exposed to dampness, Glass, Porcelain, metal-sheathed Interior Conduit and Vulca Tube, when made especially for bushings, will be approved.]

The two last named will not be approved if cut from the usual lengths of tube made for conduit work, nor when made without a head or flange on one end.

c. Must be kept free from contact with gas, water or other metallic piping, or any other conductors or conducting material which they may cross (except high-potential conductors) by some continuous and firmly-fixed non-conductor creating a separation of at least one inch. Deviations from this rule may sometimes be allowed by special permission.

d. Must be so placed in crossing high-potential conductors that there shall be a space of at least one foot at all points between the high and low tension conductors.

e. Must be so placed in wet places that an air-space will be left between conductors and pipes in crossing, and the former must be run in such a way that they cannot come in contact with the pipe accidentally. Wires should be run over all pipes upon which condensed moisture is likely to gather, or which by leaking might cause trouble on a circuit.

f. Must be so spliced or joined as to be both mechanically and electrically secure without solder. They must then be soldered, to insure preservation, and covered with an insulation equal to that on the conductors.

[Section *f*. All joints must be soldered, even if made with the McIntire or any other patent splicing device. This ruling applies to joint and splices in all classes of wiring covered by these Rules.]

Rule 18 (*b*) is not always properly read. Non-combustible tubes are always required in floors, but in walls, partitions, etc., they are required only in places liable to be exposed to moisture. [See remarks under Rules 3 (*c*) and 12 (*a*).] The only tubes in addition to non-combustible tubes thus far approved for dry places are the makes mentioned in the note under Rule 18 (*b*).

Rule 18 (*c*) is made to insure proper insulation of the wiring from the ground. (Figure 10 and remarks.) The wire, if not rigidly fastened so that it will be held away from conducting material, may by being struck or by sagging, come into contact with the conductor. While the aim of the rule is to keep the wire away from conducting material of any kind, the greatest danger comes from pipes because they are directly connected with the earth. Construction similar to that shown in Figure 48 will insure the separation. Conductors that are not connected directly with the earth, such as a nail driven into a beam, appear sometimes to be harmless, but it should be remembered that whereas a slight contact between the wire and the beam itself might result in virtually no leakage, a driven nail presents a comparatively large surface to the wood, and contact with the nail might in this case result in a considerable leakage and cause dangerous sparking.

Construction is allowed with low-potential systems that is not allowed with high-potential systems, and Rule 18 (*d*) is made so that there can be no possibility of contact between the two.

An air-space is required where wires cross pipes in damp places, because there would be danger of leakage over the surface of any material between the two, if this material were damp. If wires are

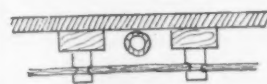


Fig. 48. Showing wire held away from a pipe which it crosses.



Fig. 49. Condensed water forming connection between pipe and wire.

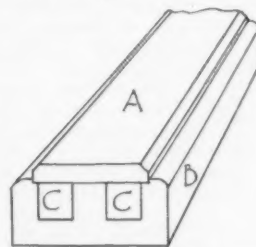


Fig. 50. Moulding: A. Capping; B. Backing; C. Grooves for wire.

run under pipes on which moisture gathers, the moisture may cause a cross connection between the pipe and the wires. (Fig. 49.)

All joints are to be soldered as with high-potential circuits. [See Rule 10 (*f*).]

SPECIAL RULES.

19. WIRING NOT ENCASED IN MOULDING OR APPROVED CONDUIT:—

- a. Must be supported wholly on non-combustible insulators, constructed so as to prevent the insulating coverings of the wire from coming in contact with other substances than the insulating supports.
- b. Must be so arranged that wires of opposite polarity, with a difference of potential of 150 volts or less, will be kept apart at least two and one-half inches.
- c. Must have the above distance increased proportionately where a higher voltage is used.
- d. Must not be laid in plaster, cement or similar finish.
- e. Must never be fastened with staples.

"Moulding" is made in two pieces so as to wholly encase the wire, and it thus acts as a protection to the insulating covering. (Figure 50.)

"Conduit" is tubing that serves as a race-way or channel for wires, the building being piped with it as if for water or gas and

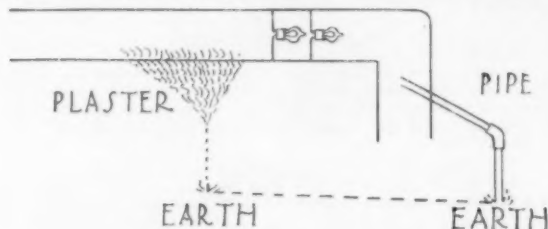


Fig. 51. Wires grounded through moist plaster and pipe, thus forming a cross connection between the two sides of the circuit.

the wire then run inside, so that the whole wiring installation is isolated and protected. (Rules a—g.)

The two wires of a circuit are wires of "opposite polarity." The convention has been adopted of calling the side of the dynamo from which the current is supposed to start the positive or + pole, and the side to which the current returns, the negative or — pole. The wires leading from the dynamo are thus spoken of as being of opposite polarity, one being the positive pole, and the other the negative pole of the circuit.

It will be noticed that there are only three approved ways of running wires: in moulding, in conduit, and wholly on non-combustible insulators. The intention of the Rule 19 (a) is to prevent possibility of leaks, and also to have the wire in contact only with non-combustible material so that no harm will come in case the wire gets excessively heated by a heavy current. While everything is perfectly dry there is no danger of leakage to wood for instance, and it was formerly the practice to fasten the wire directly against wooden ceilings; but it is not known when conditions may change by the spilling of water, or the leaking of roofs, and moreover the allowing of a poorer construction in some cases leads to the adoption of this construction in places where it is not at all suitable. There is then continually a necessity of drawing lines and it is but little more costly, but much safer and more satisfactory to use the construction everywhere, that is everywhere good.

A very short air-space is sufficient insulation with such pressures as are used in practice, but the distances between wires, specified in Rule 19 (b), are required because wires that become slightly loose are apt to come together unless they were originally some distance apart, and because leakage may take place over damp surfaces, and it is wiser not to make these distances too short.

Rule 19 (a) covers the construction mentioned in Rule 19 (d), but it is brought out specifically in the latter rule to give greater prominence and because it might be thought that plaster and cement were non-combustible insulating materials. On the contrary, they are fair conductors when moist and moreover they act on the insulating covering of the wire, destroying the insulating properties after a time.



Fig. 52. Metal staple.

Even though no harm were done at the point where the leakage takes place in the plaster, such leakage might "ground" one side of the circuit and thus make possible at another point, as at a gas-fixture, a short circuit that would burn through the pipe and ignite the gas (Fig. 51). The ordinary staple (Fig. 52) is of course a direct violation of Rule 19 (a), but staples are made that are insulated and that keep the wire out of contact with other substances. (Fig. 53.) These are also prohibited, however, for in fastening the wire with them they are driven into the wood and are liable to injure the insulating covering of the wire.

IN UNFINISHED LOFTS, BETWEEN FLOOR AND CEILINGS, IN PARTITIONS AND OTHER CONCEALED PLACES.

f. Must have at least one inch air-space surrounding them.

g. Must be at least ten inches apart when possible, and should be run singly on separate timbers or studding.

h. Wires run as above immediately under roofs, in proximity to water-tanks or pipes, will be considered as exposed to moisture.

i. When from the nature of the case it is impossible to place concealed wire on non-combustible insulating supports of glass or porcelain, the wires may be fished on the loop system, if encased, throughout in approved continuous flexible tubing or conduit.

j. Wires must not be fished for any great distance, and only in places where the inspector can satisfy himself that the above rules have been complied with.

k. Twin wire must never be employed in this class of concealed work.

Wires are said to be "fished" when they are started in at one end of a concealed space and are then felt for, or "fished" for, from the other end, with a hooked wire or other contrivance so that they may be pulled through. Such a procedure leaves doubt of course as to the condition in the space between the entrance and the exit. Figure 54 illustrates wires "fished on the loop system." The idea of the rule is to provide for construction in old buildings where it is not possible to conceal the wire by means of such construction as would be employed in new buildings. According to the rule, wire in a flexible conduit may be fished just as the wire alone would be fished, and is threaded-in through concealed spaces so that it makes the tour, so to speak, of all points where lamps are to be connected. The object of confining this construction to the loop system is to prevent joints being made in concealed spaces. The construction is intended principally for installations in which only a small number of lamps are used.

"Twin wires" are two wires laid together and surrounded and separated by insulating material, so that the whole forms one piece while the wires are separate conductors and form the two sides of the circuit. (Fig. 55.) Of course any jamming or bruising of this piece is apt to bring the two sides of the circuit into contact and thus form a short circuit.

In concealed spaces more rigid requirements are necessary than with open work, because the construction cannot be easily examined, any defect is more serious, and there is no temptation on the part of the workman to slight the work. Compliance with Rule 19 (h)

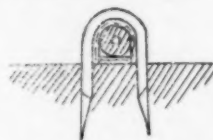


Fig. 53. Insulating staple.

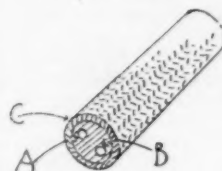


Fig. 55. Twin wire: A. Copper wires; B. Rubber insulation separating and surrounding copper wires; C. Braided outer covering.

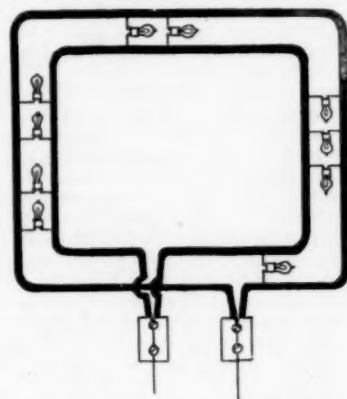


Fig. 54. Flexible conduit, run on the loop system.

requires non-combustible insulating tubes to be used where wires pass through walls, wood, etc., and allows only such wire and insulation as specified for places exposed to moisture.

20. MOULDINGS:—

a. Must never be used in concealed work or in damp places.

b. Must have at least two coats of waterproof paint or be impregnated with a moisture repellent.

c. Must be made of two pieces, a backing and capping, so constructed as to thoroughly encase the wire and maintain a distance of one-half inch between conductors of opposite polarity and afford suitable protection from abrasion.

Moulding is simply a protection against mechanical injury and in damp places may be even worse than nothing about the wire, since an air-space is an insulator while wet wood is a fair conductor. In dry places, however, it guards against mechanical injury to the insulating covering of the wire, and is a sufficient insulator. Saturating the moulding with a substance that will prevent the absorption of moisture guards against the danger of leakage in case of accidental conditions. The moulding is of course an additional danger in case of overheated wires, and while its use is allowed in a limited way it is not thought to afford first-class construction.

21. SPECIAL WIRING:—

In breweries, packing-houses, stables, dye-houses, paper and pulp mills, or other buildings specially liable to moisture or acid, or other fumes liable to injure the wires or insulation, except where used for pendants, conductors—

a. Must be separated at least six inches.

b. Must be provided with an approved waterproof covering.

[Section b. The insulating covering of the wire to be approved under this section must be solid, at least three-sixty-fourths of an inch in thickness and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70 degrees Fahrenheit, and three days' submersion in lime-water, with a current of 550 volts after three minutes' electrification, and must also withstand a satisfactory test against such chemical compounds or mixtures as it will be liable to be subjected to in the risk under consideration.]

c. Must be carefully put up.

d. Must be supported by glass or porcelain insulators. No switches or fusible cut-outs will be allowed where exposed to inflammable gases or dust, or to flyings of combustible material.

e. Must be protected when passing through floors, walls, partitions, timbers, etc., by waterproof, non-combustible, insulating tubes, such as glass or porcelain.

The requirements stated under Section 21 are, it will be noticed, simply more exacting than those for work subject to ordinary conditions. Rule 21 (d) meets a special condition that sometimes exists, and is made necessary because the action of switches and the melting of fuses cause an arc of short duration that might ignite gases or finely divided dust. The wire in these special places must stand a more severe test and the list of approved wires given under Rule 10 (a) is not necessarily correct for all these special conditions.

RUSSELL ROBB.

(To be continued.)

DELPHI.

FROM time to time during the past three years the *Builder* has drawn attention to the progress of the French excavations at Delphi, but for any more systematic account it has been necessary to wait for two things—first, the issue of a plan of the excavations; and, second, the opportunity for visiting Delphi in person and studying on the spot the topography of the site, the ground-plans of temples, treasures and votive offerings, and the sculptured and architectural monuments now stored in the local museum. It was our exceptional good fortune to visit Delphi in company with the Director of the French School, M. Homolle, and to hear from his lips his views as to the date and interpretation of the various buildings he has discovered. These views have been in the main laid before the public abroad in various conferences held at the French School at Athens and elsewhere, and are in part also published in recent numbers of the *Bulletin de Correspondance Hellénique*,¹ so we violate no confidence in placing them at some length before our readers. That the nation which discovers should be the first to publish is the most elementary rule of archaeological etiquette; we are unable, therefore, at present to offer any reproduction of the as yet unpublished photographs of the sculptures discovered.

To any one who visits Delphi the first impression is of loss, the inevitable loss of the picturesque; old Kastri, the village that used to poise so beautifully on the steep slope, is gone for ever to make way for a Decauville railway, the bareness of freshly upturned earth, and a few dismal-looking ground plans. But let him once set his foot upon the Sacred Way, and regret is lost in a new and keener interest.

We must strictly limit our account by the plan before us (drawn up by the engineer, M. Couvert, and follow the Sacred Way just so far as it takes us—no farther—i. e., from the beginning where it enters the precinct at the right hand of the plan to the Treasury of the Athenians, the last building sketched in. The Temple of Apollo is not included; at the time we visited the excavations, though the ground-plan was substantially complete, the whole site was not quite cleared, so it must wait a future occasion for discussion. Our method will be—Pausanias in hand—to follow just this small section of the Sacred Way, and see how far we can compare, how far supplement his account.

Pausanias (x., 9 ff.) approaches Delphi from Daulis, and therefore enters the precinct from the east. At the entrance (*εἰσέλθοντι δὲ ἐς τὸ τέμενος*) stood, he says, a brazen bull by Theopropos of Ægina, the offering of the people of Corcyra. The bull, by his bellowing, had brought a herdsman down to the sea, and showed him a large shoal of tunny-fish. The pious bull wrought for his own destruction, for the fish could not be caught till he was sacrificed to Poseidon. From the proceeds of the catch the people of Corcyra dedicated his brazen effigy. The basis of this votive offering has been found *in situ*, but about a hundred metres higher up the Sacred Way, so that this gives us no topographical fixed point.

¹ It may be well at this point to indicate the literature, already considerable, that has grown up round the Delphi excavations, and to which the writer of this article owes much. First in importance come the official reports issued by M. Homolle himself in the *Bulletin de Correspondance Hellénique*, the organ of the Ecole Française at Athens. From the bulletin is taken the plan reproduced here. Two articles of a more popular character by M. Homolle have appeared in the *Gazette des Beaux Arts*, 1893, for February and March, and one somewhat more technical in the *Académie des Inscriptions et Belles Lettres Séance*, November 16, 1894. At a conference at the French School on March 6, M. Homolle gave an address on the results of the excavations collectively, and, on March 20, he discussed the sculptures of the Siphnian Treasury. Of this last address a summary appeared in the *Berliner Philologische Wochenschrift*, April 27. In the same periodical Dr. Furtwängler, 1894, p. 1,276, and Dr. Belger, 1894, p. 863, have given their personal impressions. Last, but not least, we owe much to Dr. Pomtow's discussion of the relation of the discoveries to the narrative of Pausanias, in a paper read before the Berlin *Archäologische Gesellschaft*, and reported in the *Anzeiger*, 1895, vol. x., Heft 1, p. 2.

Any uncertainty, however, as to where Pausanias stands shortly and decisively disappears. Conspicuous in the plan N and S of the Sacred Way, close to the entrance, are two large semicircular structures, marked respectively "Offering of the Argives, Kings of Argos" and "Offering of the Argives, the Epigoni." The southern of these two semicircles was in part laid bare by M. Pomtow in May, 1887; the northern one was brought to light in May, 1894. Its substructure lies about a metre above the pavement of the Sacred Way; a substantial wall of large blocks of stone closes it round to the north. At the foot of this enclosing wall is a low semicircular step, bearing inscriptions. From right to left run the names of Kings of Argos "Ἀβας" Ἀκρίσιος Ἀνγκεὺς Περσεὺς Ἡρακλῆς, and in the ordinary direction, left to right, the name of the artist, Antiphanes of Argos. The difference in direction is no doubt due to the desire to give to the names of these ancient kings a venerable air. This monument M. Homolle believes to have been that seen and described by Pausanias (x. 10, 5). It was dedicated by the Argives who helped Epaminondas and the Thebans in the foundation of Messene. "On it were represented statues of heroes, and the succession of kings that traced their descent to Herakles, or, even further back, to Perseus." It is this row of kings' names that have come to light.

Opposite these statues (*καταντικρὺ*) stood, according to Pausanias, another group—i. e., the statues of the "Epigoni," also erected by the Argives—and these must certainly have occupied the southern semicircle discovered by M. Pomtow. The importance of this conjoint attribution cannot be overestimated. It gives an absolutely fixed topographical point, and enables us to place with almost equal certainty a whole series of other monuments on either side of the way. To get this fixed starting-point we have gone on a little in advance, and must retrace a few steps to the monument marked "Offering of the Lacedemonians." Here no inscription helps us, but the size of the monument, a chamber 25 metres long (not fully drawn in on the plan), and the fact that its east end all but touches the precinct wall, points to two conclusions: the monument contained must have been of extensive size, and must have been seen by Pausanias immediately on entering the precinct. Only one monument fulfils these two conditions, i. e., the pompous trophy of Lysander commemorating his victory over the Athenians at Ægospotamos. It consisted of no less than thirty-seven single statues by various sculptors, nine ranged in front, including Lysander himself crowned by Poseidon, behind them eleven statues of Spartans and their allies who fought at the battle, then another seven (*ἐφεξῆς*) and yet another ten close at hand (*ἐχόμενοι αὐτῶν*). The general disposition of the chamber corresponds to this account. It opens on to the Sacred Way, and contains a large raised basis which appears to have been divided into several steps.

Opposite this Lysander monument again (*καταντικρὺ*), Pausanias saw a monument of Arcadian kings and heroes offered by the people of Tegea from the spoils of the Lacedemonians (369 B. C.); this was again the conjoint work of several artists, among them the Argive Antiphanes. Of this monument the basis, with inscription, was found by M. Pomtow in 1887; it lay just inside the temenos entrance to the south side of the Sacred Way, and consists of a block of black calcareous stone, 1.30 metres broad. There are three inscriptions on the stone, but two are later additions, the one in letters of the fourth century B. C., and consisting of five distichs, is the dedicatory inscription proper. It is fully discussed by its discoverer in the *Mittheilungen* (xiv, p. 15). It seems probable that, as in the case of the Argive kings, the names of the persons represented in the statues were inscribed, and that Pausanias took his account rather from these inscriptions than from the dedication on the basis, which is cut in very small characters. The Arcadian monument, as not found *in situ*, is, of course, not marked on the plan, but it may safely be placed on the south side of the Sacred Way, immediately opposite the Offering of the Lacedemonians. Since this last, as mentioned above, all but touches on the precinct wall, all other monuments seen by Pausanias before he came to the Epigoni must stand on the south side. There are (1) the bull of Theopropos; (2) the "wooden horse" of the Argives; (3) the Marathon trophy; (4) the "Argive" trophy after the battle of Oinæ; (5) the chariot of Amphiaraus.

Here we may pause for a moment to make a reflection in honor of Pausanias. Frequent efforts have been made to disparage his authority as an eye-witness—to make of him a mere compiler, and, in the matter of Delphi, mainly depending on Polemon. Walking along the Sacred Way marking how his adverbs and prepositions fit in on the spot, it is impossible for any sane person to doubt that he actually saw what he describes. Dr. Pomtow, who has done so much for the topography of Delphi, is the first to own this. Another valuable result is that the precise meaning of particular expressions in frequent use by Pausanias comes out with more certainty here than in any other part of his perambulations. It is a relief to know once and for all that here, and consequently on the Acropolis at Athens, *καταντικρὺ* means not merely opposite, but, when there is a road in question, *on the other side*; that *ἐφεξῆς* and *παρὰ* imply immediate consecution on the same side; and *πλησίον* and *ἐγγύς* somewhat less immediate neighborhood, but still on the same side. When a new sentence is begun without indication of connection, it frequently, as Dr. Pomtow observes, indicates transition to the opposite side.

After the statues of the Epigoni the southern side of the Sacred Way is completely destroyed—on the north side its course can be clearly made out by various chambers, fragmentary walls and niches,

but these are all of uncertain attribution. About 20 metres west of the Epigoni we come to a substantial fixed point, i. e., the *Treasury of Sicyonians*. Pausanias passes the building by, merely remarking that neither in this nor any of the Treasuries were there any 'xophara' to be seen in his days. The excavations tell us more. Somewhat below the level of the Sacred Way the foundations in tufa were discovered of a building with the form, the usual form for Treasuries, of a *templum in antis*. The substructure of the building rests at a great depth on solid rock, and consist of fragments of some older building, pieces of the architrave, drums of Doric columns, and remains of some circular buildings; on these are certain stone-masons' marks similar to that found in the foundations of the Theban Treasury, to be noted later. As this building is the first that occurs of the shape fitting to a Treasury, and as the Treasury of the Sicyonians is the first named by Pausanias, there can be little, if any, doubt that the attribution is correct. In and about the foundations were found a number of metope sculptures in tufa, dating evidently about the sixth century B. C. The sculptures themselves are all painted mainly in red and black, the ground has at least preserved no trace of color, the pose of the figures, the rigid gestures and stiff drapery all recall the manner of the black-figured vase-painters; so do the inscriptions that accompany the figures. M. Homolle states candidly that the inscriptions do not present the characteristic forms of the Sicyonian alphabet (e. g. $\Sigma = \Xi$), nor are the myths represented in any way peculiar to or characteristic of Sicyon. Moreover the metopes are a little large and heavy for the proportions of the building, nevertheless, from the condition in which they were found it is impossible to entertain the supposition that they belonged to a previous building and were used up as old material. The subjects are as follow:—1. Idas and the Dioscuri bringing from Messenia the drove of captured oxen. The names are painted in black at the sides of the figures. Very curious, and decoratively very successful, is the pattern made of the manifold oxen legs. 2. A boar, probably part of a representation of the hunt of the Calydonian boar in which the Dioscuri took part. 3. Two horsemen seen *en face*, behind them a ship with warriors, of whom nothing remains but their bucklers, in the centre two figures playing on the lyre, near one of them the letters $\Phi \Lambda \Sigma$. The two horsemen are probably again the Dioscuri, and the scene may be taken from the voyage of the Argonauts. 4. A ram carrying a figure which must be Helle. 5. Curious and very archaic representation of Europa on the bull; she has the oddly compressed waist that appears on early black-figured vases, and she bends forward in an exaggerated pose.

Pausanias mentions the Treasury of the Sicyonians immediately after, a votive offering of the Tarantines, consisting of a group of horses and captive Messapian women by the Argive sculptor Age-ladas; the Sicyonian was near this (*παλαιον*) so we must place the Tarentine group immediately west of the Treasury.

After the Treasury of the Sicyonians, and standing near to it (*παρά*) Pausanias mentions a group of statues dedicated by the Cnidians; they represented Triopas, the founder of Cnidos, standing near his horse, and Leto, with Apollo and Artemis shooting at Tityos, who is represented (as usually on vases) as wounded. These are the only monuments Pausanias mentions between the Treasury of the Sicyonians and that next in order, the Treasury of the Siphnians, so we must place them somewhere in the intervening space.

A few paces farther to the west we reach the Treasury of the Siphnians. Herodotus tells us (iii., 57) that, about the time of the war against Polycrates, the affairs of the Siphnians were in a flourishing condition; "they were the richest of all the islanders, having in the island gold and silver mines, so that from the tenth of the money accruing from thence a Treasury was set up, equal to the richest."

Pausanias, who saw the Treasury next after that of the Sicyonians, adds the further detail that the Treasury was built by order of the Delphic god, and that when in their greed the Siphnians neglected to send the annual tithe, the sea encroached and swept away their mines (P. x., ii., 2). The Siphnian Treasury stands impressively on a sort of rampart at the angle where the Sacred Way turns for the first time. It has the form of a temple with portico, and faces west, the only direction in which it is accessible. All round the Treasury were found not only the frieze, and pediment sculptures to be noted shortly, but a number of architectural fragments amply sufficient to show that the decoration of the building was rich and delicate to no ordinary degree. The whole scheme can be reconstructed. The entire architrave was of Parian marble; above the sculptured frieze came a line of beading, massive and archaic in character; above this a Lesbian cyma, of which many fragments are preserved. The cornice is richly decorated with a band of palmetta and lotus in relief, elaborately colored, the color still remaining with extraordinary freshness. Dr. Furtwängler draws attention to the fact that the decorative forms of these architectural fragments find their closest analogy in vases, not of Attic, Rhodian, or Chalcidian provenance, but rather in the hydriæ of Cere, which are acknowledged to be Ionian in style. Such forms appear to have been very popular at Delphi. The cornice was further ornamented, though probably on the front façade only, with bossed phialæ, the oldest examples of this popular form of decoration.

A building so elaborate and splendid would have been incomplete without sculptured adornment. Happily the frieze and the sculptures of one pediment have been found substantially complete; the sculptures of the west pediment are, however, entirely missing. They must have once existed, as the west is the principal façade and only

entrance. By a most fortunate circumstance the sculptures of the frieze were found substantially where they originally fell, lying on all four sides of the temple, the corner slabs for the most part near the actual angles of the Treasury, so that the arrangement of the whole composition was a work of no very serious difficulty. The total length of the frieze was 28 metres, of which 20 have been found.

To discuss the details of the Siphnian Treasury without illustrations would be an unprofitable task, but a few words on subject and style may be allowed. And first it is noticeable that the technique of the pediment sculptures is distinctly more archaic than that of the frieze. The scene represented is the "Theft of the Tripod." Athene stands in the centre, and—as on a Chalcidian vase with the same subject—holds apart the two combatants, Apollo and Herakles. Behind Apollo are two women figures, Leto and Artemis; behind Herakles also two figures and his chariot. The arrangement is instructive for the history of pediment composition. The figures stand—as Dr. Furtwängler has well remarked, ranged like "organ-pipes," shortening towards either end; the actual angles were more than the artist could cope with, he leaves them unfilled—in fact, the composition is nothing but a bit of frieze cramped into a pediment. The central figures present a peculiarity of technique; the upper parts are worked fully in the round, the lower simply treated as relief. M. Homolle explains this as intended to throw the upper parts into prominence, in order to counterbalance the shadow cast by the tympanum.

When the pediment sculptures are examined side by side with those of the frieze, as they stand in the museum at Delphi, the greater freedom and livelier motion of the frieze sculptures is at once evident. M. Homolle goes further. He sees in the frieze itself the work of the two different artists—the slabs of the south and west sides from the older, those of the north and east to the younger hand. It is certainly noticeable that on the south and west slabs the relief shows but little modelling; like those of the pediment, the edges are cut square as in the well-known Sparta grave reliefs; on the north and east slabs they are more rounded. The composition, too, of these presumably later slabs is more complex.

From the point-of-view of subject, the whole frieze is a mine of mythological interest, and its value is the greater from the fact that nearly all the figures bear legible inscriptions—legible, i. e., when they were first excavated, with letters painted red, some of which were written on the ground of the relief close to the figures, others on the band below the composition, as in the Pergamene altar. Originally, in all probability, every figure, and even the horses and some inanimate objects, had their names inscribed. Many of the inscriptions have disappeared altogether, some are now illegible, but sufficient have been clearly made out to place the subjects and most of the individual figures beyond dispute.

It was hoped at first that these inscriptions might settle the question of the school to which the sculptures belonged. This hope was doomed to disappointment, for inscriptions with letters of just the same form are found on the frieze of Sicyonian treasury, and on the metopes from the treasury of the Athenians. M. Homolle now holds that the inscriptions were painted in at Delphi after the sculptures were set up, and this would explain the uniformity in the alphabet. They are, however, none the less valuable as a clue to the subjects.

These fall into four groups, corresponding roughly to the four sides of the building. On the front (west) façade we have the apotheosis of Herakles. The central slab is unfortunately lost. It may have contained an assembly of the gods. The angles are filled by two chariots turned cornerwards. Athene stands near one of these in the act, apparently, of inviting Herakles to mount the chariot. The horses are winged, and one of them is inscribed "Pegasos." Hebe (inscribed) stands near the other chariot. Near her Niké (inscribed) and a third figure.

Less certain is the position of the next important group, representing the preparations for the chariot-race between the Pelops and Oinomaos. A fragment from this portion of the frieze, containing a chariot, was found long ago. All the important male figures are inscribed, i. e., Pelops, Oinomaos, and Myrtilus, and between the chariots is an altar inscribed as "Altar of Zeus." This detail is of special interest in relation to Dr. Dörpfeld's conjecture that in front of the figure of Zeus in the Olympian pediment an altar may have stood. An altar gives point and emphasis to the scene, and occurs in vase-paintings wherever the contest is represented. The east side contains an Homeric contest over a fallen warrior, inscribed Sarpedon. Menelaos also is inscribed, and Patroklos is evident from the fact that on his shield is written "of Achilles" (*Ἀχιλλεύς*). He is carrying the arms of his friend. The combat is watched by a number of gods on either side, as their sympathies are Trojan or Greek. Some are easily recognizable from their attributes—others, e. g., Nemesis must, but for these inscriptions, have remained uncertain. On the bosom of Zeus a hand rests, apparently of a suppliant; the figure is lost, but on the band below is inscribed *Θέτις Ἀχιλλεύς μίτρη*. The seated gods are like some early prototype of the seated gods of the Parthenon, and the resemblance naturally struck the discoverers at first sight, but these archaic divinities are much livelier and keener in gesture; they have not yet attained the well-bred composure of the Parthenon Olympians.

On the north side, that facing the Sacred Way, a gigantomachia is depicted, and from this composition come some of the finest motives in the whole frieze. Fortunately here, too, inscriptions abound, and it is hoped some incidental light may be thrown on the still problematic

figures of the Pergamene altar. Athene and Enkelados, Cybele and her lions, Dionysos with his kantharos helmet, Herakles with his lionskin, need no inscriptions. One group, but that it is inscribed, might well have baffled interpretation. A bearded man, wearing a short chiton, stands close to a large pithos, over it seems to place his open hand; with the other hand he is apparently closing a sort of leathern bag. An inscription tells us that he is Æolus, who appears here, for the first time we believe, in Archaic sculpture. The pithos is probably the main store-house of the wind, from which, from time to time, the bag is filled as wanted. In the *Odyssey* (x., i.) we have no mention of a pithos, but Odysseus says "he gave me a wallet made of the hide of an ox nine seasons old, which he let flay, and therein he bound the ways of all the noisy winds." The pithos may stand as shorthand for the island "surrounded by the wall of bronze unbroken."

About the question as to what school gave birth to these curious and sometimes beautiful Siphnian sculptures, controversy has already commenced. We have no evidence that a school of sculpture ever existed on the island itself. Herodotus tells us that the Siphnians possessed a market and a prytaneion of Parian marble, and the frieze is of that material. The architectural decorations of the building are archaic Ionian, but the style of the sculptures is not wholly what we associate with Asia Minor. Dr. Furtwängler does not hesitate to attribute the Siphnian sculptures to a Parian artist. M. Homolle inclines to see in them Argive influence, and he rests his argument, in part, on the evidence of epigraphy. On the shield of one of the giants an inscription occurs with the Argive lambda. The heavy proportions of the figures seem to point to Peloponnesian tradition, the choice of subjects, *e. g.*, the contest of Pelops and Oinomaos; and the prominence given to Menelaos may look the same way, but the question must await the full publication of the sculptures.

Immediately after the Treasury of the Siphnians Pausanias mentions statues set up by the inhabitants of Lipara after a naval victory over the Tyrrhenians. The site of these is not marked on the plan, but just at this spot an inscription has been found belonging to a votive offering from Lipara (*Bull. de Cor.*, c. xvii., p. 614).

So far the Sacred Way has run steadily at a moderate incline in a direction almost due west. It now turns at right-angles to the north, and climbs upward by a series of steep steps for about 13 metres, and there meets the elevated terrace of the Treasury of the Athenians, our present goal. Just opposite where the road turns, and on its left side, we come to another building, the Treasury of the Boeotians.

At this point Pausanias becomes topographically somewhat vague. Immediately after the Lipara monument he says, but with no topographical indication, that "the Theban Treasuries resulted from the victory of Leuctra as the Athenian from the battle of Marathon." He then goes on to mention the Treasuries of Syracuse and Potidaia, and the circumstances of their founding; these two last have not, so far, come to light. Fortunately, as to the Boeotian Treasury there is no doubt. A number of blocks were found covered with inscriptions, some dealing with the whole people of Boeotia, others with individual Thebans, also a decree about a boundary between two Boeotian towns. It is true these blocks were found not *in situ*, but a good deal farther down, south of the wall marked "Helleniko" in the garden of a modern house, but M. Homolle has no doubt that they belong to this spot. The Treasury of the Boeotians is built of bluish limestone in the form of a Doric temple. It stands on a foundation of tufa blocks, which, like those of the Sikyonian Treasury, seem to have come from another earlier building, and, to judge from the mason's marks, of the same date. The whole building has suffered much, and though its ground-plan can be made out, only the remains of the south side are now actually *in situ*.

The last of the Treasuries to which we came is perhaps first in importance, *i. e.*, the Treasury of the Athenians. Its claim to special attention is a double one. In the first place, its date is secure; we know, both from literary tradition and the evidence of inscriptions, that it was built to commemorate the battle of Marathon. Its sculptures and its architecture, therefore, furnish a fixed point, a standard by which we may help to date other monuments whose chronology has so far been problematic. Secondly, both the architecture and the sculptural decorations are of a fineness and finish of execution so far unique. The architecture of the building can be completely restored, and many of the metopes are marvellously well preserved. With the exception of the lowest step, which is of the reddish calcareous stone employed in the Athenian Stoa, the whole building is of Parian marble, the metopes of a fine quality, the triglyphs of a bluish, somewhat coarser, stone. The sculptures of this Treasury are, for the present, kept apart in a basement room of the temporary house where the French excavators live. At the first glance we feel as though we were looking at a series of Theseus and Herakles vases of the finest period directly rendered into marble; the same types, the same careful, delicate detail. One façade was devoted to the labors of Theseus, six in number, the other to those of Herakles. The sides were decorated with combats of Amazons, a Geryoneia, and possibly a Gigantomachia, but these are less well preserved and at present of uncertain disposition. One of the best of the series is a bending figure of Herakles with lion skin knotted about his neck; in the field are his bow and arrows with a piece of drapery, figured exactly as these recur again and again on red-figured vases, a bull and an Athene and Theseus standing opposite each other, the hero apparently awaiting the orders of the goddess. The contests with Periphetes, Sinis, Kerkyon, and the Minotaur

have also been made out. Of the pediment sculptures nothing so far has been discovered. Two figures in the round of mounted horsemen and Amazons which at first were believed to belong to the pediments are now attributed to akroteria. Some twenty or thirty years later than the Siphnian sculpture, and of much greater delicacy and finish, the metopes of the Treasury have still a slight savor of archaism about them. As to closer relations with other known sculptures it may be better to await the full publication of the metopes.

On the north side of the Sacred Way, exactly at the corner where it turns sharply north, a quadrangular building is marked on the plan, to which M. Homolle gives no name. He conjectures that it may be the Bouleuterion. M. Pomtow, on the other hand, would see in it the Treasury of the Cnidians, which Pausanias mentions in one breath with, and must have seen at the same moment as, the Treasuries of the Boeotians and the Athenians. Further excavations may settle this question, and may also yield to us the Treasury of Potidaia.

We have reached our goal with the Treasury of the Athenians; the plan for the present extends no further. After this last Treasury the road branches out into side ways east and west, and topography is likely to become more complex. With the issue of the next section of the plan we hope to continue our account. To describe the further monuments we saw on the spot without a plan would only be confusing. The great centre of interest—and, we may add, of disappointment, for not a fragment of its sculptures has come to light—the Temple of Apollo, still remains for discussion. We only add that close to its foundations have been found not only new fragments of the famous musical hymn, but also a beautiful statue of Antinous, one of the finest sculptured monuments that the excavations have yielded. How much yet remains unexplored is best realized by reading ahead in the account of Pausanias.

One lesser matter we hope will not escape attention, *i. e.*, the complete exploration of the Fountain of Castalia, at which every traveler stops to drink. There, as Dr. Dörpfeld pointed out on the spot, clear indications still remain that an extensive well-house once existed, analogous in its general plan and arrangement to the Enneakronnos of Peisistratos that he claims to have re-found for us at Athens.

Archæologists from all Europe met this spring to do honor to the excavators of Olympia; we may hope that before another year is past a like tribute will be paid at Delphi.—*The Builder*.

BOSTON PUBLIC LIBRARY.

IT is interesting to discover how fruitful and seemingly inexhaustible a topic for newspaper discussion is the new library building in Boston and with what astuteness writers seize upon little points as a text for conveying interesting, if not particularly useful, information. For instance, some one points out that a gross piece of archæological illiteracy has been manifested by placing upon the head of Pallas, that forms the ornamental keystone of the arch over the middle one of the three eastern doorways, the helmet that belongs to the warlike Latin Minerva, whereas the headpiece of the Grecian goddess of wisdom—proper *custos* of libraries—should be ornamented with figures of centaurs and sphinxes.

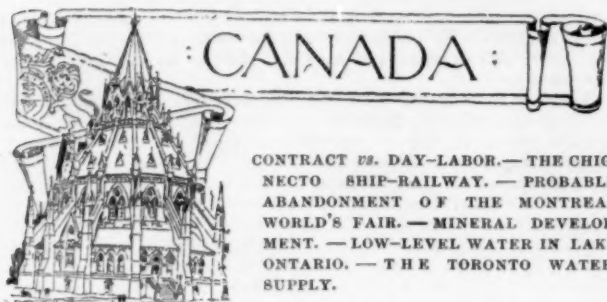
Quite in keeping with this was the copious flood of mythological lore that was poured out when it was made known that Mr. McKim had presented to the Library the graceful but nude figure of a bacchante by MacMonnies, which eventually will make the courtyard one of the most frequented spots about the building. The vigor of the attack by those of prudish inclinations and the citations they made from classic authorities was only equalled by the quickness with which the defenders discovered other citations and upheld the modesty and virtue of the priestesses of Bacchus. In this case, as in that of the *putti* on the front of the building, we, while not sharing in any way the prejudice against the nude in art, feel that since there are very many respectable people who prefer that their art works should present the skill of the human tailor rather than that of the Creator, it is a mistake in the case of a public building to please one portion of the public at the expense of another.

From one point-of-view we are very glad that the "Bacchante" is to find a place at the Library, since it will show that MacMonnies is capable of doing better work than is represented by the sketchy and theatrical figure of Sir Harry Vane, which at present stands somewhat disconsolately in an upper room of the special library floor and is apparently wondering why any one ever thought of placing his bulk indoors.

It is plain that the sculptured attributes that are already being prepared for the building are to be worthy of it and of the mural decoration already in place. It seems, however, somewhat regrettable that Mr. French is to expend his efforts on bronze doors rather than upon something less elusive and illusory. The labor and skill consumed in producing bronze doors is in large measure waste effort, since to be appreciated bronze doors need to be closed, and a library with closed doors is hardly a profitable institution. As the doorways are hardly wide enough to allow the construction of a *guichet* in one valve of each door, these bronze doors of French's must, save on holidays, stand open, and his work must be seen imperfectly by the aid of internal or reflected light without the aid and accent of direct cast shadows. Moreover, people who wish to examine his work at their leisure can only do so under penalty of becoming nuisances through forming obstructions to free and unobstructed

passage through the doorways — and the chief use of doorways is to afford such passage and not to constitute an art gallery.

It is a great satisfaction to know that private enthusiasm and generosity has come to the aid of Art and has raised the \$15,000 needful to enable Mr. Sargent to complete his decoration of the upper staircase hall in fulfilment of his original scheme. It was so obvious that the money must be raised, that there is no particular reason for gratulation that the sum has been secured, but it must be a satisfaction to Mr. Sargent and all others interested, that it was secured with such ease and that so many individuals wished to contribute to it.



CONTRACT VS. DAY-LABOR.—THE CHIGNECTO SHIP-RAILWAY.—PROBABLE ABANDONMENT OF THE MONTREAL WORLD'S FAIR.—MINERAL DEVELOPMENT.—LOW-LEVEL WATER IN LAKE ONTARIO.—THE TORONTO WATER-SUPPLY.

THE question as to whether day-labor or contract is the more economical appears to have received a very decided answer in the experiences of the Canadian Federal Government. The point is being continually brought up in municipal councils, but in such cases, it is to be feared, the arguments *pro* or *con* are usually propounded by those more or less biased one way or the other, and a clear candid opinion as to the merits or demerits of either system can hardly be expected from city aldermen. The opinion of Parliamentary committees ought to be worth more: at any rate, both systems have been given fair trials in the last few years here, and the results are eminently in favor of contracts. The case of the Lachine bridges, which was recounted in the last Canadian letter, proved conclusively how easily the country may be defrauded, and up to almost any amount, by unscrupulous contractors. A legal precedent for the construction of the Lachine bridges was set some years ago by the plan pursued in the case of the Fort Francis locks. This costly and magnificent work was carried out by the Government, under its own inspectors, without contract, and the results were not satisfactory; but it was thought that in a city like Montreal, where labor was plentiful and wages moderate, better results must be obtained. However, as was shown in the former letter, the Government was doomed to bitter disappointment which was only aggravated by the police magistrate, Judge Desnoyers, refusing to commit the contractor for trial, although the evidence seemed clear enough as to the alleged frauds, but not, in his opinion, sufficient to warrant committal. The matter, however, is not at an end yet. Although the Government has failed in the criminal prosecution, a case for the return of overpayments is to be proceeded with. The country will hardly care to see any more of its great works carried out by day-labor. The experiment of the Toronto Council in having its new municipal buildings finished by day-labor is being watched with interest. This building was begun under contract, but only reached some twenty feet above the ground level, when the contractor was dismissed. Owing to certain difficulties in obtaining satisfactory tenders for the completion of the works, it was decided to proceed with them by day-labor.

Mr. Provand, M. P. for the Blackfriars Division of Glasgow, the managing director of the Chignecto Marine Railway Company, has been in Canada interviewing the Government, and requesting for this Company an extension of time for completion of the works at Chignecto by two years. About three and a half millions have been already expended on the works, and about a million and a half more are required. The amount has been subscribed by shareholders, and it is claimed that the work could be completed in the time asked for. The Canadian Government guaranteed a subsidy of \$170,000 a year, for twenty years after the completion of the works, the period of construction being limited in the Charter granted to the Company. Mr. Provand stated that it was through no fault of the Company that the work was not completed within the time specified. It was the fault of the contractor, who was largely interested in contracts in the Argentine Republic at the time of the suspension of Baring Bros., which caused his failure and the stoppage of the works. The engineer of the Company, together with Mr. Provand, visited Canada last year, with the same object in view, and interviewed the premier, the late Sir John Thompson, but, so far as is known, did not obtain any definite promise from him. Whether Mr. Provand has been successful this time or not is still uncertain, but a contention has arisen over the interpretation of the expression "efficient working" of the railway, which occurs in the agreement referring to the granting of the subsidy. The Company interprets the words to mean simply having the railway completed and ready for traffic. The other interpretation is that the road should be actually handling a reasonable amount of traffic, and it is said that if the Company desires the extension of time, it will have to show that it

is carrying a minimum amount of traffic, which is put down at a million tons of shipping, annually. Mr. Provand has, in the meantime, gone home, and it is possible some time will elapse before anything is settled.

The Montreal World's Fair promoters have received a disheartening blow from the Dominion Government, which is unable to comply with the request of a deputation for the grant of a quarter million of dollars towards their project. Retrenchment being the order of the day, an undertaking, not an absolute necessity to the country, would not be likely to receive a grant at this time. It is probable that an "Exhibition" will be held, but only on a small scale, and it will be only of a provincial character.

The annual statistical table of the mineral production of the Dominion has recently been issued by the Geological Survey Department, and contains particulars of the entire production of Canadian mines for the year 1894. The document is exceedingly interesting, as showing the progress made in the increased mineral output of every kind. Nine years ago the total value of the mineral output was twelve million dollars, while last year it reached within one hundred thousand of twenty million dollars. These figures will appear small in the eyes of those accustomed to the returns of well-developed mineral districts, but it must be remembered that mining in Canada is comparatively a new thing, and although rich in almost every mineral deposit, little has yet been done in the way of development. Hitherto, our vast mineral resources have been somewhat mystical to the outsider, but, by a gradual process, we are proving that our underground riches are not an empty boast. With a population of only five million in so vast a territory, the lack of necessary capital is not surprising, but the confidence of outside capitalists is annually increasing, and each year we may expect to see great strides made in mineral development. In the important matter of gold mining, we got very near the million mark, the actual value being \$954,451; of nickel the value raised was \$2,061,120, and of silver \$409,239; copper stands at \$805,760, and iron ore at \$226,611, of which 108,871 tons were converted into pig-iron, producing pigs valued at the furnaces at \$646,447. The total metallic output is given as valued at \$4,683,389. The non-metallic products, which foot up to nearly sixteen millions of dollars, include bricks, building-stone, petroleum, gypsum, mica and a great variety of other materials.

The inhabitants on the shores of Lake Ontario are all asking "What has become of the water?" or "Where is the water going to?" for despite all the snow of last winter and the usual amount of spring rain, the level of the water has been getting lower and lower and is now some two feet lower than last spring. The snow and rain seemed to have no effect upon it. Scientists have tried to explain that high levels and low levels of the Lakes run in cycles, but that does not convey much comfort to the citizens of Toronto who find their water-supply in danger of being decreased. They have just refused, by a large majority, to permit the City Council to expend a big sum in the carrying out of its engineer's programme of constructing a tunnel under the bay and through the island that separates Toronto from the Lake. Not that the tunnel could be constructed and the supply made sure in time to save them from the calamity they think they see before them this year, but who can say what trick the water of the Lake may play another season. The Council had ideas of its own, and in its wisdom saw fit to couple some unpopular suggestions of expenditure with the item for the water-works, thinking that the latter was sure to pass and would drag the other through with it. The tunnel by-law, however, did not pass. It was proposed to put in new mains on the principal streets of the city; to improve the fire-pressure at a cost of \$226,000; a new steel intake-pipe, to replace a portion of the present supply-pipe which runs through the island and is of wood, to cost \$75,000; and the tunnel across the bay, at the price of \$450,000: total, \$751,000. To quiet-minded people, like the inhabitants of Toronto, the amounts are alarming, but it is difficult to see how the ends required could be attained in any other way, and attained they must be. They have spent years in growling and tinkering at the supply-arrangements, thousands and thousands have been expended on ill-conceived and worse-executed schemes, but the Council has itself only to blame for the recent defeat of the great remedial measure. Some people seem to be satisfied with the fact that a great improvement has been made in the quality of the water supplied during the last two years, regardless of the cause, which was a result of repairing the present conduits, which in a few years will give out entirely and may at any moment require more repairs. In recounting the circumstance, it should be borne in mind that the electors entitled to vote on money by-laws only represent a small proportion of the water-drinking population, and that only four thousand out of nearly two hundred thousand actually voted.

At the time of closing this letter, news is received from Montreal that the case against St. Louis, referred to at the beginning, is at an end. The Grand Jury threw out the bill. Mr. St. Louis has been very much sympathized with by a large proportion of those who followed the cases against him, for although no doubt existed of wrongful proceedings — claims for work in excess of that executed and for time never occupied — yet it was equally clearly shown that Mr. St. Louis was not entirely responsible, and it was that that caused the Judge at the first inquiry to refuse to send the case down for trial. Moreover, the defendant has been forced to pay heavy sums in his own defence.

ILLUSTRATIONS

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

DOORWAY TO BATES HALL: PUBLIC LIBRARY OF THE CITY OF BOSTON. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

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

NEW BRANCH BANK OF MONTREAL, NOTRE DAME ST., MONTREAL, CAN. MR. ANDREW T. TAYLOR, F. R. I. B. A., R. C. A., (OF MESSRS. TAYLOR & GORDON), ARCHITECT, MONTREAL, P. Q.

WING to the growth of the city it has been deemed expedient to establish branch banks in various parts of the city. The one represented has just been completed. The building is simple but picturesque, and is built of red Scotch sandstone. A large carved panel of the arms of the Bank fills the front gable. The ground story and basement are intended for banking purposes, the upper floors being for offices and caretaker's house. The banking-room is finished in old mahogany and antique brass with mosaic floor, and the ceiling and walls are somewhat elaborately decorated.

ST. MICHAEL OF CREECH ST. MICHAEL, NEAR TAUNTON, SOMERSETSHIRE, ENG. SKETCHED BY MR. A. B. BIBB, ARCHITECT.

NAVE OF ST. CUTHBERT'S, WELLS, ENG. SKETCHED BY MR. A. B. BIBB, ARCHITECT.

CHURCH AT DYNDER, ENG. SKETCHED BY MR. A. B. BIBB, ARCHITECT.

SEE article elsewhere in this issue on "English Country Churches."

TERRACE OF HOUSES FOR EUGENE R. KNAPP, ESQ., BROOKLINE, MASS. MR. A. H. DODD, ARCHITECT, BOSTON, MASS.

TULIP HILL, 1750, WEST RIVER, MD.

[Additional Illustrations in the International Edition.]

PUBLIC LIBRARY OF THE CITY OF BOSTON. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

DETAIL OF STAIRCASE HALL OF THE SAME.

[Gelatine Print.]

VESTIBULE AND STAIRCASE ARCH OF THE SAME.

[Gelatine Print.]

SECONDARY SCHOOLS AND TECHNICAL INSTITUTE, RICHMOND, FOR THE SURREY COUNTY COUNCIL, ENG. MESSRS. FRYER & BATH, ARCHITECTS, WESTMINSTER AND RICHMOND, ENG.

WE illustrate the selected design submitted under motto "*Labor et Spes*." Eleven sets of plans were sent in and adjudicated upon by the county surveyor. The selected plan was unanimously adopted by the Surrey County Council and the Richmond Technical Instruction Committee. The buildings will occupy a prominent site on the Kew Road at the corner of Selwyn Avenue. The plan provides for a large hall at the corner of Selwyn Avenue capable of accommodating 300 persons, behind which will be a class-room for dress-cutting, and provision for cookery classes, with a separate entrance for the women attending the classes; while a large corridor will separate this building from the hall, and so prevent any annoyance or disturbance to classes in the hall. This wing of the building, however, will not be erected at present, owing to lack of funds. The opposite wing will contain a class-room, 60' x 25', which will at present be used as a hall, and is divisible into three smaller rooms by means of movable partitions. In the main building on the ground-floor there will be two large class-rooms, several smaller rooms, and accommodation for the head master. Behind the large class-room will be a well-equipped chemical laboratory and balance-room. On the first floor is the art school, 40' x 25', with an art class-room adjoining and an art master's room attached. On the same floor are other class-rooms and the caretaker's apartments. There are large basements which will also be utilized. The building will be heated by hot-water radiators and boiler-room; ventilation will be specially provided for; and one of the best features in the plan is the admirable arrangement for lighting, especially in the art-rooms, where there are both windows and skylights.

Tenders have been invited for the erection of the buildings, the lowest being that of Mr. T. W. Brooking, of Richmond, for 6,868*l.*, which, with certain modifications, has been accepted by the Surrey County Council.

COMMUNICATIONS

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE COST OF BUILDINGS PER FOOT.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Some years ago I saw a very fine table in your paper giving the cost of different kinds of buildings both per square-foot of floor-space and by cubic contents of the building: the list had houses, stables, churches, business buildings, schools, etc. Will you please publish it again or one like it and greatly oblige,

W. H. B.

[Should we begin to republish the valuable and interesting papers that this journal has contained in the last twenty years, so many, overlooking the real usefulness of such a course, would be found willing to charge us with mere parsimony that it does not seem wise to comply with our correspondent's request. He will find tables relating to the cost of buildings in our issues for May 21, 1881; April 5, 1884; February 17, 1894; and April 7, 1894. EDS. AMERICAN ARCHITECT.]

THE ACTION OF IRON ON WOOD.

NEW ORLEANS, July 4, 1895.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—The remarks of Mr. Samuel Cabot, on the "Weathering of Nails" published in your paper of June 29, apply as well to a more important case, viz, the decaying of the feet of posts, etc., in contact with iron in damp places.

I have repeatedly found, where wooden posts stood on stone blocks, with a centre iron pin to keep them in place, that a large hole had rotted away from the pin, so large sometimes as to endanger the safety of the post.

This has induced me not only to avoid the use of iron pins in such places, but even to avoid using iron plates under posts in damp places; or if compelled to do so, to use tar or tarred felt or sheet copper between the two. Yours truly,

JAMES FRERET.

EXHIBITIONS

BOSTON, MASS.—*Summer Loan Exhibition; Gobelin Tapestries; Japanese Paintings; Line Engravings, Mezzotints, and Etchings by Rembrandt; at the Museum of Fine Arts.*

CHICAGO, ILL.—*Paintings by Manet; at the Art Institute.*

NEW YORK, N. Y.—*Twenty-eighth Semi-annual Exhibition; at the Metropolitan Museum of Art.*

Summer Charities Loan Exhibition; at the American Art Association Galleries.

NOTES & CLIPPINGS

LAST OF THE PHILADELPHIA CABLE-CARS.—A few days more will witness the ending of the cable-system as a means of passenger transportation in Philadelphia. Within a week every remaining cable-car on the Market Street main line, the last link in the cable system, will be displaced by the trolleys. The passing of the cable-cars marks a step in the progress of street-railway facilities in Philadelphia. When the system was introduced, it was looked upon as a solution of the problem of rapid transit, and on the strength of this opinion the Philadelphia Traction Company invested a fabulous sum, estimated to be in the neighborhood of \$8,000,000, in equipping the Market Street, Columbia Avenue, and Seventh and Ninth Street lines. But while they were an improvement over the jogging horse-cars, they by no means proved satisfactory, and it is with no regret that the cable-system has followed the horse-car line in giving place to the trolleys. The cost of construction of the cable-lines was enormous in comparison with the equipment of the trolley lines, the cost of operation was greater, and the service rendered was less efficient. As a consequence, the cable-cars have been forced out of service by the system which has demonstrated its superiority. The machinery at the power-stations, now lying useless and idle, represented to the Traction Company an immense amount of money, and it would appear on the surface to be a sheer waste of hundreds of thousands of dollars to dispose of all the gigantic driving-gear for a mere song to be broken up for scrap-iron. Yet it is useless for any other purpose, and the Traction Company has disposed of it all to a scrap-iron firm for the best bargain it could obtain—the great winding-drums, around which the greased cables passed, and the heavy driving machinery, weighing thousands of tons, all of which are to be converted into iron and steel junk. Of all the machinery in the immense plants, the engines and boilers are alone valuable above the price of old iron.—*Philadelphia Record.*

AN ALMSHOUSE INSCRIPTION.—In front of some almshouses at Leominster, England, there is the quaint stone figure of a man holding a hatchet in his hand, and underneath there is this inscription:—

He who gives his money before he is dead
May take up a hatchet and cut off his head.

The story current in the neighborhood says that the founder of these almshouses came to want through being involved in building expenses for them, and actually had to seek refuge within their walls as one of the inmates.—*Exchange.*

THE PULPIT IN THE CATHEDRAL OF PISA.—*Archivio Storico dell' Arte*, which, for want of subscribers, threatened to founder, has reappeared triumphantly with the first number of a new series containing several interesting articles and documents. The most important contribution is one by Signor Supino, who, after a careful study of various descriptions dating from the fifteenth century, comes to the conclusion that Giovanni Pisano's pulpit in the Cathedral of Pisa originally was supported on eleven columns, and only one sculptured group. The remaining groups, which, if they formed part of this pulpit, would, in truth, make it grossly over-elaborated, Signor Supino ingeniously proves, on both documentary and stylistic grounds, to have belonged to the tomb of the Emperor Henry VII, begun in 1315 by Giovanni Pisano's pupil, Tino di Camaino, and to have been added to the pulpit during the rearrangement of the Cathedral and its monuments that took place at the end of the fifteenth century.—*Philadelphia Telegraph.*

PLAN OF PARIS EXHIBITION.—It is decided, says our Paris correspondent, not in 1900 to cover the Seine with an iron bridge, extending from the Avenue Montaigne to the Place de la Concorde. The plan adopted is to turn the river into semblance of a grand canal at Venice. The principal entrance to the 1900 exhibition will be in the Cours la Reine, near the Place de la Concorde. The portal is to be flanked with two buildings devoted to education and technical instruction. The Fine Arts Palace will face the Esplanade of the Invalides and cover the Jardin de Paris. These buildings and a bridge over the Seine will be the only permanent constructions. The Venetian palaces on the river will be places of amusement. The bridge will take a slightly oblique course, and have but one arch, the span of which will be of steel. Between it and the Pont de l'Alma will stand the Palace of Flowers, and the Palace of Social Science and of Congresses. Foreign exhibitors will be given stands in pavilions and palaces in the Champ de Mars, where the agricultural show is also to be held. A Château d'Eau with cascades is to serve as vestibule to a Palace of Electricity bordering the Avenue de Suffren.—*London Daily News.*

LOG RAFTS ON THE PACIFIC OCEAN.—Despite previous failures, Pacific coast lumbermen are still trying to raft logs in the Pacific Ocean. It is stated that a raft is now nearing completion at Stella, Wash., which will be started down the Columbia River en route to the sea about the middle of June, when the favorable weather, common to that period, is expected to permit the enterprise to terminate successfully. The raft will contain 400,000 lineal feet, or 6,000,000 feet board-measure. It will be 525 feet in length, 52 feet wide, 30 feet in depth, and will draw between 20 and 21 feet of water. The two previous experiments with log rafts, costing about \$40,000, were failures, the rafts going to pieces before they had fairly cleared the mouth of the Columbia River, and their floating *débris* proved a menace to shipping, and, if the present experiment does not succeed, steps will probably be taken to prevent repetition. Could logs be rafted to mills down the coast it would be a great thing, but the chances are so great against the plan that it will probably never be a common method of log transportation on the Pacific coast. Similar attempts have been made on the Atlantic coast. Even the partial success of the second experiment at rafting logs on the coast of New Brunswick for transport to New York was not so marked as to induce lumbermen or capitalists to adopt the log raft as a common mode of transportation.—*Northeastern Lumberman.*

LONDON'S PNEUMATIC SYSTEM.—Telegraphing over short distances—as within towns, for instance—is a very costly operation. It requires the same number of operators—one at each end—and the same number of instruments as for the longest distances. But compressed air will blow a telegraph-form through a metal tube as far as two or three miles in as many minutes; and steam engines are used to compress the air by means of which the pneumatic tubes are worked. The engine-room at the central office resembles nothing so much as the engine-room of a great steamship, except that the engines are on the "beam" principle, as being best suited to the peculiar work in which they are engaged. They are magnificent specimens of the engineer's craft, and have a stately appearance, due, in large measure, to their leisurely stroke as compared with the hurried action of the marine or electric-light engine. Night and day these engines are employed in pumping air into, or exhausting it out of, huge "containers," which are connected with the tube-room overhead. There are no fewer than thirty-six pneumatic tubes radiating throughout the metropolis, buried under the pavement among the gas and water pipes, and every now and then crossing the path of the telegraph wire, whose handmaids they are. It is desired, say, to send a message from St. Martin's-le-Grand to Charing Cross. Here is a tube-like felt-covered box which will contain one or a dozen message-forms at pleasure. Place the form inside; secure the open end of the box, or "carrier," as it is called, by means of an elastic band; insert the box in the mouth of the tube; admit the compressed air, and away it goes across Newgate Street, along Paternoster Row, down Ludgate Hill, up Fleet Street, and along the Strand, where, at No. 448, it projects itself under the nose of the attendant

with a thud and a rebound, in almost shorter time than it takes to describe the operation. All the air is stored at the central office, so that if it be desired to reverse the operation—i. e., to send a message from the West End to the City—it is only necessary to transmit an electric signal, when vacuum is turned on, and the "carrier" is sucked back which a minute before had been blown out. The tubes are, in fact, gigantic pea-shooters. What may be called the working-gear of the tubes is in itself a most interesting sight. It has been mostly designed by officials of the Telegraph Department, and is unique of its kind. Indeed, the whole pneumatic system of the central office is an "exhibit" of the most interesting kind, and an object of just pride with those who have it in charge.—*The Gentleman's Magazine.*

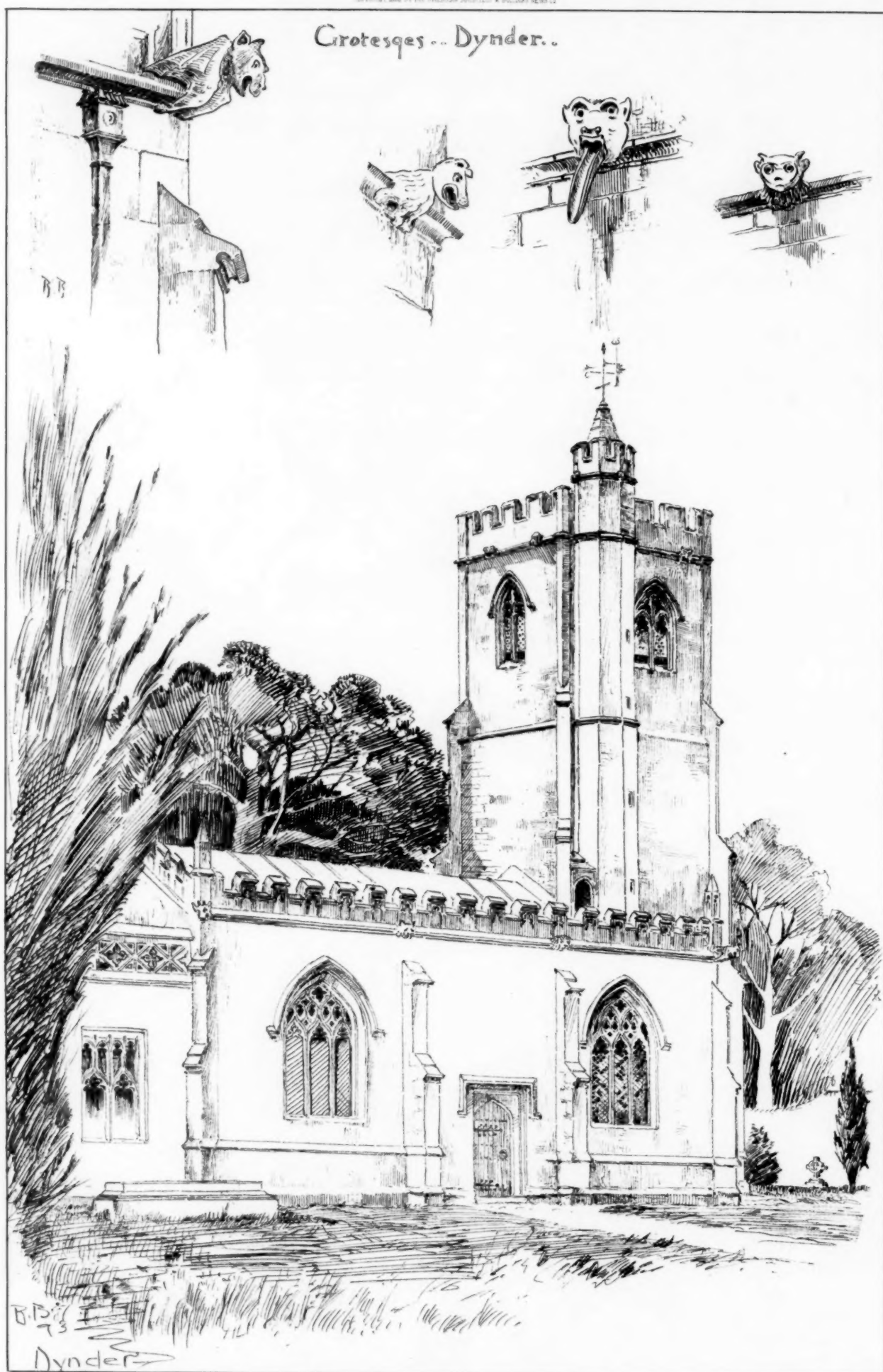
THE STORY OF MERCIÉ'S "GLORIA VICTIS." It is not generally known that the famous group, "Gloria Victis," by the French sculptor, Mercié, was inspired by the late M. Thiers. In November, 1870, Mercié occupied the place in the Villa Medici in Rome, which was made vacant by the death of the winner of the First Prize in sculpture. Like all French patriots, he was shocked and grieved beyond measure over the disasters of France. As an artist, too, he was hurt by the unexpected turn of affairs, because immediately after the declaration of war he began to make a statue of Victory to commemorate the triumphs of the French arms. Very soon the work became not only useless, but impossible. Mercié was in gloom and grief over what he considered the complete loss of his statue, when Thiers, in his tour through the capitals of Europe, in the effort to gather up a little sympathy for France, arrived one morning in Rome. Mercié obtained an interview with him, spoke of his defeated country and of his own future now forever compromised. Thiers, notwithstanding his graver preoccupations at that moment, still remained the friend of artists and the connoisseur that he always was. He promised to look at Mercié's work at the Villa Medici, and he kept the promise. In presence of the winged statue of Victory, which was made to symbolize the French triumphs that the artist had hoped for, Thiers stood in mute admiration; but when Mercié remarked, sadly, that one of two things only remained for him to do, either to destroy the figure or to hide it, he looked sternly at the sculptor and said, "Neither one nor the other. Glory does not belong to victory alone. Keep your statue, but, instead of having it holding up crowns and trophies, make it glorify the heroism of a dying soldier. Then it will not be a victory; it will stand for Gloria Victis!" "Ah!" cried Mercié with tears in his eyes, "May you save France as you have saved me!"—*Philadelphia Record.*

THE DANGERS FROM USING INCANDESCENT LAMPS.—A fire-insurance paper calls attention to the danger of fire from the incandescent-lamp globe in store windows, through the ignorance of the window-trimmer. Desirous of making as light and fluffy a display as possible, he winds loose and highly inflammable material around the butts of his lamps, and occasionally is bold enough to envelop the bulb itself with tulle, canton-flannel, cotton-lace, or similar light material. In notion houses, a celluloid comb is often placed where the light will show it off best to the outside spectator, regardless of the danger of ignition, or a semi-transparent sheet of like material will be adjusted close to a lamp, at the imminent risk of putting the whole window in a blaze. It should be clearly understood that incandescent lamps throw off sufficient heat to start fires under anything like favorable conditions. Not long ago a fire broke out in a Boston dry-goods store through an incandescent lamp being allowed to remain for a few moments on a pile of cotton cloth in the packing-room. The person in charge left the room for a short time, having, as he said, "the idea that the electric lamp couldn't set fire to anything," and when he returned the cloth was blazing. Another fire broke out while a window-dresser was preparing a Christmas snow scene. The incandescent lamps in the window had not been changed for a year, except when there had been breakages. The carbon in an incandescent globe has a life of 600 hours, and as the filament wears out increasingly more heat is thrown off upon the glass bulb, and even upon the metal fittings. The dresser was filling the floor of the window with loose cotton upon cheesecloth to represent snow. This was packed closely around the stems and globes of the electric lights, and the inflammable cotton, coming in contact with the burning-hot glass and metal, caused a fire.—*N. Y. Times.*

AN INGENIOUS METHOD OF RAISING WATER.—"One of the most interesting and ingenious methods of raising water from a river I saw recently on a visit to Green River," said Assistant Engineer Gilcrest. "It was a contrivance arranged by Charles McPherson at that place. It consists of a wooden wheel two and a half feet in diameter, and armed with paddles, which were set in motion by the current of the river, into which it was placed between two old scows. At one point in the circumference of the wheel is an offset with an opening in it. As the wheel revolves, the water is forced through the opening into a coil of pipe in the body of the wheel, which is arranged like a snail's shell. This coil terminates in the axle of the wheel, which consists of a gas-pipe two and a half inches in diameter. A perpendicular standpipe rises from this axle five and a half feet above the centre of the wheel, and through this pipe the water is forced in a continuous stream. All of the work on the wheel is rough-and-ready, but the principle of the thing was new to me. The maker of the wheel told me that a wheel eight feet in diameter would raise water through a two-and-a-half-inch pipe to a height of twenty feet. The height to which it is raised depends upon the number of coils in the interior of the wheel. The wheel I saw was covered with Russian-iron sheeting, so as to make it air-tight, except for the opening at the offset, and I suppose that compressed air has much to do with forcing the water so far above the surface. A good feature of the wheel is that it need not be permanently fixed anywhere. It is set between two scows, and therefore rises and falls with the current. It was well worth while going a good distance to see it work."—*Cheyenne (Wyoming) Leader.*

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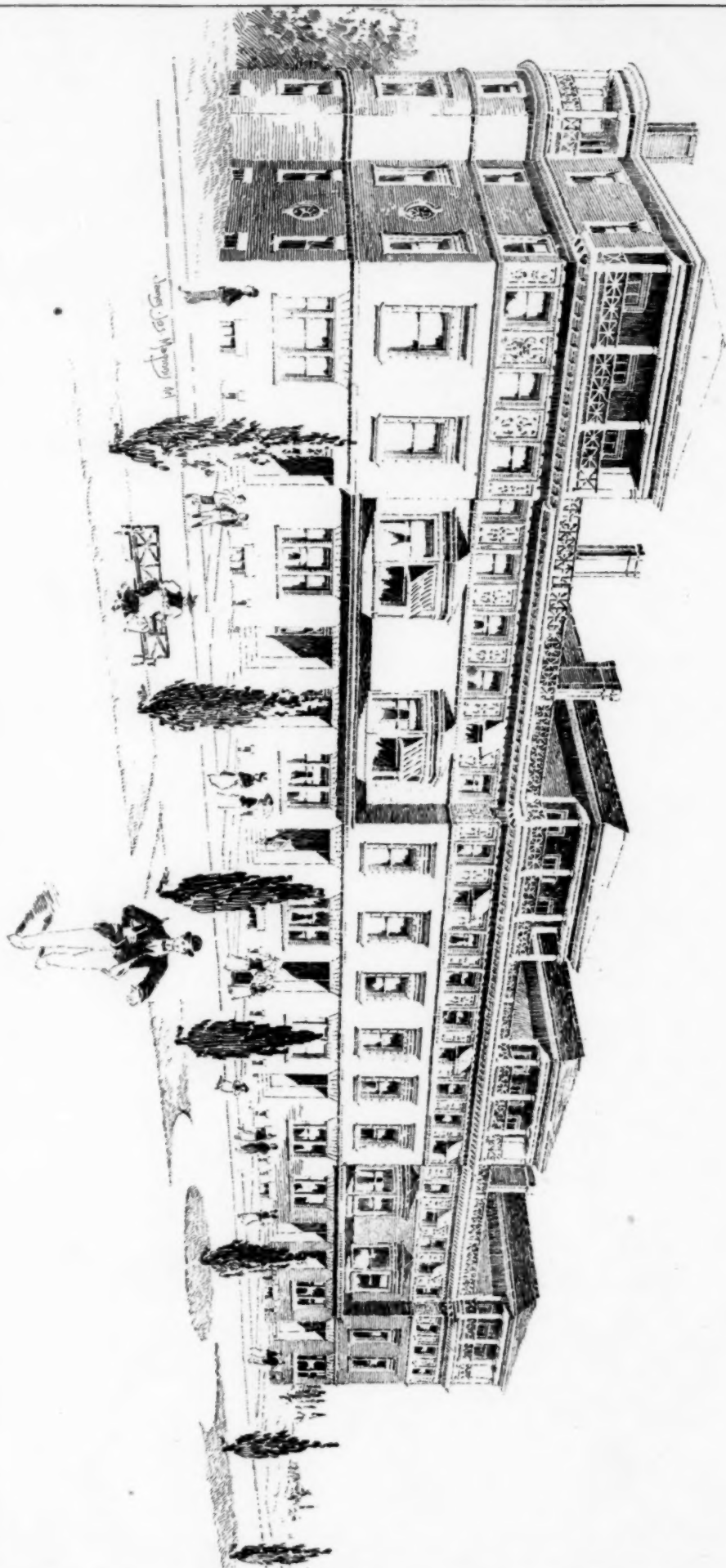




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Nave of St. Gilbert's, Wells, Eng.

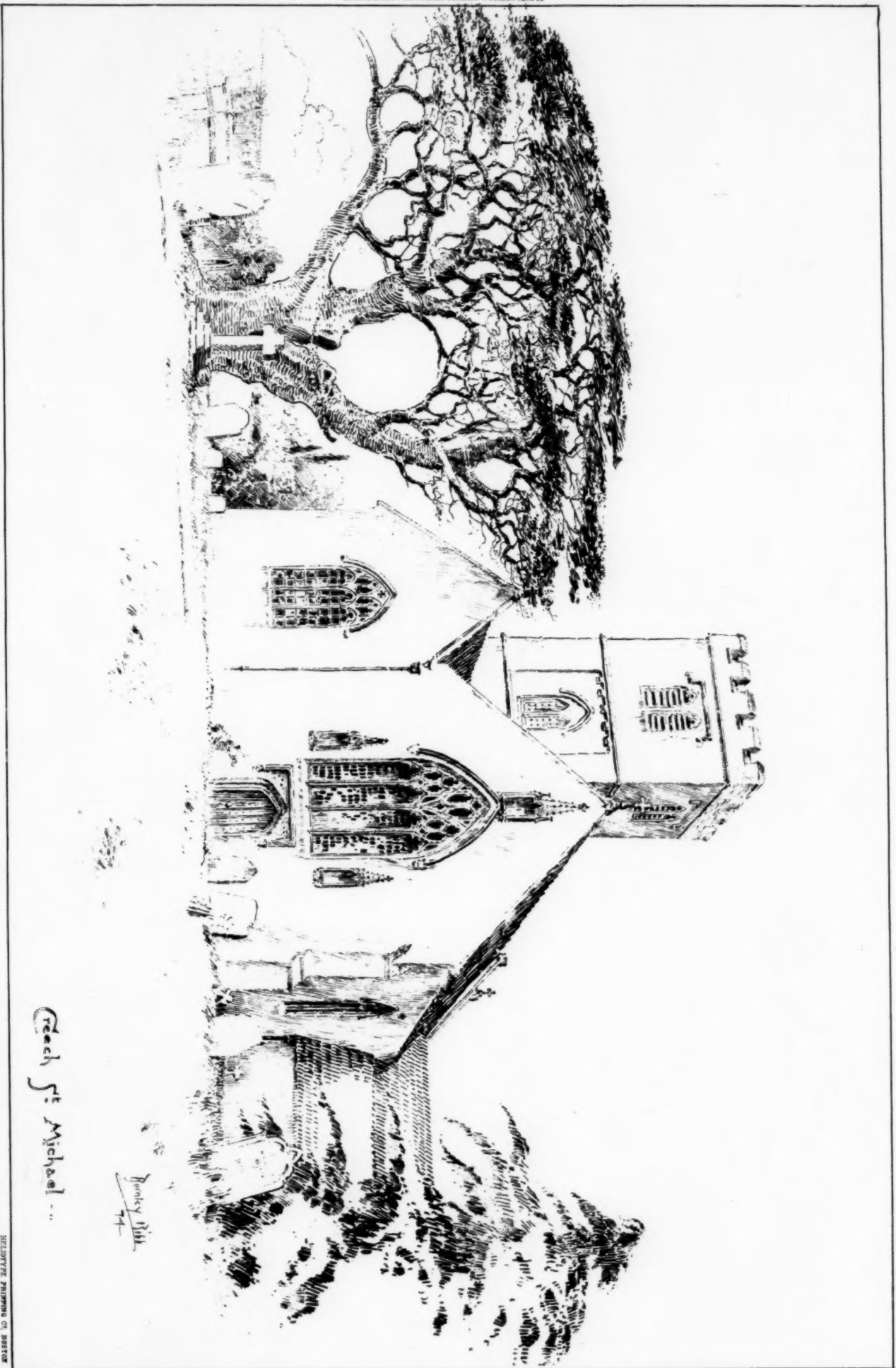
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TERRACE OF HOUSES FOR EUGENE R. KNAPP, ESQ., BROOKLINE, MASS.

ARTHUR H. DODD, Architect.

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Church of St. Michael...

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VILLAGE HILL, 1750
WEST RIVER, MARYLAND

