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ENGINEERING

DECORATION

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CONSTRUCTION

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VOL. XL.

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JUNE 3, 1893.



SUMMARY:—

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THE complete Report of the Commission appointed by the London *Lancet* to examine the water-supply of Chicago is a very interesting document. Although the usual British ignorance of American geography is curiously illustrated by the statement, made in more than one place in the Report, that the sewage of Chicago is mostly discharged by pumping "into the Missouri, and eventually into the Mississippi River," the proceedings of the Commission show no lack of intelligence, while they were evidently carried on with true Britanic conscientiousness. It is hardly necessary to say that no Englishman would be satisfied with having the water which he expected to drink analyzed anywhere but in London, and the duties of the Commission were confined to gathering samples of water, to be sealed up in sterilized bottles brought from England for the purpose, and returned to the London analysts. Incidentally, however, the Commission made observations in regard to the perfume of the Chicago River, and the "foolish and most mischievous practice" of putting ice into drinking-water, some of which are well worth remembering. In general, the analyses showed that the Lake water, notwithstanding the inviting process by which the slaughter-house refuse and other sediment is regularly dredged out of the river and deposited in the Lake, is of remarkable purity. The *Lancet* pronounces it, even at the dumping grounds, superior in quality, so far as dissolved impurities are concerned, to the average London water-supply, and frankly congratulates the city on the possession of "an illimitable water-supply, which needs nothing but good management to render it all that could be desired." At present, however, owing to the danger that vast masses of specific disease-germs may be at any time carried by the dredging from the river and disseminated through the Lake, the *Lancet* thinks it essential that the Lake water should be filtered before it is used for drinking. The so-called "Chamberland-Pasteur" filter, in which the water passes through a thin septum of unglazed porcelain, is, it says, much used in Chicago, and, if properly taken care of, is very efficient, microscopic investigation having proved that no known disease-germ can pass through its pores. A public filtration of the water-supply would be desirable, but no arrangement for this has been made, or could be made soon enough for use this summer, so that dependence must be placed on private appliances. It would further advise the boiling of drinking-water, but, as this renders the water insipid, it will be necessary to let it stand

some time after boiling to absorb air. All these precautions, however, as it points out, will be useless if the practice is permitted which, it is informed, is common all over the United States, of putting ice into the water. Some of the samples sent to London for analysis were specimens of drinking-water as supplied at the hotels, and, although the water had been filtered, were found contaminated in a way which would be very dangerous if an epidemic of zymotic disease existed in or near the city, simply through having been cooled by putting polluted ice into them.

TO Eastern people, who remember the extensive and fatal epidemic at Lynn some years ago, which was traced directly to the use of ice from a pond contaminated with sewage, the danger of bad ice is familiar, and consumers usually demand that they shall be supplied from an unpolluted source; but, in other places, pure ice may not be so much in demand or so easy to get, and the *Lancet's* warning should be remembered by our own people, as well as by those for whom it was intended. As to the value of the *Lancet's* remedy, however, we are not quite so clear in mind. It says that the "simple and obvious" practice of using two receptacles — the outer one for the ice and the inner one for the water to be cooled — is alone to be approved; but the experienced American ice-water drinker, who has had many a draught of turbid, stagnant water from such "inner receptacles," will not be entirely disposed to agree with this recommendation. Of course, pure ice is essential, but, if pure ice can be had, the American who has suffered all day in the July sun is very apt, on getting home in the evening, to call for a glass of water and a lump of ice, stir them together and swallow the liquid portion as rapidly as possible, without waiting for the slow process of cooling the water by application of the ice to the outside of the tumbler. Moreover, whatever Englishmen may say, there is a refreshing coldness to water sucked between a tumblerful of lumps of ice which a fluid cooled from the outside, unless, indeed, it is actually frozen, as it sometimes is in our hotels, does not possess, and which it would not be pleasant to give up. If we had our own choice, we would insist on our ice being made artificially out of distilled water, and this material, chopped into sparkling lumps, we would, in hot weather, put liberally into our tumblers of pure spring-water. The mention of spring-water reminds us that the *Lancet* Commission examined the principal spring-waters sold in Chicago, as well as the Lake water. The water from the two springs at Waukesha, Wis., the Hygeia and the Silurian, was found to be very free from organic matter, but rather rich in nitrates. The Hygeia water contained free ammonia, but almost no "albuminoid ammonia," while the Silurian showed no trace of ammonia of any kind. The presence of nitrates indicates that the products of the complete decomposition of organic matter found their way into the springs, but in an innocuous form. The water from the Washington Heights artesian-well, which is also extensively used, was found to contain nitrates, nitrites, ammonia and chlorine, indicating that organic matter, after thorough decomposition and aëration, found its way to the well, and, although the water showed no distinct organic pollution, the *Lancet* suggests that a sharp watch should be kept on the gathering-ground of the well, lest matter not so far decomposed as to be harmless should succeed in reaching the water.

OUR attention is called to the fact that the crusade in favor of better roads, which Colonel Pope, of Boston, has led with so much zeal, is beginning to bear fruit. As in the case of so many other reforms, it was only necessary to show the persons affected how much they had to gain by more scientific and rational treatment of the problem to make them earnest supporters of the movement, and it seems likely that another generation will see some approach to a great system of State or National roads, much to the advantage of the people, particularly those who live in the remoter country districts. So much has been said about the vast saving of time and money which decent roads would make to farmers and others who depend upon them for transportation that we need add nothing on that point; but something might be said in

regard to the moral and social influence of convenient transportation upon that larger and better portion of our population which lives away from paved and macadamized streets. One of the most interesting characteristics of our age and country is the universal sympathy which prevails in regard to nearly all subjects of thought. Although a critical observer can discern faint local differences of habit, there is, in this country, absolutely nothing of the clannish exclusiveness which prevails, for example, between the Italian cities, or the German States, or even the different parts of the United Kingdom. With us, a book or magazine which is read in New York is found in the circulating-libraries of every city in the Union, and the clientele of *St. Nicholas* or the *Youth's Companion* extends from Maine to the Mexican border. It is not surprising that the unity of thought which has, of late years, abolished every sort of section-line should lead to a great development of physical intercommunication, and it is notorious that the average American does more travelling than the average citizen of any other country in the world. Hitherto, however, travelling, even among Americans, has been mainly confined to those who live within short distances of the railways. However anxious a resident of the Virginian Wilderness, or the Texas plains, or the Tennessee mountains, may be to exchange visits with his friends in New England, or gain and impart ideas in the places where thought is more current than at home, he is kept at home by an insurmountable obstacle—the roads. To this day, in the larger portion of some of our oldest States—States which have produced the noblest thought and purest patriotism that have honored our Republic—there is practically no communication except by bridle-path. We remember, in one of the oldest towns in Virginia, trying to hire a carriage to take us for a drive on the principal county road. After a long search a vehicle was found, dating, apparently, from the Revolutionary period, to which was attached, by a miscellaneous harness, a horse of the usual Southern pattern. A few miles on the road were sufficient to show why carriages were rare in that region. Not only did the highway lead through long stretches of red mud, but it occasionally plunged boldly into streams, as to the depth or swiftness of which no conjecture could be formed from the surface indications. Where the gentle excitement incident to a dive into the water, with, apparently, a doubtful prospect of emerging safely on the other side, was lacking, its place was supplied, in the hilly parts of the way, by a singular construction, consisting of a low retaining-wall, built longitudinally through the middle of the road, and dividing it into two terraces, one some inches higher than the other. The purpose of this piece of engineering was evidently to check the water flowing down the hill, and keeping it from washing gullies across the road, and, as applied to a bridle-path, one could see its utility, but, as a construction for a carriage-road, its effect, as the whole highway measured only about seven feet in width, was to keep the wheels on one side from six inches to a foot above those on the other side, imposing a delicacy of equilibrium which had little charm for people accustomed to macadamized streets.

It is hardly necessary to say that such thoroughfares as this are almost perfectly useless for the more extensive communication which is the great social and commercial demand of the day. Our great-grandfathers could go visiting on mules, with a saddle-bag on each side and our great-grandmothers holding on behind, but people now travel with trunks instead of saddle-bags, and our sisters and cousins and aunts, who live off the railroads, stay at home, rather than incur the mortification of travelling without the baggage which the city ladies consider indispensable, but which it is utterly impossible for them to have transported, perhaps forty or fifty miles, to the nearest station. It is a great mistake to think, as many people in the cities do, that these rough country roads are good enough for the nocturnal prowlings of the White Caps, or the saunterings of the "poor whites," whom they suppose to be the only inhabitants of the region dependent on them. While the vicious part of the population finds it very much for its interest to keep the country inaccessible, there is a large proportion of the better class, which would welcome decent communication with the rest of the world as a deliverance. At first, undoubtedly, the work of improvement will have to be undertaken either by the State or Federal Government. Farmers are not the only persons in this country who hate anything like an ex-

pert, or a scientific man, and any improvements over the ancient system of building roads out of undrained mud will have to be imposed upon the community by force, but the effects will be so soon apparent that probably nothing but the introduction will be necessary, and when once the more important highways are put in order, and the inhabitants of the surrounding region see their neighbors transporting three loads of produce to market where they formerly took one; bringing back two tons of fertilizer on the same wagon which formerly brought less than one; investing the money saved in this way in handsome carriages for their families, or in establishing stage-lines to cheapen and facilitate still further communication with the rest of the world, they will clamor for something of the kind for themselves, and, if no other way offers, will take to building their own roads, rather than be left behind. So far, the wish of the persons having this reform at heart seems to be to have instruction in road-building, and models for imitation, placed within reach of the community at the public expense, but, although this is, of course, desirable, and even necessary, we imagine that more energetic steps will have to be taken before much improvement can actually be accomplished.

THE three principal brick manufacturers of the region about Boston, the Bay State Brick Company, Messrs. Parry Brothers & Co., and Mr. M. W. Sands, have formed a combination, under the name of the Boston Consolidated Brick Company, to control the sale of brick in and near Boston. It is reported that the new company has already raised the price of brick from eight dollars to nine dollars per thousand, and contemplate a further advance. Under ordinary circumstances, more than a hundred million bricks are used in Boston during the season, and the addition of a hundred thousand dollars to the price will make a material difference in the profits of the manufacturers, as well as in those of the builders who have already signed their contracts for the season. The latter, naturally, are not pleased with the change, and, although it seems likely that they will have to pay the increased price for this season, owing to the difficulty of getting adequate supplies from the brick-yards not included in the combination, there is little doubt that, by next year, the smaller brick plants, which abound in all directions near Boston, will have increased their equipment sufficiently to compete with the combination for its customers. Very good bricks are made at Bridgewater, Barnstable, Fitchburg, Brimfield and Palmer, where well-equipped establishments, capable of a very large output, already exist, and hundreds of other places possess excellent clay, which is worked on a small scale, and will provide ample material to supply more extensive plants. Many of these establishments can sell bricks in Boston, at a satisfactory profit, for seven dollars a thousand, and the prospect of getting eight dollars would be sufficiently attractive to induce their owners to spend a good deal of money in adding to their equipment of the comparatively simple brick-making machinery. It is to be remembered that even in the larger yards, such as those of the combination, brick-making about Boston is carried on in a comparatively primitive and wasteful way. We do not know of a single Hoffman-kiln, for burning brick, in all New England. Although the best manufacturers know something of the immense saving in fuel and finished brick which can be made by its use, they have been in the habit of saying that its enormous output would overstock their market, and that it is better for them to pursue the old, wasteful and slow methods, the extra cost of which is, of course, paid by their customers. In the same way, the dry and half-dry processes, so universally employed in the more enterprising West, are scarcely known in New England, where, so far as we are aware, only one attempt, a very unsuccessful and short-lived one, has ever been made to use them; and, instead of storing under cover, and drying by machinery, the managers of even the great yards of the combination pile their freshly-moulded bricks in the open air, where, according to their own account, they have lost this year "several millions" by rain, and four millions more by "cold weather." A first-class modern brick-making plant ought to have little difficulty in competing for trade with establishments which cling to such antiquated methods, and, if the combination leads to the foundation of a more scientific and economical system of manufacture, as it seems likely to do speedily, the building interests in and about Boston, although they lament now, will have cause to rejoice in future.

OFFICE-HELP FOR ARCHITECTS.¹—XII.

Fig. 45.

SECTION III.—GIRDERS:

§ 203. Materials:—Wood, wrought-iron, steel.

§ 204. Wood Girders:—May be made in three ways:

(a) By using a "belly-rod truss" as shown on Figure 45, in which we have for uniform loads:

Tension in

$$R = \frac{0.3 LB}{C} \quad (34)$$

Compression in

$$C = \frac{1}{2} L \quad (35)$$

Compression in

$$B = \frac{0.3 LB}{C} \quad (36)$$

The beam should be made so that B is strong enough to support the $\frac{1}{2}L$ which comes on it. The tension rods R should be made of steel with upset threaded ends and placed one on each side of the beam. The bearing-plate at the ends should be made of cast-iron and should have as area in square inches

$$A = \frac{R}{600} \quad (37)$$

in which R is as found by Formula (34).

C should be made with a wide chair bottom to prevent all tendency toward rocking.

(b) By trussing as shown in Figure 46 using beams for the top and bottom members and tongued and grooved planks for

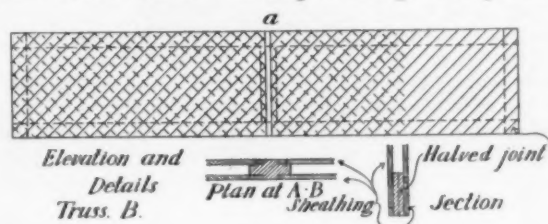


Fig. 46a.

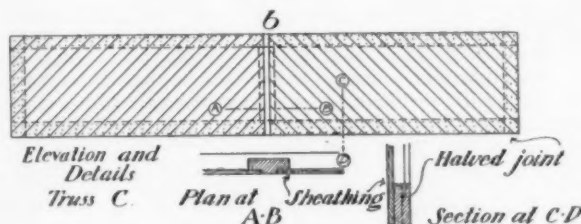


Fig. 46b.

the web members. The area of the top and bottom flanges is found as follows:

$$M = a \times d \times St \quad (38)$$

in which

M = the maximum bending-moment as found by Chapter II.

a = the area of the top and bottom flanges.

d = depth in inches from centre to centre of flanges.

¹ By George Hill, Consulting Engineer. Continued from No. 909, page 132.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
|| parallel to.	□ square feet.
÷ divided by.	□ square inches.
× multiplied by.	8* read 8 pounds per lineal foot.
+ added to.	□ channel bar.
a^2 a multiplied by itself.	□ I-beam.
$a > b$:— a greater than b .	□ T-iron.
$a < b$:— a less than b .	□ angle iron.
a/b :— a divided by b .	□ deck beam.
	○ round section.
	1 ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
	l = the length between supports of any beam or girder or height of any column, always in feet.
	b = breadth of any beam or girder, always in inches.
	d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.

The truss should be made of good sound timber, as deep as practicable but at least as deep in inches as $l \times 0.8$.

The web should be stripped with $\frac{3}{4}$ " or $1\frac{1}{4}$ " tongued-and-grooved stuff put on diagonally on both sides and thoroughly nailed with at least two nails at each end of each piece. The

centre piece should be made of $2" \times 6"$ stuff, gained at each end $1"$ onto the flanges and rebated $1" \times 1\frac{1}{4}"$ on the sides to receive the ends of the boards.

This truss will be less affected by the shrinkage than any other truss that can be made of wood, at the same time the results of careless workmanship will not detract from the strength of the truss and will but little affect it. With any of the framed trusses if the bearings are not most carefully made and tension-rods provided to bring all up to a

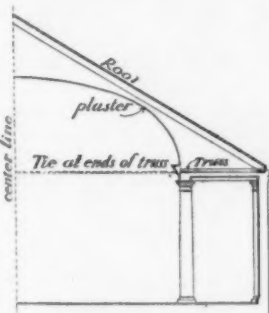


Fig. 47.

firm bearing and then tightened as shrinkage occurs, the truss will sag badly.

(c) Similar to (b) but with a single line of stripping, laid on its side to take up the thrust from a wide roof span where it is desired to dispense with tie-rods. In this case the flanges are to be made to be self-supporting between the columns and the trusses on opposite sides of the room must be tied together across the ends so that the thrust shall act one against the other. The nailing of the stripping on which the truss depends for its strength must be done so as to give at least one nail for each $1\frac{1}{4}"$ of width of the boards and must be staggered if necessary. (Fig. 47.)

§ 205. Metal Girders:—Are usually made up of plates and angles, though other shapes are sometimes used for particular purposes. They should be made of steel, and should be used whenever sufficient strength cannot be obtained by using two beams. Where the depth is limited so that it is impracticable to obtain a depth in inches equal to $0.6 l$ plus $3"$, then more beams may be used. (Fig. 48).

§ 206. Proportions:—The deeper the girder is, the more economical it is, but it should never be made less in depth than a beam would be for the same span. Formula (38) gives the maximum bending-moments, d being taken as out to out of the connecting angles. Where the conditions of loading are other than uniform, the bending-moments should be determined graphically, as described in Chapter II. Transposing Formula (38), we have for the flange areas

$$a = \frac{M}{d St} \quad (39)$$

Webs:—Should be made from $\frac{3}{8}"$ to $\frac{3}{4}"$ thickness. One

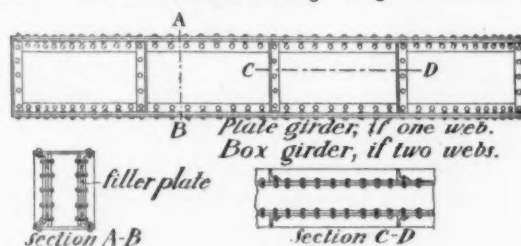


Fig. 48.

where the flanges are $14"$ or less in width, or the requirements call for no more than $\frac{3}{4}"$, and two for all other cases.

Calling the required thickness in inches t and the other L ,

L = total load uniformly distributed coming on any piece in pounds.	
L^2 = " " " " per square foot in pounds.	
W = concentrated load on any piece in pounds.	
S = span of any arch or truss between centres of end pins in feet.	
A = area of any section in square inches.	
M = maximum bending-moment in inch pounds.	
n = distance of centre of gravity of section from either top or bottom edge in inches.	
I = moment of inertia, neutral axis through centre of gravity.	
R = moment of resistance of section.	
r = radius of gyration, in inches.	
Sc = safe compressive strain in pounds per square inch.	
St = " tensile " " " " " " "	
Ss = " shearing " " " " " " "	
S = strain per square inch in extreme fibre.	
P = upward reaction of support at left-hand end of beam.	
P' = " " " " " " " " " " " "	
e = distance of centre of gravity of load from left hand of beam.	
f = " " " " " " " " " " " "	

that gives a bending-moment equivalent to that found, using the formula:

$$L = \frac{8M}{t} \quad (40)$$

then

$$t = \frac{L}{S_e d} \quad (41)$$

If there are two webs, make each web equal to $0.6t$, but never less than $\frac{1}{4}$ " in thickness.

Stiffeners:—Whenever a girder is strained with a concentrated load, the webs under the point of application of the load and at the ends of the girder must be stiffened by means of L s riveted to the webs. The aggregate area of L s needed is found by formula

$$A = \frac{0.75 W}{S_e} \quad (42)$$

Then divide A by the number of L s it is proposed to employ. This will give the area needed in each L , which should be so gauged as to give the same thickness as that of the web-plate. The L s should be riveted on with $\frac{5}{8}$ " rivets spaced about $5"$ c to c with filler-plates put in between the L s and the webs of the thickness of the connecting L s, so that the stiffening L s can lay over the connecting L s. For girders uniformly loaded, use $3" \times 3" \times \frac{1}{4}"$ L s spaced, c to c , a distance equal to the depth of the girder, and riveted up with $\frac{5}{8}$ " rivets $6"$, c to c , with filler-plates only.

Flanges:—Should be made with two L s and as many $\frac{1}{4}"$ plates as are necessary to get the proper area of flange. The L s called connecting L s must be wide enough to take all the rivets spaced $2\frac{1}{4}"$ c to c and staggered, placed $1\frac{1}{4}"$ away from the edge of the plate, and $1\frac{1}{4}"$, c to c , longitudinally. The angle should be of the same thickness as the webs, and should have the two sides equal. Having found flange-area by Formula 39, the area of the plates alone will be found by the formula:

$$\text{Area of the plates} = a - (L's - 8 \text{ times thickness of webs}). \quad (43)$$

The area of the L s would be determined by using some L of the same thickness as the web, the pier taking about 30% of the total flange area.

The area of the plates being determined, the width should be made about $0.6l$, or equal to the width of the two L s and the web-plate; the $a \div$ width gives the thickness at the point of maximum bending-moment.

Now draw a line tangent to the strain polygon below the maximum point (Fig. 49) and then divide the distance from this point to the horizontal line through the upper end of the closing line into as many parts as there are quarter inches in the thickness of the flange. Through the points of division so found draw horizontal lines intersecting the strain-polygon, extend them $6"$ by scale beyond the polygon on each side and

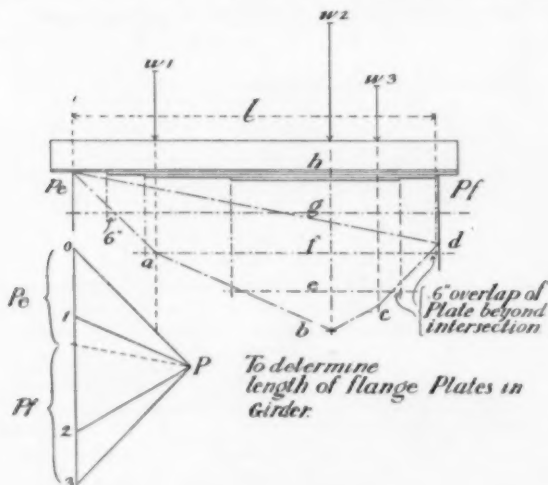


Fig. 49.

then draw verticals to the lines next below, this will limit the lengths of the various $\frac{1}{4}"$ plates of which the flanges should be composed. When the flange areas are such as to require a thickness approaching $2"$ the plates should be made $\frac{1}{2}"$ thick.

No flange should exceed $2\frac{1}{2}"$ in thickness. Sizes of webs, flanges and connecting L s may also be obtained by the use of the moment of inertia I , of the section, figured from the moment of resistance M , thus effecting an economy in the amount of metal used of about 10%.

Shear:—Shear equals the reaction of each abutment at each abutment and equals 0 at the point of application of the load or at the centre of a uniformly applied load. If then on the plat of the beam we draw vertical lines representing the reactions at the abutments, plotting the loads to any convenient scale and then connect the extremities of these lines with the point of no shear by means of straight lines, the shear at any point in the beam will be equal to the distance from this point to the lines last drawn measured by the same scale that laid off the abutment reaction. From the shear so obtained we find the proper number of rivets by the formula

$$\left. \begin{array}{l} \text{Number of rivets} \\ \text{required for} \\ \text{flange length} \\ = d \end{array} \right\} = \frac{\text{Shear at point considered}}{\text{Bearing value of rivets in web.}} \quad (44)$$

Note that the length of flange considered is equal to the depth of the girder and that the same number of rivets are required for the webs and flanges. These rivets should be either $\frac{5}{8}"$ or $\frac{3}{4}"$ and should be spaced as before described. Should Formula 44 give an excessive number of rivets, they can be reduced by increasing the thickness of the web.

Jointing:—Should be avoided as far as possible as it is very difficult to make the joints as strong as the solid metal. Where it is necessary to make joints they should be made with wide cover-plates and continuous L s so planed as to fit exactly to the surfaces to be joined and the riveting should be very carefully looked after.

Riveting:—See the points as above and note further that all holes in metal of above $\frac{5}{8}"$ must be drilled, all holes in thinner plates should be punched and reamed. All rivet holes should be so accurately spaced as to admit of the passing of the rivets by hand.

Rivets should project on the side to be riveted a distance equal to $1\frac{1}{2}$ diameters so as to have enough end to rivet well, forming up a good head. The riveting of more than six $\frac{1}{4}"$ plates by hand cannot be done and should not be attempted.

Connections:—Should be made with L s the same as for beams and should be all riveted.

§ 207. Points:—Oftentimes, owing to the shortness of the span, a $10"$ or smaller beam would be sufficient to carry a $15"$ beam framing into it but for the sake of making it look strong enough a C of the same size as the larger beam should be used. Be particular that the painting is thoroughly done both before and after erection. Insist on having all connections riveted. Use cast-iron only for separators, small column bases and for beam rests. When so used the plates should be made $\frac{1}{4}$ as thick as the blue stone they supplant.

§ 208. Loads:—In addition to the dead loads on floors as given in Chapter IX, provision must be made for carrying live loads as given in Table XII.

TABLE XII.

LIVE LOADS ON VARIOUS FLOORS.

Dwellings, narrow city	90 pounds per square foot.
" medium "	85 " " " "
" broad "	75 " " " "
" suburban	75 " " " "
Public halls, churches, etc.	100 " " " "
Office-buildings	100 " " " "
Armories, gymnasiums, stores	150 " " " "
Warehouses, minimum	250 " " " "

In addition, for the parlor floor or any floor on which it is probable that there will be dancing or marching, the loads should be increased 25% so as to provide for the effect of the rhythmic movements. In this case the load on the girders would not be increased as the beams would take up the vibration largely.

§ 209. Layout:—For all important works each floor should be laid out in outline so as to show all of the circumstances affecting the beams and girders, then the beams and girders should be laid out in heavy lines and the size of each piece marked beside it or else marked in a table made above or near the plan, in either case the beams should be numbered for purposes of identification. It is very convenient to have these

iron plans made to a reduced scale so as to get all of them on one sheet, the same size as the sheets used for the other floor plans, and then for purposes of the superintendent they can be photographed down so as to be carried in the pocket.

§ 210. **Computations:**—There are two ways of keeping the computations, one that of plotting all beams and girders that are not uniformly loaded, in a special book kept for the purpose, and the other to plot all of the beams and girders on a sheet prepared for the purpose by roughly tracing all off the $\frac{1}{4}$ " scale floor-plans, then marking the framing on them with a blue pencil and keeping these sheets as the record. Either way is good, the writer preferring the latter for all but the simplest work. In either case, the date, name of work, assumptions as to live loads, dead loads, fibre strain and the number of the formula should be written down on each sheet. The graphical method and the slide rule should be used altogether, all figuring being written out so as to make the determination of the decimal point easy.

§ 211. **Fibre Strains:**—Should usually be made as follows:

Beams (steel).....	12,000
" (wood).....	600
Girders (steel)....	16,000
" (wood).....	800
Foundation material (steel).....	20,000

[To be continued.]

ANOTHER ARCHITECTURAL KNOCKABOUT.¹—II.



Gibraltar.

I NEVER knew, and I hardly know to-day, where to live in London cheaply—that is for men travelling as we did. I have been told (as one invariably is for the asking) innumerable addresses of lodgings more or less inappropriate to our needs and circumstances. It is always a burning question, if one is to be in town a fortnight or more, whether to go to a little hotel, or get a lodging on Nottingham Road, or some embankment or court. One utterly abhors "boarding" as we call it in this glorious land of America—even if one does have three moderately square meals per diem—and to sally forth of a morning in quest of rolls and coffee, or bacon and eggs, in a London fog, is worse. It is so much better fun, I think, to come down to one of those warm English breakfasts in a hotel, where you are received with open arms, by a genial rich-old-uncle-faced head-waiter, with the morning *Times* in his hand, and who, immaculate in a dress-suit, leads you with one of his best smiles to an open fireplace, pokes the blazing logs or coal, and incidentally remarks that there are "some very good fried kidneys" that morning. One converses upon the weather, and is asked about one's health, and encouraged by that smile to relate the family history and one's political views. Yes, this is great fun, and on balancing the lodging scheme (cheaper though it may be) and going out in the fog for meals—you usually have to mount a 'bus to reach a restaurant—against the hotel, the head-waiter, wood-fires and "fried kidneys," the latter generally conquer, and they did in our case.

Looking up hotels, we finally hit upon one, the "Arundel," near the Victoria Embankment, and directly opposite a station on the Underground. It is in a slit of a street, easy to find, when you have left it. We paid six shillings a day—this to some may seem high, but in London, with the excellent service we received, it was to my way of thinking most reasonable. Lunch and dinner were of course extra. That night I piloted George to the theatre, and was hugely pleased on finding my bump of locality had not gone back on me: we made a direct line through streets, squares and circuses, as if I had lived there all my life, though, between us all, I did march George three times round the Criterion and Circus, before getting into Leicester Square; but happily each time we completed a circle, things looked differently to him, so my glory was not reduced nor

our enthusiasm dampened, except by the fog which was very heavy and wet. In the morning George awoke complaining of the cold, and looking at the windows in our room said seriously: "Frank will you kindly inform me whether all English hotels have yellow glass in their windows that you cannot see through—it's a nuisance I think."



English Head-waiter.

Getting myself together, and looking out, I burst into laughter and explained to my cousin that the yellow effect was owing to one of the matutinal fogs that London is heir to, and that later, perhaps, one would be quite able to see through the glass. He said nothing, but I could see that up to that date London had not impressed him very favorably. That night we went out to an English whitebait dinner, served as that nation alone can prepare it.

Our next step was to see about a means of getting to Gibraltar, as I knew we must not delay too long in London, where it was easy to get about, and where, as George spoke English as well as I did, and could call a hansom or order a dinner with the same, if not greater, fluency and extravagance, it seemed better to move on to other climes, where he would be impressed with the

necessity of going slow upon our finances, and could not with such facility indulge his inclinations without calling into requisition my slender, though very wicked, knowledge of foreign tongues. So off we went to Leadenhall Street to the office of the great P. & O. S. S. line, where we found that the "*Ganges*," sailed upon the sixth of March for Gibraltar—"Gebel Tarik."

We engaged our passages and soon found ourselves booked for the extreme end of Spain, and precious near to "Africa's sunny shores." We were each given a fat envelope full of "pasters," with directions to apply one to each article of baggage we possessed or else something dreadful would happen to either us or them, I do not remember which. This we did and then found ourselves with considerable time upon our hands, in which to see all the sights, artistic and otherwise, which the great City of London affords. George was impressed by some, but foremost of all, though he would not acknowledge it, was Madame Tussand's, the Abbey, the Gallery and the Tower were quite secondary compared to the "Chamber of Horrors," while the guillotine simply entranced him, and it was with difficulty that I could get him finally away,—he always wanted to return. He was much surprised that I did not show equal interest; later, however, he developed many artistic characteristics (or my idea of them) and often found many quaint and picturesque bits for me, which without him would have been missed, and often he would wander away as I was sketching, appearing later in a state of great excitement and enthusiasm to explain that he had chanced upon a perfect gem, some old gateway or ruined chapel, and drag me off to see it; but the trouble with him was, that he never could find it again, though I always firmly believed that he had seen it, in spite of the "treasure" failing to materialize. We did not omit to call upon the N—s before leaving town: they all expressed great interest in our trip, and trusted that if we ever returned we would call upon them immediately. We smiled plaintively, and hoped that such good fortune would be our lot.

On arriving at the P. & O. dock, we were much interested to observe the Indian sailors, who swarmed everywhere, and took our shillings and luggage anywhere, whenever they had the chance. They were curious looking specimens of humanity, all of them undersized, spare and thinly-clad, and all having contracted terrible



George.

¹ Continued from No. 998, page 120.

colds: it was a pitiful sight to see them standing in line aboard ship for Sunday inspection, coughing, and at the same time swaying backward and forward; their cough, too, was not human, but like that of a kitten suffering from consumption, and coughing in a plaintive painful key. It took about eight of them to lift an ordinary trunk, and



Mr. G.—

their poor little be-turbaned heads seemed to be only top-knots to keep them from ravelling out.

The captain was the typical English merchantman skipper—jovial, fond of show, resplendent in gorgeous uniform, a great many stripes and buttons and the orthodox English whiskers and moustache, dispensing the courtesy of the ship to the fair sex, and the spirit of camaraderie to that of the brutal. In order to get the ship out of the dock, it was necessary to back-haul her for nearly a mile, stern foremost, down a narrow canal-like

harbor. Two tugs, or apologies for them, performed this tiresome and difficult operation, constantly stopping to pull our good steamer off a pier or wharf or drag away a mud-scow lying athwart the whole passage. After an hour and a half of this sort of thing, we were set loose, and turned around to continue on our own hook and propelling-power.

George and I watched this operation for a long time without a word. Finally we were both so exasperated, that we, with a shrug of our shoulders turned away and went to explore our ship and our stateroom. This time, by the divine right of possession and the fairness of things (also not risking any more chances on the heads-or-tails business), I planked myself and baggage in the lower berth and vowed that he could only take possession over my dead body. The stateroom was much larger than that on the "Britanic," and much more gorgeously decorated. The berths were spacious, but the lattice-work partitions between all the staterooms (constructed for the better circulation of air in the tropics) were hardly a boon off England's very frigid shores, or during the high winds of the Bay of Biscay, or the land hurricanes which frequently whistle off Cape Finisterre.

The ship was staunch and well planned with the exception of the inadequate smoking-room accommodations, the deck-room being principally given up to resplendent saloons for ladies. The passengers were very interesting, being of a truly English type, with Bombay officers and merchants going to India for their several duties and occupations, after holidays spent in England.

We were the only Americans aboard and, being young and perhaps a trifle impulsive, in some ways proved a great source of amusement to the others, as we were only too ready to be drawn into argument about our respective countries, and as over patriotism and loyalty to our customs was a trifle too pronounced and outspoken, we got into some trouble. One afternoon I was nearly thrown overboard by a lot of English officers, when replying to a remark of theirs—that we were not big enough to support a navy—I used the time-honored retort, about the possibility of our "putting their confounded little Island into one of our fresh-water ponds some day, and keeping it there." Had it not been for George backing me up and stoutly declaring that they would have to step over his dead body "to do me up," undoubtedly my career would have ended. However, we soon

forgot all disputes, and as my tobacco was as good as, if not better than, theirs, and as I disappointed them in not talking through my nose or hat, but sang with George "Way down upon the Swanee River," to their entire satisfaction, we were taken into the fold, and treated like wild, but companionable, animals. One old fellow, a Mr. G—, took us to his heart and stood by us bravely. About forty-five years of age—we never could tell exactly; he had apparently no *modus vivendi*, beyond wandering where his fancy dictated. He acknowledged to us, that he didn't know from the start where he was going, or where he would like to go. It depended, he said, on just "how warm he got," his one object in life, he remarked, was to "feel warm just for once," had not "felt so" certainly for six months, and if the ship ever reached a warm climate, he would ask for nothing more in life.

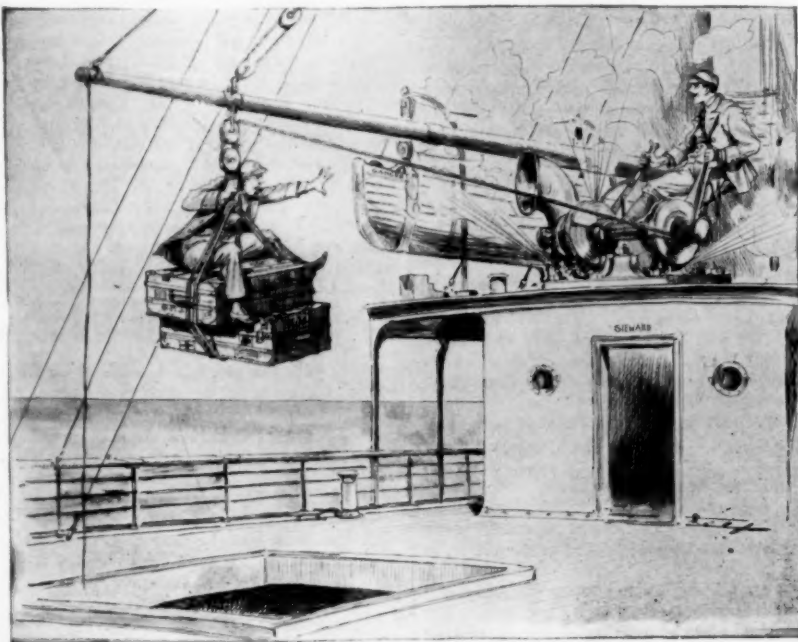


Captain of the "Ganges."

There were a few Baronets and Colonels, a few pretty, but badly-dressed girls, a swell Arab merchant and a lot of rough, pipe-smoking commissioned officers aboard, the latter never wore overcoats, but with their cheeks aflame, their hands in their pockets, their trousers turned up and wearing tennis-shoes, they plunged about, with the wind blowing an icy gale of forty miles an hour. As to the ladies, they were not very interesting to George and me. We were again *vis-à-vis* with three of the fair sex, one an old maid who chaperoned the other two, who while not very young were pretty in face; but frightfully radical and egotistical in their views. They were neither pleasant to talk to, nor clever, but drew out their remarks, as if it cost them a great effort, as well as being a condescension on their part to exercise the larynx at all. Every woman and the majority of the men, aboard the "Ganges" dressed for late dinner, and to this meal all the elegance possible was imparted. The captain put on his society manners and uniform, and became radiant accordingly, while his subordinates arrayed themselves with all the "lugs" compatible with their positions. At dinner we were treated to the regular line fare aboard a P & O ship, and the wonderful and elaborately gotten-up mixtures, such as "beefsteak kidney pie," or "Irish stew," with a relish called "jerked fish," and curried everything, including courses of every sort and condition of leaden ship's-pastry—all but finished us, before we could finish it. We managed to make a meal, however, as the ship carried an extensive wine-cellar aboard, and all one had to do to procure a drink, was to sign a check, as in a club.

The trip was uneventful, save for being an unconscionable time in

"Biscay's troubled waters" (which unfortunately, are angry about something most of the time), and that the coast of Spain and Portugal was often visible to the naked eye, as we coasted down. I remember having Cape Finisterre pointed out, and told that many vessels had been wrecked off that point. The general bad weather that we encountered prevented much outdoor amusement, or agreeable exercise, save now and then an uphill game of "quoits" or a down-hill play at "ring-toss." Some of the very bright, and ingenious officers got up two ten-shilling pools, on the ship's run, for a certain fixed day; we all went in, of course, but got no prize. The managers divided with the first officers,



and guessed the run to a fraction of a knot, thus being able to pay their wine bills, as well as a good round fee to their steward, all at our expense.

I shall never forget the first sight of Gibraltar as we steamed up the Straits, which were most frightfully rough. This was very

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noticeable, as we had been sailing in comparatively smooth water, no motion to speak of being felt, when suddenly we began to rock from side to side in short disagreeable rolls, continuing until we were within the breakwater opposite the north fort. It was with great curiosity, interest and awe that we looked upon this gigantic fortress, severed as if at a blow from the distant blue heights of the African coast, fourteen miles away. Its apparent armament and defences, besides the grandeur of its picturesqueness, were most impressive. Great frowning cannon protruded from every nook and corner of the great gray rock, and with a glass, one would search the underbrush only to discover a masked battery, or a "Long Tom" hidden away in ambush. The enormous galleries hewn within the rock literally honeycombed the mountain and the exterior gave no sign, save for occasional sentry-stations, of the vast powers for war within its fastnesses. It was a splendid sight, with its huge cliff rising to the sky, the aspect of defence so very prominent; while nestling away amidst the dense green and beautiful foliage at the foot, lay the peaceful and pretty little white town. Grayish roads wound zig-zag far up the height, and from the very apex could just be distinguished a wire railroad, descending to the base, by which soldiers and batteries can at a moment's notice, and almost in as short a time be carried to the very top, to pour from this commanding position, a deadly rain onto any invader who has the temerity to approach with hostile intentions.

Being supplied with passes to land from the ship we said "good bye" to those we cared about aboard, and then frantically tried to find our baggage, which, in spite of the "pastors," we discovered to be still in the ship's hold, the stewards and sailors having boycotted us, why, I do not know, (having feed them well all the way over). It was their idea of a joke, perhaps, or else because we were the only Americans aboard, and perchance a trifle too independent. Nothing daunted, George and myself opened the hatchways which had been reclosed, as the sailors or whoever had charge of the arrangement had gone ashore. George descended into the hold, and by the help of a lantern, which he found, discovered our trunks. I, meanwhile, had "monkeyed" with the donkey-engine, discovering in its peculiarities which perhaps to an individual more familiar with its mechanism would not have been so apparent; the tackle by which they lift up the cargo, finally, and unexpectedly descended, just in time to impress George with my skill, and he cleverly affixed the gear to our trunks, and placing himself picturesquely on top, hailed to be lifted out. I tenderly reversed the engine and when all was ready started her up, and slowly but surely our luggage, with George astride, appeared above the docks; but at this pleasing and satisfactory juncture the engine would not stop, and the precious freight ascended to the top of the crane and there dangled, far out of reach, over the depths of the hold, both trunks and George, the latter exhibiting a facial expression not easy to forget. It was some time before the cranky thing would consent to occupy any intermediate point, save that at the very top of that crane or the very bottom of the hold, but George pluckily held on and was finally rewarded by finding himself suddenly, but safely, on the deck again. With our own hands we had to pull our trunks to the ship's side, and hail a "felucca" to row us ashore. Embarking in this very narrow boat (they have steam-tugs now) we were finally deposited upon the stone pier of the north front, where we were accosted by a great deal of uniform, worn by several apparently important personages, who informed us that as we were Americans, they would have to go through our luggage for "concealed weapons," and were exceedingly disappointed on finding none.

F. L. V. HOPPIN.

[To be continued.]

FLOORS OF PUBLIC BUILDINGS.—The safe resistance of floors in public buildings and other places where dense crowds are likely to congregate is a question of vital importance. From recent experiments it would appear that architects do not work on safe calculations regarding this matter. It is generally understood that a crowd of people when densely packed together cannot impose more weight than ninety pounds per square foot. The tests referred to, however, show that the dead load should far exceed that amount. Mr. C. H. C. Wright, lecturer in architecture at the School of Science, Toronto, in some experiments last March with thirty-two of his students, found that when they were placed close together in an area of 33.46 square feet, there was a load of 139 pounds to the square foot. Their aggregate weight was 4,656 pounds, which shows the average weight to be 145.5 pounds. Mr. Bindon B. Stoney, the distinguished authority on bridges and roofs, has also conducted two experiments along this line. He packed a crowd of fifty-six laborers on the deck-house of a ship, giving a total weight of 8,404 pounds, or an average of 145 pounds. As the area covered was 57 square feet, each man had a little less than one square foot of standing room, and gave a load of 147.4 pounds per square foot. On another occasion he collected 73 laborers on the floor of a hut having an area of 77 square feet. Their aggregate weight was 10,948 pounds, an average weight of 150 pounds to each. The result gave 142 pounds to each square foot, and there was a possibility that two or three more men could have been squeezed in. Professor Kernot, of Victoria, tried a similar test with his class of engineering students. He packed 16 of them weighing 2,455 pounds, within an area of 18 square feet, which shows an average of 136.4 pounds to each man. The weight per unit of area was therefore 134.7, and there still remained unoccupied space. From these figures it would appear that the resistance of floors which are likely to carry heavy weights should not be less than 300 pounds to the square foot, for as the average dead weight comes close upon 150 pounds per square foot, double that strain should be allowed as a provision against sudden movements in a crowd, as in the case of a panic.

—Canadian Architect

MODERN ASYLUMS FOR THE INSANE.—I.



House in Avenue Wagram, Paris, France: S. Sauvestre, Architect. From *Architektonische Rundschau*.

THE provision of a sufficient number of asylums for the care and treatment of the insane has become one of the most serious questions of the day. Having due regard to the other and numerous responsibilities which are imposed upon the community, much larger sums have probably been expended upon this class of building than the public could well afford. Enormous amounts of money have been, and are still being, laid out upon this class of building, too often, it is feared, without corresponding advantages, for hitherto asylum-planning has been limited to the few, and open competition upon these great works in England has been greatly discouraged.

In the following papers, which we have prepared for the readers of the *American Architect*, by the invitation of its editors, we purpose to give a description of the various works required in the erection of a large asylum for pauper lunatics, and of the numerous apartments required for the officials, from the medical superintendent to the laborer.

Since the first Act of Parliament was passed in England, in 1744, to control the working of these establishments, so vast and manifold have been the changes and improvements that we are scarcely able to realize in this enlightened era the terrible scenes that were enacted in the dark days of the past, when insanity was treated as a crime, and patients were chained, caged and chastised like wild beasts, and their keepers allowed to derive a revenue from their public exhibition. At that period they were frequently kept huddled together without discrimination as to sex, and it was not an uncommon sight to see one hundred and fifty male patients in one room, some of whom were chained to the wall, suffering from every form of disease and every type of madness—some melancholy, some furious. The condition of the female patients was even more pitiable, herded together, as they were, in numbers, crawling on their knees, half-clothed, some indeed with but a piece of cloth tied round the waist by a length of cord or rope. Such scenes appear incredible to the present generation.

Yet a fair idea of the interior of a mad-house about the year 1750 may be formed from Hogarth's picture of "The Rake in the Mad-house," wherein are depicted lunatics of varied character occupying the one room, some nude and chained, while the public evidently have no difficulty in gaining access, to make the room a show-place.

This ignorant treatment of insanity contrasts greatly with that given in the fourteenth century to the King Charles VI, of France, which is described by Froissart in his chronicles, which mentions one Master William de Harseley, who cured the king of his madness by a common-sense system resembling, in its details, our modern methods.

Old buildings, such as prisons, monasteries or other edifices, worn

¹ By George H. Bibby, F. R. I. B. A., F. R. Hist. S., and Ernest A. E. Woodrow, A. R. I. B. A.

out, or unsuitable for their legitimate purposes, were too often the only homes for the lunatics in days gone by; it was not until the present century that the consideration of this important subject was seriously taken in hand, and this was after an act was passed, which compelled the erection of county asylums throughout England, by the authorities of the Quarter-sessions. We are unfortunately unable to agree that this duty was either admirably performed by the county magistrates, or that the modern English asylum is an institution which should be looked upon by the world as a desirable model, either as regards arrangement or management; yet any person who for the first time enters upon the premises of some of our large provincial asylums cannot fail to be struck with much that is admirable in the plan, the comfort and even luxury provided, as well as the beauty of the surroundings and the costliness of the sites which have been selected.

It has been well stated by an asylum-architect that "asylum-construction differs from other branches of architecture in its relation to hygiene, in that it demands a consideration of the mental as well as the physical welfare of the people, and no architect can hope to attain much success in asylum-construction who does not devote some study to the nature of the malady and habits of the unfortunate class for whom to provide accommodation."

During the past thirty years, the number of registered lunatics in England has nearly doubled in proportion to the population, the increase being partly attributable to the withdrawal of patients from the workhouses, the inclusion of cases which, a few years since, would not have been regarded as "insane," and causes of a kindred nature. It must therefore be noted that, as a greater proportion of cases are less acute than in years past, statistics as to cures cannot be advanced in support of the great advantages derived from modern systems of custody and treatment.

The importance of reducing the cost per bed, in the erection of an asylum, will not be over-estimated if it be remembered that, for the County of London alone, additional accommodation for more than two thousand patients must be provided every five years, to keep pace with the continual increase of insanity; therefore it is most desirable that there should be a careful consideration and comparison of new and old asylums, and of the cost of working these as well upon old as upon new and untried methods, prior to the erection of others upon similar models. In arranging for certain classes of lunatics, both architects and their employers must consider whether many of the patients would not be better replaced in the workhouse, with the advantage of affording more space for the worse cases.

The total cost of land, buildings and fittings as well as the cost of maintenance, during a sufficient term of trial, should be accurately ascertained, and the results made more public than hitherto. New systems of heating, ventilation, lighting and other matters should be tested as well with regard to their suitability for small as for large institutions. The proportion of cures to the whole number of patients should be ascertained with greater exactitude, that none partly cured return to propagate their calamity to future generations. It is to be feared that a very large proportion of known incurable insane paupers are housed at an outlay, *per patient*, that would provide a very comfortable residence for a well-to-do artisan and his family. Although these, at first sight, appear purely social questions, yet, in the course of these articles, we hope to show that they are serious problems, which the asylum-architect has to solve.

There have been recently distributed amongst those interested in the promotion of the building of asylums copies of a pamphlet upon the subject, the author of which—an architect, be it noted—writes as follows: "A word in passing about competitions which are unfortunately gaining ground. I say unfortunately, because they are not always calculated to produce the best results." Now, it appears to us that it would be a matter of deep regret if asylum-planning should continue in England to be limited to the few, and that fair and open competition upon such works, amongst architects in this country, should be discouraged, for the community is greatly in need of all the ability and invention that architects can bring to bear upon this important class of buildings, and, without wishing to detract from the abilities of the architects whose practice tends exclusively in this direction, we would point out that a number of architects who have really a large experience of such undertakings and also many architect's assistants, who, having been specially trained in asylum works, are waiting their chance for admission to competition and the opportunity of gaining their first commission.

As it is necessary that an architect should be acquainted with the habits and customs of the various grades of society for whom he designs habitations, so also it is necessary that a man who arranges the plan of an asylum should know what kinds of apartments are required for the insane and in what manner they should be classified. There are various modes of classification and the difficulties of the subject are extreme, as will be seen when we consider only the differing symptoms the same individual may at different times present, and the many features of the several forms of insanity which are often recognized as distinct. The best authorities are of the opinion that it is difficult to draw up a scheme of classes into which cases of insanity are to be grouped: no such division exists in nature, and to create them would be a proceeding that would not accurately represent the facts.

The architect must bear in mind that the conduct of the insane is not necessarily insane conduct. Most people suffering from mental diseases act in many things as do comparatively (perhaps absolutely)

sane persons, and this part of their actions is regulated in the same way as that of ordinary people; only the insane portion of their conduct is incorrigible, and so long and so far as they are insane the incorrigibility of the behavior is absolute.

The difficulty of classification may be gathered from the following statement by the superintendent of an asylum. "In one ward of an asylum of which I had charge there used to occur a number of unaccountable black eyes. The attendants were frequently cautioned, and frequently changed, and yet the black eyes occurred, and were usually found on those patients who were too feeble to protect themselves and too demented to give an account of how they received them. At length, among the admissions was a little quiet, undersized Irishman, who was placed in this ward, and the next day a patient, G. S., who had been zealous in endeavoring to discover the source of the black eyes, received from the new admission a tremendous thrashing. His explanation was that the attack was unprovoked, but the Irishman asserted that G. S. had hit him in the eye, and he, being an ex-pugilist and a former light-weight champion, had promptly retaliated; the result was that no more black eyes appeared in that ward. In this case G. S.'s conduct was not insane, but was merely the gratification of the bullying and savage instincts of a low and brutal nature. No amount of punishment would have altered the *really* insane portion of his conduct." From this the architect will gather that the feeble and demented require not only to be protected against themselves but also against the attacks of the brutal, whether these be other patients or undesirable attendants. The proportions of the various forms of mental disorder existing in the four asylums of the County of London, England, on the 31st of December, 1891, is as follows:

FORM OF MENTAL DISORDER.	Remaining in the Asylums.		
	Form of Mental Disorder, 31st December, 1891.		
	Male.	Female.	Total.
Congenital or Infantile Mental Deficiency—			
(a) With Epilepsy.....	26	33	59
(b) Without Epilepsy.....	115	89	204
Epilepsy acquired.....	339	351	690
General Paralysis of the Insane.....	194	84	278
Insanity with—			
Delusions.....	.....	.....	.....
Hallucinations.....	.....	.....	.....
Senility.....	.....	.....	.....
Stupor.....	.....	.....	.....
Idiocy.....	.....	.....	.....
Mania—			
Acute.....	154	199	353
Chronic.....	806	1,176	1,982
Recurrent.....	121	296	417
A Potâ.....	11	0	20
Puerperal.....	.....	61	61
Senile.....	51	112	163
Melancholia—			
Acute.....	97	191	288
Chronic.....	319	388	707
Recurrent.....	40	122	162
Puerperal.....	.....	25	25
Senile.....	30	92	122
A Potâ.....	6	.....	6
Dementia—			
Primary.....	43	32	75
Secondary.....	381	786	1,167
Senile.....	98	171	269
Organic.....	25	196	221
Not Insane.....	.....	.....	.....
Convalescent on Admission.....	.....	.....	.....
	2,856	4,413	7,269

Mem.—837 recovered and 746 died in these four asylums in 1891.

The first question for the architect to consider with such a classification as the above is the considerably greater proportion of female lunatics above male lunatics, and the next is to arrange his plan, both on the male and female sides, into four or five main classifications. Disregarding the more numerous items above given, the English Commissioners in Lunacy, in suggesting means for the construction and arrangement of asylums, are of opinion, as an approximate rule, that the provision in a new asylum for the different classes of patients may be in the following proportion:

Sick and infirm.....	20
Epileptic.....	20
Recent and acute cases.....	20
Working, quiet and chronic cases.....	40
	100

But they state that this rule will require modification in the cases of very large asylums, and those for not exceeding 300 patients. In all large asylums, it is desirable that there should be in each division a small ward in which newly-admitted patients may be placed under special observation, with a view to classification; dormitories, with a few single rooms communicating, should be set apart and arranged for the care and supervision, during the night, by special night-attendants, of suicidal and epileptic patients. The accommodation for the male and female patients should be kept distinct on either side of the centre, and the building should be constructed to admit of the separation of the male and female patients, respectively, into at least four classes. As female patients usually preponderate, the plan should

provide more accommodation for that sex than for males, and should be so designed as readily to admit of extension on either side. No ward should be designed for a less number of patients than would ordinarily require the services of more than one attendant.

The asylum having been designed so as to provide four or five separate blocks, or divisions, for each sex, and each block having its various day-rooms, single rooms and dormitories, etc., the medical officers can subdivide the minor classes of lunatics as may be found desirable. And here it may be suggested that the patient who may be safely associated during the day with other patients of a certain description may not always, either for his own advantage or theirs, be also placed in the same dormitories, and this for various reasons; for instance, persistent sleeplessness is a condition which is highly favorable to the development of insanity, and in most acute attacks of madness sleeplessness is a prominent feature. Doubtless the insomnia of incipient or early suffering is to some extent a symptom and a result of the morbid process in the brain which underlies the insanity; but none the less does it assist and reinforce the process to which it is primarily due. We find that in acute outbreaks, which are accompanied by sleeplessness, the induction of sleep is usually followed by improvement of the patient, while cases in which insanity has become developed without the accompaniment of insomnia are, as a rule, less hopeful. These are arguments for the consideration of architects, who will thus perceive the absolute necessity of providing such an arrangement of apartments as shall secure that patients shall not disturb, or be disturbed, at times when they should be asleep.

(To be continued.)

THE SALON DES CHAMPS ELYSÉES.



Carved Wooden Frieze in the Chateau de Saint-Georges. From *La Semaine des Constructeurs*.

HERE are not many countries which could produce such a quintette of magnificent portraits as those of MM. Bonnat, Morot, Comerre, Lefebvre and Henner; all so fine, I was going to say equally fine, and yet so different in workmanship. M. Bonnat's portraits are so well known, it need only be said that the old lady (his mother, I believe) in black velvet, is one of his most vigorous works. M. Lefebvre's "Mme. Veuve Raspail," is a wondrous study of different tones of black stuffs; M. Henner's "Mlle. M. Sue" is one of the subtlest of that great master's gems of color. But M. Comerre's little fair-haired child arrayed in red, is a great advance on anything this painter has done heretofore, and he is coming very close to Madrazo. This little girl, standing erect in a long gown with puffed sleeves against a rich brown background, is a masterpiece. The exquisite tints of the complexion, the richness of the red gown with its blue reflected lights, and the skill with which the blue and gold embroidery is touched-in, are alike remarkable; besides which, the whole picture is *distinguée* and refined. So, too, is the portrait of the lady hard by. How many artists could steer clear of vulgarity in painting a lady in a gorgeous gown of heliotrope be-trimmed with lace and adorned with jewels; and with surroundings of yellow and pink chrysanthemums against a creamy-white damask background? Yet, not only is the picture distinguished by style and refinement, but it is an example of the most exquisite harmony.

M. Rochegrosse's "Pillage d'une Villa Gallo-Romaine par les Huns" represents the barbarian chiefs seated upon rough little horses such as gypsies now indulge in, while their soldiers are slaying the inhabitants of the villa. Upon the ground is the dead body of the head of the house; on the right, the serving man, an old woman and a girl are kneeling, with their hands tied behind them. At the doorway their mistress is struggling with two rough brutes who are carrying her off. Flowers are being trampled down by the horses, and the ground is covered with spoil. Here is a subject that is treated by such a master of the brush as M. Rochegrosse. The color is beautiful, and the character expressed in the faces of the refined Roman servants, opposed to the brutal savagery of the Huns, is worthy of attentive study. But the subject is unpleasant and revolting; one only cares for the superb technique.

A more agreeable picture to possess, is M. Leroy's "Un soir à Nazareth," which may be described as an Annunciation with the angel left out. The Blessed Virgin is seated upon the stone wall of a house-top; behind her is a grove of palm trees, and beyond, the sunset sky. She is veiled, and holds the distaff in her hand. Her expression is that of wonder and amazement; she is not beautiful, but is of a typical Jewish type—perhaps not young enough—that is a common fault. But the originality of the treatment consists in making the angel invisible and thus giving the subject a purely realistic reading. The maiden's expression is sufficient to supply the angelic appearance to all who have a spark of imagination, and the

omission of the supernatural is an immense gain to the modern mind. Another work of the same order is M. Bisson's "La tristesse de la Vierge," and were the Mother and Son less ugly, the picture would be more interesting. But the subject is original: the Virgin is seated under a tree; Our Lord is at her feet gazing up at his mother's sad face; His back is turned, and so He does not see the vision of His Crucifixion, which causes His mother's sadness—it is the "sword which shall pierce her own soul."

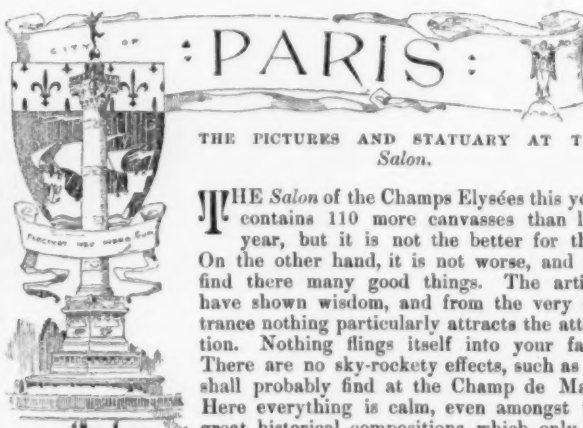
M. Clairin has two very startling portraits of Sara the divine as Cleopatra, and of Mme. Caron as Salammbo—gorgeous in color, both of them, as regards the costumes—but not at all satisfactory as regards the flesh tints; Sara is decidedly dirty. M. Morot's "Retraite de Saint Jean-d'Acre," represents the great general walking at the head of his troops (the horses being required for the wounded) thus setting the example of self-sacrifice; though why this should be so commendable in those who alone reap the glories of warfare, it is hard to see. The figure of Napoleon is too tall but the sense of heat, of physical weariness and mental depression is well expressed; not only in the commander, but in the movement of the soldiers. Still, this picture falls far below the painter's beautiful and powerful "Portrait of M —."

It would take the whole of this number of the *American Architect* to discourse upon the marvellous quantity of still-life pictures. MM. Bail, Beyle, Monginot and Rouby are all in good form, as the young people say—somewhat disagreeably, but the latter's management of silver spoons, pewter pots, brass saucepans and a copper fountain is worthy of attentive study by students. The groups of landscapists of sunny climes, MM. Montenard, Olive, Allègre and Gagliardini, are stronger than ever in their power of painting intense sunlight; the latter's pictures seem to be palette scrapings of the most brilliant hues, put on with the knife, but resulting in gorgeous effects of sunlight.

There are as usual an enormous number of superb landscapes: many of the new Impressionist School, among which the "Matinée" of M. Vuillefroy reigns supreme: it is a charming idyl—just a girl and a cow under a tree, but bathed in sun and poetry. MM. Petitjean, Thiollot, Simonet, Vauthier, Sain, Sheard, Picknell and Poitevin, are also fine as ever. "La cinquantaine;—les noces d'or" is a charming picture. An old couple sit, half-dreaming, before a very ascetic meal, laid out in front of the cottage door; they are pensive and passive, but the spectator is allowed to read their thoughts, which are of the olden time when they were spooning at the cottage gate—he a young sailor, she a pretty maiden. This is portrayed in a misty vision in the distance. There is a good deal of this mysticism this year by the symbolist school of dreamers and followers of the modern Rosicrucians; on the other hand, there seems to be little or no comedy, unless M. Buland's "Flagrant délit," may be considered as such—but it is the very serious comedy of the divorce court. It is a marvellous study of expression, all the same.

Each year that the split goes on, the old *Salon* gets weaker and weaker; how can it be otherwise, when more than half the best men exhibit in the Champ de Mars? M. Bouguereau is *démodé*, and all his followers ditto, and the *atelier* Julian, although an excellent school, is not quite strong enough to feed such an enormous number of rooms with good work. Reconciliation has been attempted, but to no end; and so we are compelled to walk miles and miles, while we weed out the wheat from the tares, which latter, certainly these last years of '92 and '93, predominate to an enormous degree. A word of praise ought to be given to a promising portrait by Mme. F. Vallet; and perhaps the work which impresses itself as much as any upon our memory is M. Vollon's charming "Pierrot," a most masterly study in white.

S. BEALE.



THE PICTURES AND STATUARY AT THE Salon.

THE *Salon* of the Champs Elysées this year contains 110 more canvasses than last year, but it is not the better for this. On the other hand, it is not worse, and we find there many good things. The artists have shown wisdom, and from the very entrance nothing particularly attracts the attention. Nothing flings itself into your face. There are no sky-rocket effects, such as we shall probably find at the Champ de Mars. Here everything is calm, even amongst the great historical compositions, which only impress us by their dimensions. Nevertheless, the "Charles the Rash," by Roybet, is not wanting in movement. Having forced the doors of the Church at Nesles, where the people have taken refuge, he enters the very choir on horseback, and is present at the massacre of the crowd by his men—"ses bons bouchers," as he called them—and the fact is that we ourselves seem to assist at a veritable

butchery. The soldiers are cutting throats on every side, both of women and children. Mounted into the galleries of the choir, they pitch their victims over the balusters. It is an atrocious *mêlée*, and over the scene reigns a confusion that the artist could not attenuate. The interest is rather scattered over the whole canvas, and Charles himself does not sufficiently attract the eye. He, on the other hand, appears to be attracted by two women in the foreground, who introduce a little light into the too great sombreness.

One of them, clad in a robe of light blue, a shimmering stuff, pleads as she clasps her infant in her arms. The other, with bosom half uncovered, clad in a costume of gold and yellow, kneels before Charles. In this portion of the painting there are portions which are handled in a masterly manner; but the *ensemble* is unsatisfactory because of the blacks and forced shadows, which make it too obscure. M. Roybet ought to give a thought to these defects, for when last year he exhibited some of his works in a private gallery, he took the care to illuminate it in a special manner, and inundated it with light, while leaving the spectator in a state of comparative obscurity. M. Roybet, nevertheless, achieves this year an incontestable success; but it is with an altogether different canvas, one entitled "Propos Galants." A trumpeter, with rubicund visage, his large gray felt hat in his hand, wrapped in a green mantle and shod with boots, is leaning on a table in a *cabaret*, behind which a large girl, strong of limb, is plucking poultry. Her bosom, ill-contained in its chemise of cotton, inspires in the happy-go-lucky soldier feelings which he is expressing with a certain vigor and dash, to judge by the satisfied expression of the two personages. This scene, which might be altogether vulgar, is rendered with a frank feeling and robust gayety which disguises its grossness. It is a joyous scene, composed and painted in a remarkable manner, and is one of the great successes of the exhibition.

The largest canvas is signed Munkacsy. It represents Arpad, the founder of the first Hungarian dynasty, receiving the submission of the vanquished tribes. Surrounded by the chiefs of his seven tribes, he receives, after the victory, the representatives of the great people, who bring him as symbols water from the Danube, handfuls of earth and of hay. This painting, all-attractive, appears calm and simple, while it reflects the grave feelings of the Slavic people. One could find a little fault with the too great uniformity of its general aspect and the extraordinary neatness of the costumes worn by people who must have lacked the aid of brushes. At any rate, when it shall be placed in the palace of the Hungarian Parliament, for which it is destined, the work of M. Munkacsy will certainly produce a grand effect.

In the field of antique painting, rather than historical, M. Jean Paul Laurens has disclosed a feeling which he has concentrated in a canvas of quite small dimensions. The widow of the Vendean general, de Bonchamps, in prison and condemned to death, having been pardoned by the Convention, sends her seven-year-old daughter to demand the pardon papers of the revolutionary tribunal at Nantes. "Yes," said one of the judges, "on condition that you sing for us your prettiest song." The child, believing that she

is doing what was desired, begins to sing with full voice a Chouan song, the refrain of which is "Vive le Roi, à bas la République"; but so great ingenuousness disarms the tribunal, and the child bears away in triumph the writ of pardon to her mother. This episode, extracted from the memoirs of Madame de Bonchamps, has been dramatically though simply rendered by M. Jean Paul Laurens. The child, kneeling on a chair, gazes at her terrible yet gravely attentive auditors. Perhaps the conclusion of this scene cannot be sufficiently foreseen by the aspect of these grim visages, which hardly seem to indicate the working of tender sentiments.

In another painting, the same artist shows us St. John Chrysostom hurling imprecations from his pulpit upon Queen Eudoxia, whose crimes he condemns, and who listens impassively standing within a round-arched loggia decorated with Byzantine mosaic-work. The scene lacks space, but not character.

Rochegrosse, whose immense painting at the exhibition of 1891 may be remembered, returns this year with two smaller subjects, which allow him to study his details with minute care. He exhibits this year the "The Pillage of a Gallo-Roman Villa by the Huns." A group of these barbarians are looking curiously at two of their comrades as

they carry away a woman into a garden, which stretches out before a Pompeian portico. On the other side, a man, his wife and a woman are kneeling, apparently in expectation of immediate death. It is an interesting painting, and one in which no detail has been sacrificed. But what is this painting about which the crowd collects, laughing and talking with one another? Between their heads I at length discover a kettle, then two kettles, then, on a chair, a cook's assistant in his white apron and red waistcoat, leaning back with his hands in his pockets and his legs outstretched, while a cigarette hangs between his lips. It is called "The Finished Task," and is signed Joseph Bail. Rather an extraordinary subject, you will say. That is true enough, but there is about this painting a feeling and ability which can hardly be imagined. This little scullion is alive, and, as to his task, it has, in truth, been well done. One must see these kettles by M. Bail to understand to what degree of finish one can arrive in the painting of kettles. It is sheer perfection. The over-particular pretend that this is not art; that this is mere *trompe d'œil*. They affirm that it is too skilfully done. The painting of kettles may be something quite else. It is an art which, perhaps, is lacking in sentiment and originality, but, pushed to such a degree as this, it is true art. At any rate, this picture is a great success.

Amongst the rather decorative compositions, I will mention that of M. Bourgonnier, intended for the Salle des Mariages de la Mairie de Montreuil-sous-Bois, and representing the "Summer of Life." M. Bourgonnier belongs to the modern and realistic school. He seeks out humble subjects. Here a workman is breakfasting on the terrace of a little hillside which overlooks the town, whose factory chimney-tops can be seen in the distance. Before returning to his work, he consecrates a few moments to the pleasures of family life. His wife is beside him, and both of them bestow their smiles upon their little baby, while two elder children are playing about a short distance



"Propos Galants": by F. Roybet. From *L'Illustration*.



"St. Jean Chrysostome": by J. P. Laurens. From *L'Illustration*.

away. The bluish tonality of the painting is a little misty, and so is hardly fitted for an exhibition, but, when in place, I should not be at all surprised if it appeared admirably amidst its architectural surroundings.

M. Lamy also indulges in blue, and it is a blue without disguise. In the landscape which he paints for this year, his naked women promenade in the midst of blue woods, and the blue sward is sown with blue flowers. Naturally, this has its influence on these unfortunate women, who also become blue. The title of this work is "The Land of Flowers."

Much attention has been attracted by the painting of M. Henri Eugène Delacroix, styled "The Struggle of Life." "The strong species destroy the feeble species," says Darwin, and M. Delacroix has embodied this cruel idea, and shows us, in a boat adrift on the sea, strong men hurling their weaker fellows into the water. They are also casting in the greater part of the women, which proves that people in a boat do not do that which they do in a tramway, where they generally yield their places to the women. There are some good bits in this painting which would make a fine show-piece in a museum, and would be instantly copied by admirers of the nude.

Mr. Alma-Tadema usually draws his subjects from antiquity. He is a fine carver of Greeks and Romans. His exedras, porticos, marble columns, vellums, togas, are caressed with delicate and minutely graceful brush-strokes, but this perfection is very often tiresome. Heliogabalus used to love at the end of a repast to shower his guests with a rain of flowers until they were stifled, he himself dominating the spectacle, naturally, and sitting impassive while his guests smothered before him. On the day selected by Mr. Alma-Tadema for us to be present at this real imperial fantasy Heliogabalus caused it to rain roses. Many guests have already fallen, and through the petals which cover the *convives* appear their disquieted countenances, still endeavoring to smile at a pleasantry which, nevertheless, they begin to find very inconvenient. These heads are well studied and finely rendered, but the flowers lack lightness. Each rose-leaf has almost the same value as the next, and, being detailed with the same care, the *ensemble* forms a solid and equal mass.

I cannot pass over the name of Bouguereau which we come upon every year under his women and his Cupids. On a little antique pedestal a standing Cupid receives the offerings of several young girls and shows his preference for the apple. Impeccable in his drawing M. Bouguereau is always irritatingly precise and proper in his painting.

Genre painting is very well represented this year and we find a number of canvases that are interesting and amusing without being vulgar. M. Buland has made rather a specialty of the heads of peasants and the lower classes and he here exhibits two paintings the most interesting of which is certainly the one styled "Flagrant délit." Awaiting their turn to take the witness-stand, three persons are seated on a bench, a young villager, a young girl and between them the *garde champêtre* who caught them in the act; the latter is calm and severe while the young peasant with fixed and stony gaze seems to take the situation in a philosophical way, but the young girl seems to be affected with disquietude or at least *ennui*. One can guess, however, that everything will come out all right. The types have been carefully studied, skilfully caught and have an amusing truthfulness of expression.

M. Tito Lessi shows two pretty little pictures in the manner of Meissonier: in one of them a young prince unbuckles himself at the salutation of his lord's courtiers and cardinals — there always must be a cardinal, through need of a bit of red. In the other, Galileo receives a visit from Milton, to whom he is showing a fine map of the world while the latter listens attentively. These figures are painted with great care and their brilliant costumes are detailed with great minuteness.

François Flameng has sent a painting that has had much notice, "C'est lui." "Lui" is Napoleon I, asleep in a chair in a peasant's hut beside a table which still bears the remains of a simple meal — a scene supposed to transpire in France in 1814. The emperor seems

broken down with fatigue, and two of his staff stand silently apart from him, while a group of peasants gaze curiously upon him and one can see that they will preserve the memory of the visit so long as life lasts.

The modern school affects simple subjects and tries to express the emotion and feelings encountered in daily life. Every one does not succeed in this attempt as does M. Jean Geoffroy. His "Prière des Humbles," in spite of its sorrowful atmosphere, is not lacking in real grandeur. In a rather darkened corner of a church some poor women are standing or kneeling at prayer. One feels that they are in search of a moment's peace and comfort. A pretty effect of soft light throws into charming effect a kneeling woman in the foreground.

A strong sensation is produced by M. Vayson's painting "The Shepherdess's Offering" which rather belongs to the class of landscape: In the midst of a field a shepherdess is seated at the foot of a little ruined calvary upon which she has laid a little bouquet of flowers; as she watches her sheep she busily knits away while the last rays of the setting sun softly caress the charming scene. From our contemplation of this picture we are rudely awakened by catching sight of M. Tattegrain's canvas which shows a scene of the utmost confusion, and with good reason, for the village is all afire — fortunately in the daytime. Men are vigorously fighting the flames

while with difficulty they hold their places on the thatch-covered roofs. In the street, frightened women and children weep beside the scanty heaps of furniture that has been saved. Although there is abundant movement in the scene it wakens no emotion in the beholder.

M. Outin with his two pictures achieves a real success: In one, a diligence is slowly crawling up a hill while the passengers, partly to relieve the horses and partly to limber-up their stiffened legs, have got down to walk. One of the men, clad in the style of 1830, is giving a sou to a beggar-boy, another group listens to the pleading of an old trooper while a young couple, a little apart from the rest, are plucking

flowers at the side of the road and looking out over a ravishing landscape. The whole picture is flooded with sunshine. In the second picture the artist is more sentimental: Manon Lescaut here has come to seek the Chevalier des Grieux in the Seminary of St. Sulpice and the presence and supplications of his mistress have cast the young seminarist into great distress of mind. The emotions of the two have been so cleverly portrayed that the picture is one of the most interesting of the collection.

Alas, too many artists (but are they really artists?) find it necessary to win attention by treating commonplace subjects at a colossal scale. One of these, M. Salle, has felt impelled to paint, life-size, a locomotive-engineer leaning from his cab in alarm at some obstruction on the rail. Such a subject ought to excite emotion, but the eye is mainly



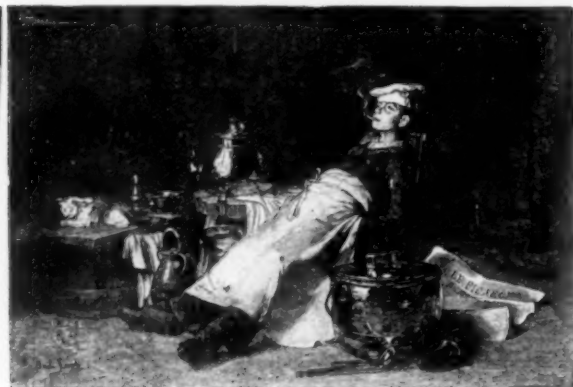
"Pillage d'une Villa Gallo-romaine par les Huns": by G. Rochegrosse. From *L'Illustration*.



"Un Soir à Nazareth": by Paul Leroy. From *L'Illustration*.

drawn to the details of the engine, or rather of the tender which is really all that is seen. The effect is rather laughable than exciting.

As usual there are many portraits and landscapes and the greater number are interesting. In these two fields the French School of Painting has undeniable merit. Among the most notable portraits I will mention those of Bonnat, who exhibits the portrait of his mother, done in a broad and energetic manner. M. Bonnat has in



"La Besogne faite": by J. Bail. From *L'Illustration*.

too great a degree that which Bouguereau lacks and his talent is less suited to painting female than male portraits. On the other hand M. Henner gives to his female figures a softness of expression that is altogether charming. With a portrait of a young girl he exhibits a nude reclining figure called "Dormeuse" which is truly enchanting, but one must examine from a distance. M. Henner advises his pupils that to grasp and understand the masses of a figure it is necessary to half close the eyes and then paint what they see. The artist perhaps has the habit of closing his own eyes a little too much, for in this figure here the feet are scarcely drawn at all, they being almost formless.

I have already spoken of M. Flameng's fine portrait of a lady, and M. Blanchard exhibits a very living portrait which has a strong resemblance to M. Got of the Comedie Francaise and M. Benjamin-Constant has discovered in "Lady Helen Vincent" a model who lends herself gracefully to a study in the antique: a Wingless-Victory in her hand, seated upon a sort of throne and draped in a robe girdled at the waist, Lady Helen Vincent shows herself radiant with youth and beauty. This portrait, warm in color, clear and harmonious in tone is delightful. In proportion as the palette of M. Benjamin-Constant is clarified and becomes more luminous, so that of M. Clairin becomes murky and complicated. His portrait of Mme. Caron of the Opera, in the rôle of Salammbô, is absolutely bad; the artist in his search for that which is strange has evolved that which is horrible—one would think it the portrait of a mad woman. On the other hand, the likeness of Mme. Sarah Bernhardt, in spite of its theatrical pretentiousness, is far more agreeable.

It is difficult to speak here of the landscapes; it may be enough to say that the exhibition includes many fine ones, and that in the first rank we are tempted to place M. Quignon. The landscapists of to-day do not search out extraordinary scenes and complicated effects; their pictures are composed quite on Nature's own models and they have learned to interest us in the simplest scenes. A field of ripening grass is enough for them as is the case with M. Quignon. M. Wührer on the other hand, more ambitious, exhibits a remarkable mountain view, and M. Français, the dean, still holds his place amongst his younger fellows. The best painter of Oriental scenes that we have is, perhaps, M. Bompard, while the one whose palette holds the most resplendent colors is M. Gagliardini—but if I were to omit no one worthy of mention I should give merely a list of names. I must not, however, slight the American exhibitors. There are more than fifty of these and so I can only make my selection from their work.

Mr. Smith-Lewis occupies a large space, far too large considering the subject, which would have gained through being treated with more restraint; this painting represents the "Beach at Dinard." It is an enormous sketch ("pochade") a painting done "à l'emporte-pièce," which recalls some of Manet's good sketches. Mr. Bacon, of Boston, exhibits a pretty "Goose-girl," fresh in treatment, but unhappily his geese are very wooden; while otherwise the effect is charming. Mr. Walter Gay, also of Boston, merits less restricted praise. His painting entitled "The Pardon" is full of feeling; it is one of the numberless Breton scenes at the Salon, but one of the best of them all. Amongst other Bostonians I will mention Mr. Pearce, whose "Shepherd's Daughter" is charming in its poetical sentiment; Mr. Smith who paints his reapers in high relief and whose sheafs are too stiff; and finally, Mr. Picknell, who exhibits two fine landscapes, "In Provence" and "In California," the latter representing a road winding through a plain at the foot of a mountain range; a burning sunshine lights the scene and gives the

impression of a suffocating heat. It is a curious and interesting painting.

Just as for painting, I will mention of the 972 entries in the catalogue under sculpture only those works that are worthy. French sculpture evidently occupies a superior place. Each year it seems to have made progress and become more interesting. It is an art which, unlike painting, cannot neglect form and drawing. Artistic education is indispensable for sculptors, and cannot be replaced by simple instinct and vulgar originality, which in painting give birth to a number of little societies of little power but of much grotesqueness. The first piece of sculpture which draws attention is signed Falguière, and, as usual, occupies the place of honor reserved for this artist. I will say at once that his "Heroic Poetry" this year will add nothing to his glory, and is not one of his best works. This figure, proudly poised with a lyre in her hand chanting with full voice a patriotic song, seems marching to the combat, and certainly invites one to follow her. She is naked, like the sculptor's usual goddesses, the lines of whose head and upper body he preserves, as they are of admirable beauty; but, as always, the feet are too flat, and a bit of drapery falling between the legs makes a fold which, in my opinion, injures the lower portion of this marble statue.

I unreservedly admire the two exhibits of M. Barrias, and I should give the preference to "Architecture," a marble statue intended for the tomb of the architect Guerinot. A young woman is seated or rather stretched in her abandonment upon an entablature ornamented with a mediæval frieze. The graceful folds of her long robe allow one to divine a supple and elegant form, and from the whole figure exhales a profound sentiment of grief which has been obtained without dramatic exaggeration. The other composition represents "Nature, mysterious and veiled, uncovering herself before Science." The superb woman who symbolizes Nature, and shows herself in all her beauty, does so with a simple gesture, which makes of this fine statue a real bit of grand art.

"The Meadow and Rivulet," by M. Larche, is a graceful work, inspired with exquisite sentiment. Exhibited in plaster at the Salon of 1891, it returns this year in marble, more beautiful and more graceful than before. The meadow, represented by a young girl, tries to restrain a rivulet, which, in the guise of a young lad, runs before her; but he seeks to escape from her like a little savage, indifferent to innocent caresses and fraternal kisses which are offered to him, and hurries to resume his vagabond course. In this group there is an impression of youth, grace and adorable innocence, and it is one of the most marked successes of the exhibition.

M. Peenne deserves all praise for his "Madeleine au Réveil." The celebrated sinner seated, her legs bent under her, stretches herself languorously. It is perfection itself, both for the model and for the artist.

There is another group which, exhibited in plaster in 1890, appears here in marble. It is the "Lutteurs" of M. Charpentier. Two men, in all the vigor and force of their age, are wrestling: one of them is held face down by his adversary, who is trying to force his shoulders to the ground. Nearly vanquished, the under man stiffens his muscles, and resists vigorously. In this group there is an energy of action which curiously contrasts with the plaster statue "Les Hirondelles," exhibited by the same sculptor. In the latter everything is graceful and charming—a pretty female figure, which seems on the point of flying away, is surrounded by swallows, which have settled upon her.

In the matter of pretty things I will mention another very fine statuette by M. Boucher, which represents "Diana Surprised."

Amongst the American sculptors, Mr. Clarke has attracted notice with his "Pressoir." The fault I find with this work is that he gives too great prominence to the accessories. No detail of the press is neglected, and it was not necessary to do this in order to express the effort of the man who alone is the real subject of interest in the work. Apropos of this figure, a critics asks if next year we are going to see an engine-driver upon a real engine.

This is already too long an article, and I have not yet spoken of architecture. The reason of this is that this year it is also represented at the Salon at the Champ de Mars, where a new attempt has been made, and it will be interesting to compare the two exhibits in a special letter, which I will send later.

THE TUDORS AND ART.



HE sudden transition which painting experienced in England, from the state of high esteem in which the favor of Henry VIII maintained it, to the neglect into which it sunk immediately after his death, in consequence of the proscriptions issued against the greater part of its works, is the most important circumstance in the history of English art.

That monarch, finding the period in which he reigned distinguished by the fame of the great Italian and German painters, had endeavored to attract the most celebrated masters of their art into his kingdom. He invited to his court Raphael, Titian and Holbein, the last of whom became a resident in London. Although unable to prevail with the former two, he still persisted in his favor towards them, and procured from Raphael the picture of St. George, afterwards possessed by the King of Spain, and from Titian two pictures

afterwards in the Stafford Gallery. Holbein was lodged in his palace and employed in various historical works. It appears also that, like the other sovereigns of his time, Henry was desirous of calling into action the utilities of the art, for we find in Walpole's "*Anecdotes of Holbein*" that "he invented patterns for goldsmiths' work for enamellers and chasers of plate, arts much countenanced by Henry VIII," and that he made also "designs for weapons, hilts, ornaments, scabbards, sheaths, sword-belts, buttons and hooks, girdles, hatbands, and clasps for shoes, knives, forks, salt-cellars and vases, all for the king."

When ecclesiastical reform was instituted Henry appears in all his acts to endeavor carefully to separate the legitimate respect for statues and painting in churches from unauthorized regard towards them. His sentiments with regard to the admission and use of statues and pictures in churches are fully expressed in his first injunctions, as head of the Church of England, in 1538, and in a publication called "*A Necessary Doctrine and Erudition for any Christen Man, set furthe by the Kynges Majestie of England*" (printed in May, 1543).

The following passages there occur in the exposition of the Second Commandment, wherein a full direction is given for setting up images in churches "to be as bokes for unlearned people to put them in remembrance of those sayntes, of whom they may learne exaumples of fayth, humilitie, charitie, pacience, temperaunce, and of all other theyr virtues and gyftes of God. As for an exaumples, the image of our Saviour hangeth on the crosse in the roode, or is paynted on clothes, walles, or wyndowes, as an open boke, to the intent that besydes the exaumples of virtues, which we may learn of Chryste, we may be also many wayes provoked to remember his paynefull and cruell passion, and also to consider ourselves, when we beholde the same image, and to condemne, and abhorre our synne, which was the cause of his so cruell death." His letter to Cranmer, in 1542, is to the same effect.

In conformity with these sentiments, Henry continued to the last to protect the works of art in the churches from the indiscriminate zeal of the reformers; but the rein having once been given to iconoclastic fury, it could not lightly be checked, and in the beginning of the reign of Edward VI a letter of the Protector and Lords of Council addressed to the same Archbishop of Canterbury runs thus:—"Considering therefore that almost in no place of this realm is any sure quietness, but where all images be clean taken away and pulled down already, etc., we have thought good to signifie unto you his Highness's pleasure, with the advice and consent of us the Lord Protector and the rest of the Councell, that immediately on the sight hereof you shall not only give order that all the images remaining in any church or chapel within your diocese be removed and taken away, but also by your letters signifie unto the rest of the bishops within our province, this, his Highness's pleasure for the like order, to be given to them," etc.

Nor was even this strict charge thought sufficient. It was followed by a statute in 1549, in which is the following article:—"And be it further enacted, by the authority aforesaid, that if any person or persons, of what estate, degree or condition soever he, she or they be, body politick or corporate, that now have or hereafter shall have in his, her or their custody, any books or writings of the sorts aforesaid, or any image of stone, timber, alabaster or earth, graven, carved or painted, which heretofore have been taken out of any church or chapel, or yet stand in any church or chapel, and do not, before the last day of June next ensuing, deface and destroy, or cause to be defaced and destroyed, the same images and every of them, and deliver or cause to be delivered, all and every the same books, etc., to the mayor, etc., etc., shall, after the said last day of June (being thereof lawfully convict) forfeit and lose to the King our Sovereign Lord, for the first offence xxs., and for the second offence shall forfeit and lose (being thereof lawfully convict) ivl., and for the third offence shall suffer imprisonment at the King's will."

To these acts of prohibition succeeded in 1559 an "Injunction given by the Queene's Majestie, as well to the clergy as to the laitie in this realme, in the fyrst yeare of our Sovereigne Lady Queene Elizabeth," two articles of which run thus:—"Also that they shall take awaye, utterly extyncte and destroy all shrynes, coveringe of shrynes, all tables, candlestykes, tryndalles and rolles of waxe, pictures, payntinges and all other monuments of fayned miracles and superstycion, so that there remaine no memorie of the same, in walles, glasses, wyndowes or elsewhere within their churches and houses," etc. "Item, that no persons kepe in their houses any abused images, table, pictures, payntinges and other monuments of fayned miracles, pilgrimages, ydolatri or superstycion."

In the convocation held by the archbishops in the thirteenth of the same reign, among other canons, this for taking down and defacing pictures and images was one. The canon (eighteenth) runs:—"That the churchwardens shall see the church kept clean; the Holy Bible to be in the churches; and the holy homilies, lately set forth against rebellion; and all rood-lofts, wooden crosses, pictures of false and feigned miracles, and all other relics of superstition destroyed and demolished; the walls of the churches to be new-whited, and sentences of Holy Scripture to be written upon them in great letters."

The exercise of this power in the hands of churchwardens, during a time of religious controversies may be easily imagined. The charge of new-whiting the churches was a sweeping commission that left no

compromise. The homily against idolatry had also particular reference to the pictures on the walls of churches.

Nor was the practice of destruction confined to the above-mentioned depositaries of religious judgment. "In the Queen's time," says the Attorney-General, in a State trial, 8 Car. I, "many went abroad, of their own heads, to break down crosses, images and pictures of all sorts." This violence proceeded to such excess that a proclamation became at length necessary, stating that:—"Whereas many violent persons have of late, of their own authority, gone about to deface the walls and glass windows of churches; and in their violence have pulled down tombs and monuments of noblemen and gentlemen deceased, to their dishonour and to the breach of our peace; therefore a strict commandment is given, that all men forbear to break the pictures set upon tombs or graves, and not to break the pictures or portraiture of the noblemen or others in churches, church-walls, windows, etc., nor any images whatsoever, without the advice of the ordinary, or the advice of the Queen's Majesty, or her Council," etc. Given 44 Eliz.

The Queen's proclamation, although it might suppress particular violences and regulate the actions of men of rational opinions, did not abate the popular prejudices against the unfortunate arts of design. "I undertake," says a witness at the same trial, "there are some spirits now, that, if they had been alive in Solomon's time, would have gone nigh to have done violence to the cherubims. God knows what would have become of them."—(State Trials. Proceedings against Henry Sherfield, Esq., for breaking a painted church window. 8 Car. I, 1632.) Under such persecution the arts were not able to maintain their ground. Their professors sunk into poverty. One amateur named Hillier expressed himself about their condition in this way. "If a man be so induced by nature, and live in time of trouble, and under a government wherein arts be not esteemed, and himself of but small means, woe be unto him, as unto an untimely birth, for of mine own knowledge it hath made men poorer, as amongst many others, the most rare English drawer of story works." It is probable that few adventurers were found to supply their places, and the field was, therefore, left open to the occasional speculations of foreign artists.—*The Architect.*



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE GERMANIA MAENNERCHOR, NORTH CLARK ST., CHICAGO, ILL. MR. AUGUST FIEDLER, ARCHITECT, CHICAGO, ILL.

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

GARDENER'S COTTAGE FOR MR. CHARLES SOOYSMYTH, GREENS FARMS, CONN. MESSRS. JARDINE, KENT & JARDINE, ARCHITECTS, NEW YORK, N. Y.

HOUSE AT BANGOR, ME. MESSRS. COOK, HAPGOOD & CO., ARCHITECTS, HARTFORD, CONN.

CHAPEL OF THE CHARITY HOSPITAL, LILLE, FRANCE. M. MORCOU, ARCHITECT.

GRACE CHURCH CHAPEL, WEST PHILADELPHIA, PA. MR. ROBERT A. PITTS, ARCHITECT, PHILADELPHIA, PA.

SKETCH FOR A STABLE. MESSRS. DOCKSTADER & CONSIDINE, ARCHITECTS, ELMIRA, N. Y.

PRELIMINARY DRAWING FOR THE METHODIST PROTESTANT CHURCH, PITTSBURGH, PA. MESSRS. BARTBERGER & EAST, ARCHITECTS, PITTSBURGH, PA.

HOUSE AT NEWPORT, R. I. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

PROPOSED RESTORATION OF THE FONTAINE DE JEANNE D'ARC, ROUEN, FRANCE.

[Copper-plate Etching.]

THE City of Rouen had, between the end of the War of One Hundred Years and the foundation of Havre, an era of uncommon prosperity which favored the development of the arts in an unusual degree. In the first place, in the fifteenth century, the churches were restored and enriched. Then the palaces and the dwelling-houses were rebuilt with luxury and elegance, and finally municipal

works were added to these embellishments, and public places were decorated with sumptuous fountains. Two schools of artists, the first still belonging to the Gothic school and their successors, distinct partisans of the Renaissance, were formed and exercised their talents in these multiple works, struggling in rivalry of taste and ingenuity. Why was it necessary that they should have yielded to the attractiveness of a material easy to work, and why should their caprices have made them partially forget the laws of construction? The fine carvings on the easily-worked stone of the façade of the Cathedral of Rouen and the Hôtel Bourgtheroulde are already eaten by the weather; the fountain at Lisieux is nothing but a formless and time-worn mass of ruins; while the Fountain of Jeanne d'Arc, already much deteriorated three-quarters of a century after its construction, was, in 1755, destroyed by the order of the municipal authorities, more preoccupied in getting it out of the way than careful of its artistic and historical value.

Fortunately, the taste for works of art was not lost, and never will be lost wholly in the capital of Normandy. For proof, I only desire the masterly restoration which M. Foucher, Jr., a Rouenese sculptor, has recently made of this fountain, while his father caused the fountain at Lisieux to live again in a gracious model. These two works were almost contemporary. The fountain at Lisieux represented Parnassus, with its divinities and its poetic pastoral scenes, a singular conception and quite foreign to the domain of architecture, a naïve toy, painting to the life its epoch, and which lasted only as long as dreams last even when translated in stone. Quite other was the Fountain of Jeanne d'Arc. Its author not less original, not less devoted to the forms of the Renaissance, nevertheless knew how to make the most of national traditions. From them he borrowed the structure of his monument like the thought he expresses. Both one and the other are clear, and the impression which the silhouette affords is as happy as the idea is popular. Like the most noble fountains of the Middle Ages, this one is composed of two superposed basins, the upper one forming a reservoir, from which distributing-pipes discharge the water into the lower basin, surrounded by a well-curb. This basin used to be used for washing, and the gargoyles for filling pails.

The architectural data are derived from tradition. The fountains of the Middle Ages all had a central pyramid crowned with a cross or a statue; and the chapel or lantern of the dead at Avioth (Meuse), a structure of another kind, which dates from the fifteenth century, shows the same architectural motif. The columns support, on a polygonal architrave, a little lantern crowned with a pyramid. A miniature in the "*Heures du Duc de Berri*," a fifteenth-century manuscript, which forms part of the collection of the Duc d'Aumale, shows us in the midst of a terrestrial paradise a Gothic fountain of large size. Like that which now concerns us, it consists of a basin sheltered under a canopy formed of three retreating stories, with little pinnacles about the upper lantern, and the columns which support this structure are set about the circumference of the basin.

In spite of these analogies, each of the details of the Fountain of Jeanne d'Arc belongs to the purest Renaissance, and the plan is original in its triangular form. This plan, however, is not without another example in the sixteenth century. The latter exists at Autun in the Fontaine St. Ladre, which bears the date of 1543, and is in like manner crowned with a dome-covered lantern. The Fountain of Jeanne d'Arc replaced, about 1530, the cross which must have been set up in memory of the rehabilitation of Jeanne on the spot where she suffered punishment. The researches of the Rouenese archaeologists seem to have shown that the cross was really planted on a neighboring spot, and that the fountain occupies a third site. It was on the Marché Vieux that the fatal fire was built. The structure which now concerns us was situated on the Marché aux Veaux, later the Place de la Pucelle. An examination by expert engineers in fact demonstrated, in 1505, that the water of the spring of St. Filleul could there mount six feet and a half higher than it could on the Marché Vieux.

The plate annexed to this article presents the restoration which M. Foucher, Jr., has made in the spirit of real artist and yet scrupulous historian. It is in the spirit of the most exacting criticism that he has gathered, considered and interpreted a whole series of written and figured documents, and his method of work deserves to be applauded and recommended, as an excellent and too rare example, to the attention of those who restore historical monuments. The figured documents are some engravings by Israel Sylvestre and the painting attributed to Le Barbier, the elder. The written documents consist of a *procès verbal*, drawn up in 1604, by Pierre Hardouin, master-painter and sculptor, entrusted with the giving of advice as to the restorations worthy of undertaking, and also a description prepared in 1828 by Charles du Lys in a book consecrated to the Maid.

The structures shown in the etching behind the fountain are also restorations made in accordance with other precise documents. The edifice at the corner of the Place is nothing other than the exterior façade of the Hôtel Bourgtheroulde in its primitive state. The angle tower fell down in 1830, but a drawing made in June, 1825, was published by Pugin, and M. Foucher, in 1856, made a restoration of this façade. The neighboring houses are presented after indications contained in the engraving of Israel Sylvestre.

The Fountain of Jeanne d'Arc was erected about 1530, but the name of its architect is unknown. The structure, 11½ or 12 metres high, consisted of a circular basin surrounded by three columns, of

which the bases formed a portion of the curb of the basin, and which supported the angles of a triangular reservoir. In the centre of this reservoir was placed a lantern of the same form, composed of a stylobate and three colonnettes in the form of balusters, which carried a canopy with architrave surmounted by pediments. The statue of Jeanne d'Arc was sheltered in this little structure. Upon the angles of the reservoir rested three other colonnettes having the form of candelabra, bearing the figures of Judith, Esther and Deborah, each bearing her peculiar attribute and guarding the modern heroine. The canopy above the latter was in turn surmounted by another and last lantern, formed of three distaff-balusters supporting a little hemispherical dome, surmounted in its turn by a circular architrave. Upon this rests a little cylindrical pedestal bearing a crowning feature, which was destroyed earlier than 1604. About this topmost lantern, which sheltered a figure of the Virgin, stood three other statues, supported on the angles of the dais which surmounted the figure of Jeanne d'Arc. Between the supports of the statues of Esther, Judith and Deborah, the frieze which formed the rim of the reservoir was surmounted with ornaments, in open stone-work, representing sirens supporting the coats-of-arms of France, Normandy and Rouen. Beneath the reservoir three stems of lead-work turned into the form of the letter S supported themselves upon the rim of the lower basin, resting against the bases of the columns, and were gathered together around a pipe which connected the bottom of the upper reservoir with the tops of these S-shaped features, whose upper portions were fashioned into the form of unicorns' heads, and from which the water was discharged into the lower basin. These leaden spouts, which Hardouin designates under the name of "*cul-de-lampe*," were bronzed. The same author calls the supports of the six exterior statues "*ouvrages appelés de poterie*." One might believe that he thus designated faience, which was manufactured at Rouen as early as the sixteenth century. But his description, giving an account of the restorations made upon the statues, shows that they were of stone, and the term which he applied to them probably indicates that their form was sufficiently like those of the caraffes and awns of terra-cotta, rather than the actual material of these supports. This same description indicates that at this date, 1604, the three capitals were entirely defaced and the crowning feature had disappeared.

All the statues had suffered greatly, and Hardouin was not able to identify those on the upper part of the structure. On the other hand, he points out the existence of the sirens supporting the escutcheons and pediments or lanterns, portions which had disappeared when the graphic illustrations were made. M. Foucher has in a general way been well inspired in his restorations of these bits. He has re-established the capitals after the capital of the same epoch preserved in the Museum at Rouen, and coming from the Church of St. Martin-sur-Renelle. As for the sirens, he found on a chimneypiece in the Rue des Maillots at Rouen and at Paris in the Chamber of Henri II at the Musée de Cluny motifs which exactly corresponded with the descriptions of Hardouin. The latter did not identify the statues which surrounded the lantern of the Virgin; but, after having recognized two of the lowermost ones as the prudish Biblical women, Jael and Judith, he adds, "and to all others in sequence." These words are not applicable to a single statue, but indicate that Pierre Hardouin saw prudish women in all the others. He also believed that he saw the remains of a statue in the crowning feature of the structure. M. Foucher, however, has grouped about the statue St. Michael, St. Catherine and St. Margaret. He was right, for even admitting that the sixteenth-century artists placed there three out of the nine famous women, or, as M. Georges du Bose supposes, the three Virtues, his idea is the better one. One could hardly comprehend a triumph of Jeanne d'Arc from which should be absent the personages she saw in her vision. The heroines who surrounded Jeanne d'Arc are those whom the Middle Ages called the three famous women of the Old Testament. [The nine noble men and the nine noble women were the three principal male and female heroic personages of antiquity, of the Biblical period and of Christianity.] To these classic figures, continually reproduced in our monuments, popular acclaim sometimes added a tenth famous man, Du Guesclin, and a tenth famous woman, Jeanne d'Arc. The Renaissance had gathered together the traditions of the Middle Ages. The paintings in the Hôtel de Ville at Hondschoote, near Dunkirk, which appear to date from the time of Henri IV, represent the nine noble women, and amongst them Jeanne d'Arc, and so has a curious relationship with the monument at Rouen. In opposition to the idea of Hardouin, but in agreement with Charles du Lys, M. Foucher has crowned his restoration with a cross. He may be right, for it is a cross that the monument has replaced.

Another fountain at Rouen terminates with a cross, and the "Well of Moses," at Dijon, was surmounted with a calvary, while the grand Renaissance fountain called the Fontaine d'Amboise, at Clermont-Ferrand, is crowned with a Hercules. The fountains at Terton, at Puy-en-Velay, and a sixteenth-century fountain at Béziers, likewise seem to have carried a statue on their truncated pinnacles. The fountain in the fish-market at Basle carries above its finials a metal-work angel. Figures of angels, especially that of St. Michael, were very frequently placed at the summits of spires during the Middle Ages and the Renaissance. The true place for St. Michael was, therefore, perhaps at the summit of this structure. On the Fountain of St. Ladre at Autun, a pelican occupies this place. Other fountains, as at Viterbo, of the thirteenth and fourteenth centuries,

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and at Puy-en-Velay, have the central pinnacle terminating with a flowering finial. Finally, this finial was sometimes replaced by a pinnacle in "poterie," as Hardouin calls it, as may be seen in the choir at St. Pierre at Caen, another masterpiece of Norman Renaissance.

All these hypotheses are admissible, and although the cross is less probable it is not wholly inadmissible. But why should it have three arms? The triangular arrangement of the structure does not justify this anomaly, for a cross whose arms do not continue in the same line is no longer a cross, but an arbitrary ornament. If it is allowable to restore arbitrary arrangements, it is so only in the case where it is proved that they formerly existed. The restoration with much probability supposes that the under side of the reservoir was ornamented in caissons, the design for which was borrowed from the ceilings of St. Jacques at Dieppe, belonging to the same epoch and to the same style and school. In sum, M. Foucher has re-established scrupulously and with real artistic talent all that could be learned of the monument, and for the rest he has suggested restorations that are probable and intelligible. He has, moreover, guarded against erroneous suggestions furnished by former restorations, which gave to the fountain two circular stages, and placed Jeanne d'Arc on her knees before Charles VII. It is greatly to be desired that all our historical monuments might be as ably restored, and it is greatly to be wished that the City of Rouen should feel herself bound to restore in accordance with this model one of the most interesting relics of its own history and that of France.

FIFTEENTH-CENTURY LOCKS AND SIXTEENTH-CENTURY KNOCKER.

[Copper-plate Photogravure.]

THESE articles form part of the famous Spitzer Collection now being sold in Paris.

HOUSE AT BROXBOURNE, ENG.

THE house shown in the illustration was recently erected by Mr. J. A. Hunt, of Hoddesdon, from the designs of Messrs. Newman, & Newman, F. R. I. B. A., of Tooley Street, London Bridge.

RESIDENCE AT MOSELEY, NEAR BIRMINGHAM, ENG.

THIS residence has recently been erected at the corner of Wake Green Road and Grove Avenue, Mosley, from the designs and under the superintendence of Messrs. Essex, Nicol & Goodwin, architects, of Birmingham and London. The buildings are faced with best pressed red bricks and Bath-stone dressings, and are covered with brindled tiles.

THE NEW INN, GLOUCESTER, ENG.



[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.]

QUESTIONS FROM CHICAGO.

CHICAGO, ILL., May 22, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—1. In the central business portion of this city are many high buildings. If, as I understand, these rest on a comparatively thin layer of hard-pan over fathomless mud, why does not this small and heavily-loaded area settle somewhat, causing an upward-thrust elsewhere?

2. I have heard that the weight of piers in these high buildings is distributed by a large flat crib of steel beams locked together at right angles, and centering under the piers. But how is this done on lines of abutting property where the spreading-out can be done only on one side?

3. Is the new Art Institute on the lake-shore designed to take the place of the brownstone structure nearly opposite where the A. I. A. convened in '87? If so, for what will the latter building be used?

4. To what one person is due the credit of designing the general lay-out of the World's Fair grounds, the conception of the Court of Honor and the treatment of the lagoons?

5. What is the principle of the roof-construction of Machinery Hall? Why are the half-trusses pointed at the bottom? And why are the upper abutting ends rounded and so slightly joined? They barely seem to touch.

6. Staff is said to be water-proof and durable. If so, would it be a suitable house-covering in the Eastern States? Can you name any one east of New York who makes it?

Yours respectfully, F. F. D.

[1. It does and vertical dislocation is far from being uncommon. 2. See the *Engineering Record* of December 12, 1891, for an account of the building

of the foundations of the Rand & McNally Building. 3. Yes. 4. To Frederick Law Olmsted. 5. The roof of Machinery Building is supported upon half-arches tied and pivoted at the feet and meeting at the apex in a rocking joint which takes care of the expansion and contraction of the structure. 6. Staff can be made upon the job by any one. We question its stability in outdoor work in this climate unless thoroughly and frequently painted.—EDS. AMERICAN ARCHITECT.]



THE RECORD OF THE BROOKLYN BRIDGE.—The use of the Bridge by the public in the ten years since it was opened has far surpassed all the calculations of engineers and others in advance of the completion of the structure. The wisdom of the men who widened the Bridge so that room was afforded on the roadways for teams to pass each other, so that one slowly-moving load could not set the pace for all the traffic, has been amply vindicated, and the policy which raised the height of the trusses so that cars of standard size could be used instead of the squatty ones it was at first proposed to use has also been shown to be wise, and will be still further approved when electric elevated cars are run over the Bridge from the elevated roads at either end without change. The grip in use upon the Bridge cars, invented by one of the engineers, has been shown by the success attending its constant employment to be admirably adapted for the use to which it is put, the "life" of a cable being much more protracted than if the grip used with ordinary cable-cars were employed. The system of switching cars has proved successful for a far greater traffic than was ever expected it would be called upon to handle, and by the improvements soon to be made with new platforms and tracks on both sides of them, the facilities for travel will be doubled and twice as many passengers can be carried. In the ten years the receipts of the bridge from all sources have been about \$10,000,000. Of this about one-half has been spent in maintenance and the other half in improvements. The original cost of the structure was \$15,000,000, and the total cost up to the present time about \$20,000,000. There have been a total of about 280,000,000 passengers carried in the cars since the railroad was put in operation, the number increasing from 8,000,000 in 1884 to over 40,000,000 last year. The car-fare was five cents at first, but was reduced to half this sum a few years ago. Foot-passengers were originally charged a cent, and later one-fifth of a cent, but in 1891 the promenade was made free. Before that time about 3,000,000 people walked over the structure each year, and it is supposed that the number has been greater since, although no record can be kept, making a total of about 40,000,000 who have walked across the bridge. The earnings of the roadway from tolls, now only one-half of what they formerly were, are about \$80,000 a year. From car-fares over \$1,250,000 was received last year. The bridge was begun in 1870 and was thirteen years in construction. The towers are 278 feet high, and rest on foundations built upon caissons. The New York tower foundation is 78 feet below high water, and the foundations of the Brooklyn tower 45 feet. The centre of the bridge is 135 feet above high water, and at the towers the height is 110 feet. The cables contain 5,296 wires, each 3,578 feet long, and the cables are sixteen inches in diameter. They uphold 14,680 tons of permanent weight. The total length of the bridge, with extensions, is 6,537 feet, and the width 85 feet. The river-span is 1,596 feet, each land-span 930 feet, the New York approach 1,562 feet, and the Brooklyn approach 971 making the carriage-way 5,980 feet long.—N. Y. *Evening Post*.

CATALOGUE OF ANTIQUE CASTS ON SALE AT ATHENS.—A catalogue of the casts on sale in the National Museum at Athens has just been published in Greek, under the auspices of the Antiquities Department, and edited by Mr. Kabbadias. It should be of great service to all other European museums and also to the many universities, schools of art, etc., which are now forming museums of casts. All credit is due to Mr. Kabbadias for the promptness with which he has had all available new discoveries cast, e. g., those at the Heraeion of Nigoi and the sculptures by Damophon found at Lykosura. Epidauros, too, has received full attention. Hence the book serves, not only as a register of casts for commercial purposes, but also as a scientific guide to the recent additions to the Athenian collections, wherever the work of art in question has been already published a reference is added. Side by side with the catalogue of casts appears also the first volume of the catalogue of original marbles. Visitors in past years to Athens will remember that in 1886-1887 there appeared the beginning of such a catalogue, but so fundamental have been the changes, so frequent and extensive the additions to the National Museum, that Mr. Kabbadias has had to put in hand an entirely new work. The museum was completed in 1889, the bulk of the funds having been contributed by the wealthy Greek, Bernadakis, while the Government contributed 800,000 drachmas. The discoveries in the Acropolis are, of course, still kept distinct; as it is, the present catalogue describes 1,044 works of art, of which 125 are archaic. The book is supplied with an excellent plan, and with short introductory notice of the chief periods of Greek art. Another interesting feature is a history of the getting together of the collection, illustrated by a reproduction of the first MS. catalogue of the old collection of antiquities at Aegina.—*The Builder*.

EFFECT OF WALL COLORS ON LIGHTING.—The decorations of walls prove to have a very important influence upon gas bills. From recent figures by Dr. Sumpner it has been calculated that with different decorations a room would be equally lighted by the following candle-powers:—Black cloth, 100; dark-brown paper, 87; blue paper, 72; clean yellow paint, 60; clean wood, 60; dirty wood, 80; cartridge paper, 20; white-wash, 15. Only about one-sixth as much illumination is necessary for the whitewashed room as for the same room papered in dark brown.—*Invention*.

EFFECT OF WIND-CURRENTS ON HEATING.—Experiments with wind-currents in glass houses show that a room heated to seventy degrees in zero weather, with a still atmosphere, will be cooled twenty degrees in five minutes and forty-five seconds; the same room will be cooled twenty degrees in two minutes and thirty-five seconds when the wind is blowing at the rate of three miles an hour, and it will be cooled twenty degrees in forty-eight seconds when the wind is blowing at the rate of twenty-seven miles per hour:—and these figures, in view of the fact that it is a common occurrence for the wind to blow from twenty to thirty miles an hour, are cited to show the importance of carefully considering the number and size of windows and exposed walls before designing an apparatus for warming a building. It is further found that a granite wall eighteen inches thick will lose sixty-seven per cent more heat than a brick wall of the same thickness; a frame building, plastered on the inside and covered with paper, felt and sheathing on the outside, will lose seventy-five per cent less heat than a brick wall of the same thickness; a frame house, built without a paper felt covering on the outside will lose twenty-five per cent more heat than the same house if covered with felt. Again, it is demonstrated that one square foot of glass will lose as much heat as six square feet of twelve-inch brick wall. If closely-fitted double sashes are used seventy-five per cent less heat will be lost than with the single sash-arrangement.—*New York Sun.*

HOW THE CONDE MONUMENT WAS SAVED.—Whitewash is not always an evil thing. In the eighteenth century it was the means of preserving some remarkable examples of French sculpture. The great Condé, who always sought after grandeur in whatever was undertaken by him, erected a monument to his father, which exemplified the height attained by sculpture in the age of Louis Quatorze. When, at the close of the eighteenth century, the Revolutionists were struggling against Europe, there was a demand for cannon and many a work of art was sacrificed to obtain materials for casting them. The Condé monument was doomed. Some sympathizing friend of the family covered the statue with a thick coating of whitewash, and the Committee of Artillery, being probably in a hurry, came to the conclusion that the figures were only made of plaster and rejected them. They were then lodged in one of the musées until 1816, when they were returned to the family. The Duc d'Aumale, when they came into his possession, with the aid of M. Daumet, set them up in the chapel of the Château of Chantilly, where they guard the cenotaph in which the heart of the great Condé is mouldering. It is to be hoped that the statues will never be again reclaimed as war material, for the thickest whitewash could no longer deceive inquisitors.—*The Architect.*

THE USE OF WIRE-NETTING AT THE WORLD'S FAIR.—America is the land of storms, and the Chicago Exhibition buildings have been tested by them during the winter and spring. Less than a month ago there was a gale which, for forty-eight hours, advanced at the pace of sixty miles an hour. The buildings, however, withstood it very well. Strange to say the tendency of the glass was to fall outwards, and some of it even was blown back into the building. In order to protect visitors from injury by falling glass Mr. Burnham, the Director of Works, has decided to make use of 1,045,000 square feet, or about 24 acres, of wire netting, to be placed under the roofs of the four main buildings. The netting to be used will have a 2-inch mesh and consist of No. 18 wire. Tests were made with sheets of glass dropped 12 feet upon the netting without perceptible effect upon the screen. It is proposed, however, to place the netting only one foot below the glass. The amount of netting in the principal buildings will be:—Manufactures and Liberal Arts, 600,000 square feet; Machinery Hall, 170,000 square feet; Agriculture, 145,000 square feet; Fine Arts Building, 130,000 square feet. The arrangement is novel in exhibition buildings, but it is often employed in American railway stations.—*The Architect.*

A PUBLIC TOBACCO-SMOKE SUPPLY.—Says a French paper: "In the United States the idea was recently suggested of manufacturing pure tobacco smoke like gas, and laying it on like gas in buildings of various sorts. If this idea were carried out, the air of hospitals, theatres, churches, law-courts, and sick-rooms would cease to be poisonous, and would become fragrant and exhilarating. The tobacco scent-bottle and the tobacco-meter would, between them, revolutionize everything connected with smoking. Filth, poisons and disease would be replaced by purity, cordials and health. Cigarettes, cigars and pipes would disappear. Smoke would supersede scent in Romish chapels and stuffiness in Protestant churches. Indignant ladies might even be found complaining that the pew, the opera-box or the railway-carriage was not pervaded enough by the deodorizer."—*New York Tribune.*

AN ARCHEOLOGICAL MAP OF ROME.—Professor Lanciani, the Roman archaeologist, has given up his place under the Government in the Department of Antiquities to accept a promotion in the University of Rome, and has thus secured the requisite leisure to prepare and finish his archaeological map and description of ancient and mediæval Rome. The labor of completing this task is enormous, because the materials necessary to be studied are scattered all over Europe. Professor Lanciani hopes to consult those in Paris, Lille, London, Windsor, Brussels and some other places this summer, and to bring back a fine series of unedited documents. He is much encouraged at the interest and support given to his work, especially his forthcoming archaeological map, in America, where he has many friends.—*N. Y. Tribune.*

TABLET TO COMMEMORATE BOSTON'S GREAT FIRE.—Permission has been obtained from the Treasury Department for the Bostonian Society to place a bronze tablet at the base of one of the pillars of the post-office, corner of Milk and Devonshire Streets, to read as follows:

"This tablet, placed here by the Bostonian Society, commemorates the great fire of November 9 and 10, 1872, which, beginning at the southeast corner of Summer and Kingston Streets, extended over an area of sixty acres, and destroyed within the business centre of the

city property to the value of upward \$70,000,000 and was arrested in its northeasterly progress at this point. The mutilated stones of this building also record this event."

The tablet will probably be placed in position at once.

EFFECT OF COLOR ON SUNSTROKE.—An Indian gazette gives an account of the protective effect of certain colors against the sun's rays. It is urged that no one has ever been a victim to sunstroke or sun fever through a dark source of heat. It is said it is not the heat rays which act injuriously, but the chemical ones. As a photographer treats his plates by enveloping them in yellow or red, so, a correspondent says, he treated his body. All the linings of his hats and coats were yellow, with the satisfactory result that after a trial of five years, even often under circumstances of extreme exposure, there was no return of either fever or sunstroke, to both of which the writer declares himself to have previously been a victim.—*Invention.*

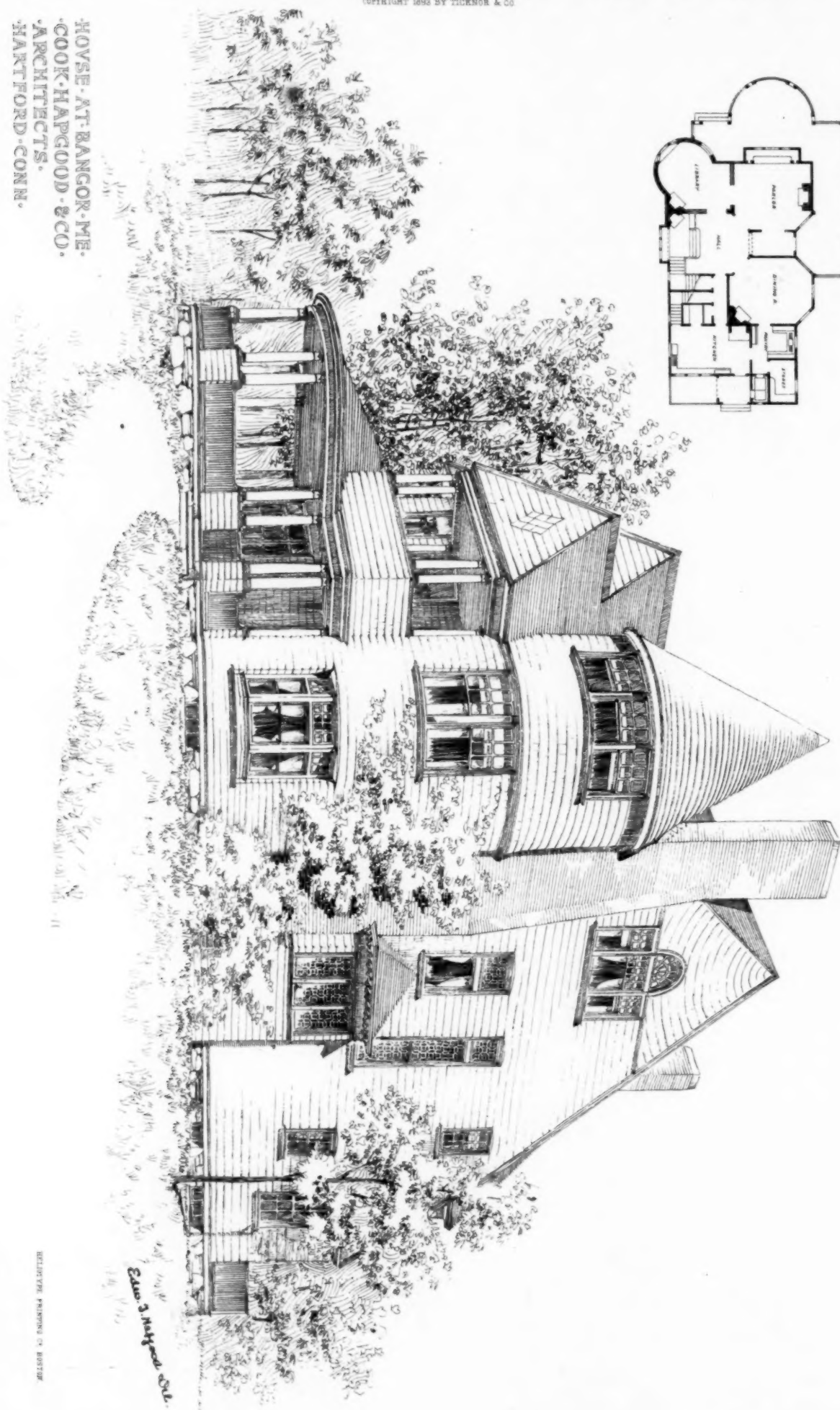
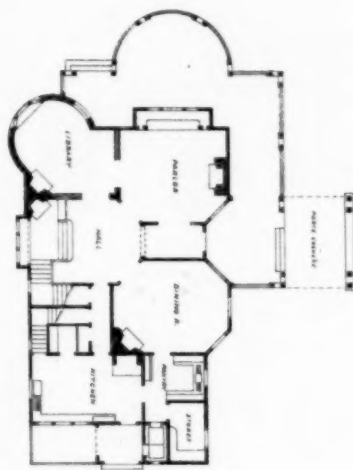
USE OF CHLORIDE OF CALCIUM TO PREVENT FREEZING.—At the last meeting of Dutch Gas Managers, during a discussion about chloride of calcium as a means of preventing freezing of meters, Heer Neurdenburg stated that he had had, in Leyden, about 300 meters filled with a solution of neutral chloride of calcium of 18 degrees Baumé, and that in eight or nine months they had suffered no damage. Heer van Eyndhoven, however, said that chloride of calcium was objectionable: he had put a piece of meter-metal in the neutral chloride of calcium solution, and found that it was attacked, while chloride of tin was present in the liquid.—*Invention.*



EVIDENCES of a reaction in the business world on both sides of the Atlantic are not wanting, but a careful scrutiny of all the recent developments do not warrant the statement that the improvement is of a fundamental character. Business men are apprehensive, discontented—in fact, intensely annoyed at the outside obstructions to an enlarged and more profitable trade. Those who are familiar with the actual condition of business sentiment on the existing depression, as this sentiment is expressed in business offices, do not need to be told that there is a good deal of disgust expressed, though it is not particularly pointed. Things are wrong, and business men do not know exactly who to blame or what effective remedy to suggest. They read of easier money markets, and then derisively smile at the statement, recalling their yesterday's failure to obtain desired bank accommodations. So far as industrial conditions are concerned, they have been advanced one notch during the week, but this is due to the fact that very conservative buying has been done for some time past. It is chiefly among handlers of textile goods and hardware that there is anything like large stocks on hand among retailers throughout the country. Producing-capacity in both these branches has been considerably expanded, and prices have been worked down to almost dangerous margins. It is to be noted, however, that the evil of long credits is being put under reasonable control, though it is by no means under absolute control. Buyers, retailers, do not care so much for long credits as they did, are better able to pay on short dates than they have been, so that this long-standing evil is curing itself gradually, of course, in an unexpected way. In all the hardware lines there is great activity, especially for building requirements and for farm improvements. This fact leads to the observation that the farming community is gradually getting onto stronger footing, and is diversifying crops more, or, rather, earnestly preparing to do so. One tendency which is not noticed in the daily press, but which has much significance, is that a great deal of land is being bought up in lots by persons intending to build, also that a great deal of Western land is being purchased by persons intending to farm. The importance of this statement consists in the tendency manifested, which is to a greater development of building and a greater development of agricultural interests. While money-lenders and speculators in stocks are in a fever, the great wealth-producers are expanding their operations and investing their earnings in productive channels. In the iron trade, prices have been fractionally advanced in some lines, as, for instance, pig-iron. To-day's probabilities point to a lock-out in over one hundred mills west of the Alleghenies. The workmen will probably be asked to accept a twenty-per-cent reduction. Their present rate of wages was fixed a quarter of a century ago, when iron was higher, and have never since been reduced in the forge departments, though the finishers accepted a reduction last year. It is doubtful whether the manufacturers could remain idle three or four months, because of the need of iron and steel and the absence of stocks. The demand for machinery and equipments of all kinds is increasing rather than diminishing. During the past week or two, large machinery-making establishments, including textile works, have secured quite extensive orders for new mills and for replacing old machinery. Makers of machinery say the requirements for the year are very large indeed, and surely denote an expansion of capacity in almost all lines of mechanical activity, especially in the finer lines, where instruments, fine tools and fine appliances of a hundred varieties are needed. The progress made in this direction is certainly pleasing, and most complimentary to American skill. There is no assurance of permanent financial improvement, and no assurance of a general expansion of orders for merchandise. Over sixty millions in gold have gone abroad, and the financial doctors keep soothing us that the worst is over. There is a large amount of what might be called withheld business because of the distrust. Liquidation is still going on, but it is the greatest error of judgment on the part of the moneyed interests to say that liquidation is what is needed. On the contrary, that which is needed is a greater volume of available money, not tied up in surplus reserves to read about, but a greater amount of money doing actual work—money which need not to take monthly or quarterly flying trips West, and then fly back to New York as though the Dalton gang were after it. We are told with great assurance, every few weeks, the flow of currency is again eastward, at which we are supposed to take much comfort. But it is right here that the defect exists. The money should stay West and work. Enterprise is warned against too great latitude at this time. In this hour of narrow margins, difficult collections and general economy, promoters and capitalists feel it necessary to proceed with unusually careful pace. At the same time, there is a great deal of new work. Railroad-building is starting up, and by the middle of July upwards of sixteen thousand men will be set to work on new roads in the West. Rail-makers report much increase in inquiry, especially for light rails.

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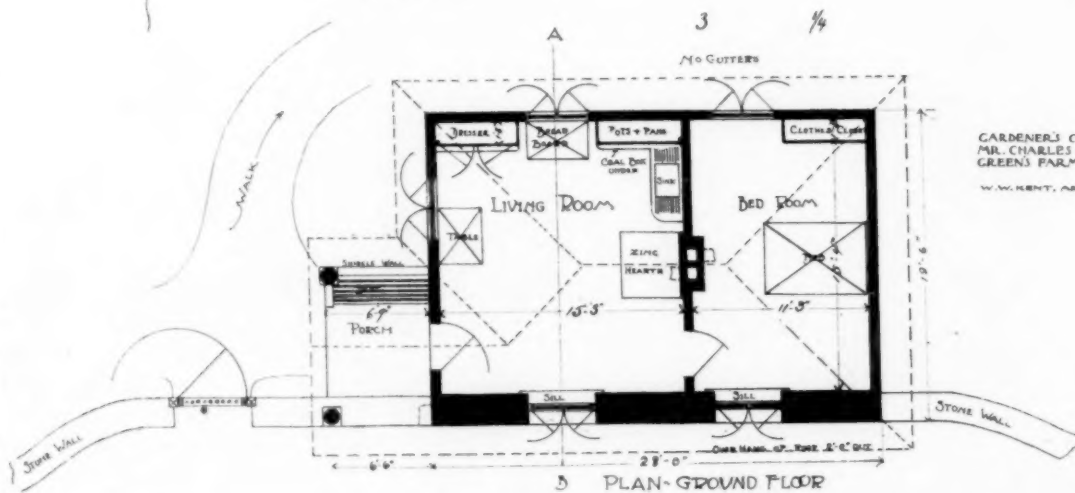
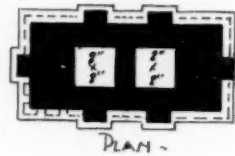
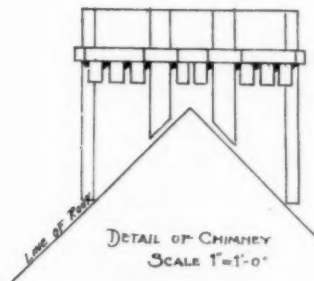
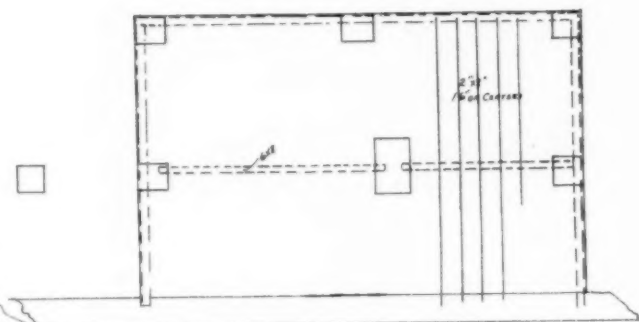
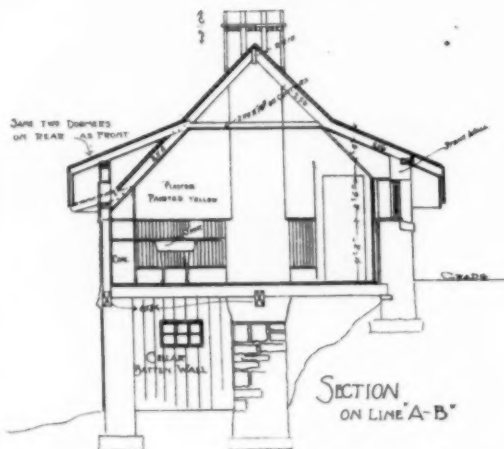
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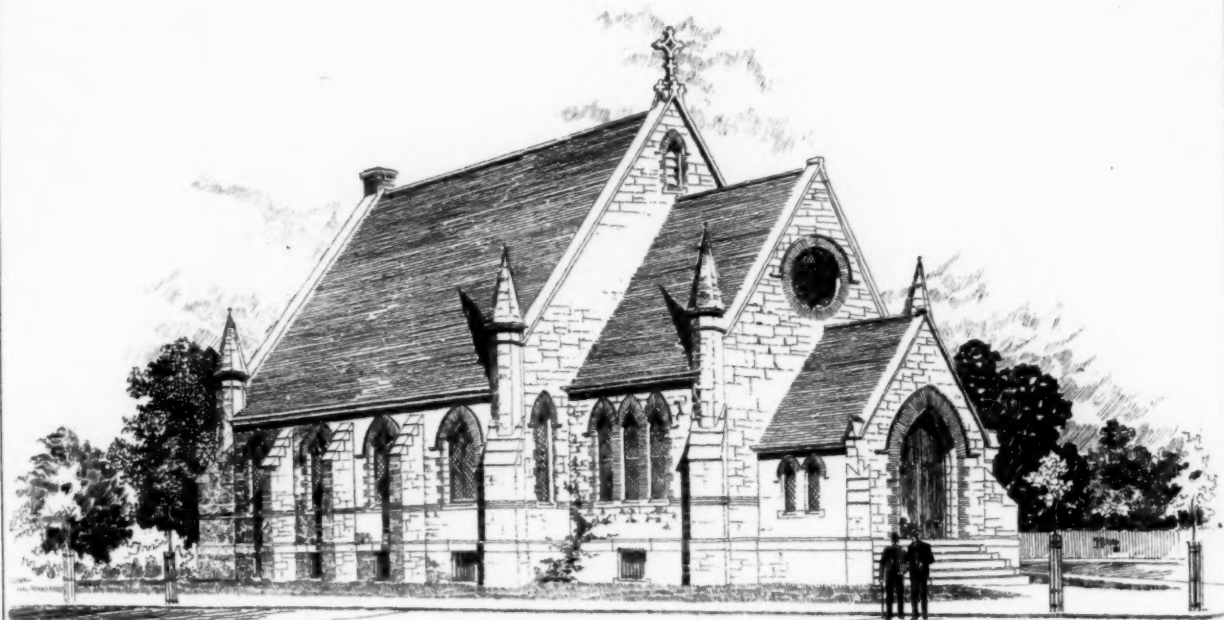
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