The Architect and Engineer
Of California

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Contents for November

Photo by Taber

MR. HENRY T. SCOTT

Head of the Union Iron Works, President of the Pacific Mutual Insurance Company, the Western Inspection Bureau and other prominent enterprises on the Pacific Coast.

The Architect and Engineer
Of California

VOL. III NOVEMBER, 1905 NO. 1

Architecture of Masonic and other Fraternal Buildings

By HENRY F. STARBUCK, Architect

SO many buildings for Masonic and other fraternal organizations have recently been built or planned that it becomes an interesting question to consider their relation to existing styles of architecture, and whether it is not a fact that such buildings, which are certainly unique in many respects, call for some architectural recognition, and demand a style of their own as much as churches, courthouses or school buildings.

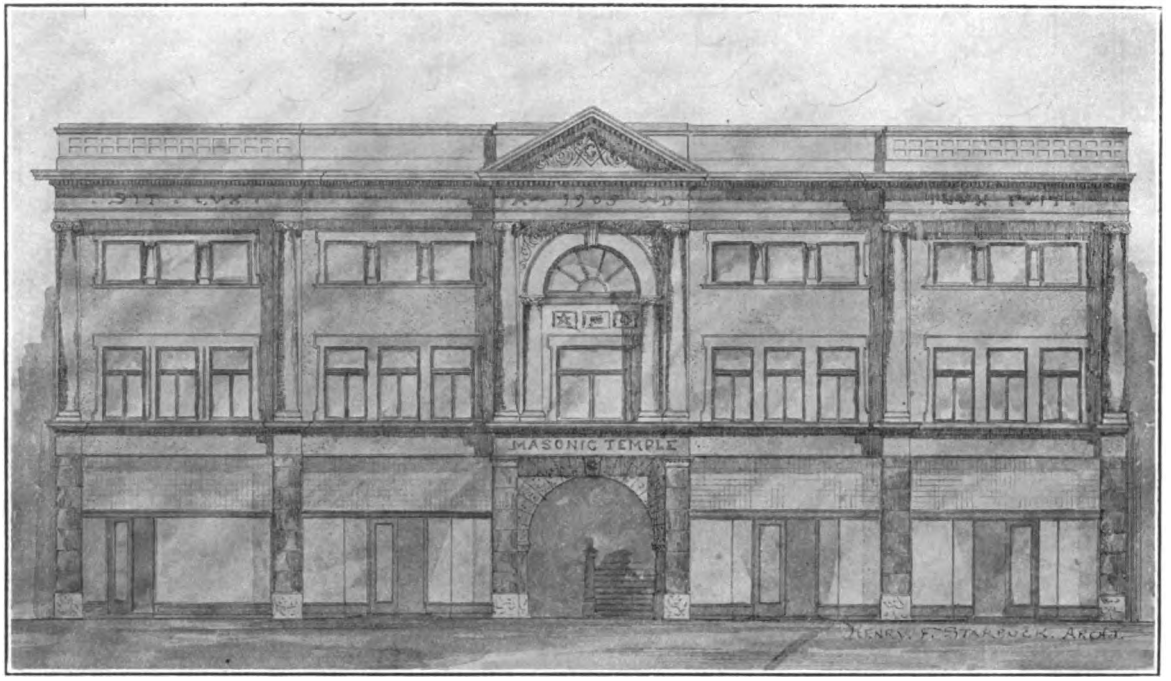
The building of halls for fraternal organizations is in such a primitive state that as yet nothing in the direction of an indigenous or characteristic architecture has been developed. With comparatively few exceptions, the halls which have been used for these bodies have, until very recently, been built without much regard to their use, in rented property, and wanting in everything specific or convenient for the purposes to which they were put. This was to be expected, for in most cases the organizations were small and weak, and in the earlier years of our country the demands of private life made the necessary contributions for these purposes small and uncertain.

In some of the large Eastern cities, however, buildings of note were erected, notably by the Masonic fraternity, with the Odd Fellows probably a close second. Few of these, however, show anything like a distinctive architectural character, and with few exceptions they were combined with commercial features in order to make them self-supporting, thus making it impossible to give anything but a mercantile character to the building.

As the prosperity of the country increased, however, the various bodies very naturally felt the influence of the growth in numbers and wealth, and in every direction we now hear of buildings being erected for the various fraternal organizations, some of which are well worthy of architectural criticism and study.

This very fact is perhaps an objectionable feature, for the growth has been too rapid to allow of sufficient study to invent anything like a new or adapted style, having distinctive character and individuality. The tendency has been, rather, to copy some existing models, or to fly off to absurd extremes of slavish symbolisms, such as, for instance, omitting windows on the north side of the building, because Solomon's Temple had none on that side, and many other similar notions carried out by those who consider themselves intelligent architects.

The writer recalls an instance where, the streets of the town running nearly diagonally to the points of the compass, it was suggested that the



Proposed Masonic Temple at Palo Alto — *Henry F. Starbuck, Architect.* C-195

lodge room should be built diagonally, that it might occupy the traditional east and west position.

Tradition is good in architecture, but it should be like an ornament—applied, not constructive. To be sure, putting a square and compass, or the three golden links on the front of a building will not give it any character architecturally. There must be feeling in the designer, and as before remarked, if the growth were slower, and more thoughtful care were given to the designing, we should, no doubt, develop a style in these several kinds of buildings which would be architectural in the true sense, which Gwilt so properly calls "fitness. It would be interesting to be able to compare the many buildings erected in the last few years to illustrate the rapid strides that this class of architecture has taken, but this article must deal with the idea, rather than the fact.

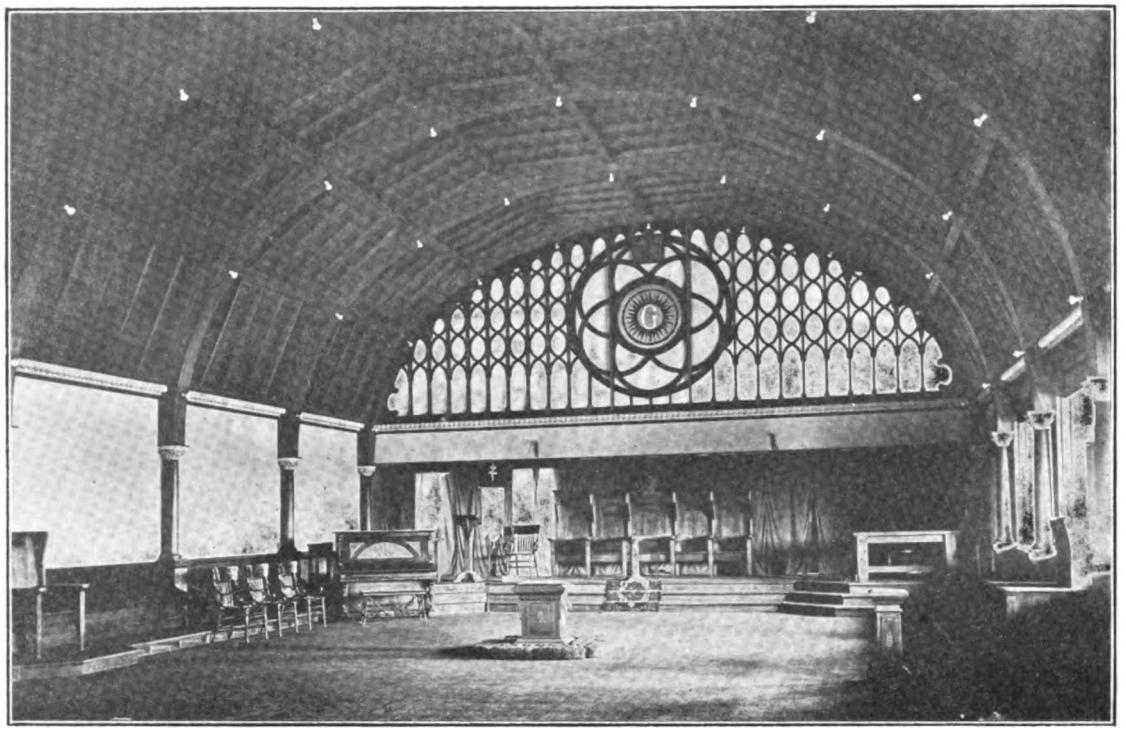
Masonic ritual, dealing as it does with architecture as a basis for almost all of its symbolism, naturally affords a better field for architectural study in its buildings, but as before remarked, as yet so few are erected without the commercial adjunct of stores or other business features that the architect has but little chance to display special ability in handling the subject, and it is truly refreshing to meet those in charge of such buildings who are willing to allow the architect to make the esthetical and symbolic character of the design superior to the mercantile. Little by little the minds of men are rising above the material, and intelligent thought is pervading even commercial design, and it is felt that we can afford a little concession to the artistic and esthetic.

Little by little we are getting away from the sordid "necessity" "motif," and allowing ourselves some latitude in design and construction, and we can confidently hope that we shall sooner or later see evolved a style that will be as clearly Masonic as the Gothic is ecclesiastical. To do this we must have, first, a full and careful understanding of the theory of Masonic ritual and ceremony. Merely to receive the degrees will not give this. The architects of the cathedrals were themselves believers and worshipers, and they wrought their belief into their handiwork.

No one man designed the cathedrals, and no one man can make a Masonic style. We must feel our way along paths that may be dim and obscure, but in the end there will result something worthy of our labor, and the end will be not any one man's idea, but the growth of many minds. Such a consummation is devoutly to be wished for.

We are writing as an architect, and not as a Mason, but there would be a lesson for all in a class of buildings so distinctive that it would not be necessary to put a square and compass on them to declare their purpose. It is true that in the case of secret organizations the uninitiated may not be aware of the peculiar features which dominate the order, yet as all are understood to stand for the great principle of Universal Brotherhood, there is a broad motive which can be expressed if there is any meaning in architectural feeling. We cannot expect every one to look at architecture with the mind of a Ruskin, but we can make architecture teach a lesson even so that he who runs may read. Charles Garnier said that if he designed a prison he would make it give out a lesson that would cause the criminal to hesitate in his crime; and so we can and should make our design to express fraternal love, hospitality, patriotism and devotion.

In designing buildings for fraternal organizations, much latitude is possible, but if the building can be confined strictly to the uses of the organization, as in the case of a church, it will certainly suggest some ideas which will give the thoughtful architect a motive upon which to build his design.



Section of Lodge Room, Masonic Temple, Palo Alto *Henry F. Starbuck, Architect*

Old and tried features he must certainly use, and his material will, in a large measure, determine his outline and detail, but the Seven Lamps will shed a willing light for those who seek it. It seems hard for the architect to apply these theoretical ideas to the design that is too often handicapped by the dollar motive, but it is for us to rise above this, if we are truly architects. No man is worthy of that name who cannot, in some degree, overcome the unfortunate conditions that surround him, and design something better than what has been done before.

So we look for something in this direction to be brought out of the multitude of ideas offered, and it is to be hoped that those who are interested in this class of buildings will see a great light and will remember that in the architecture of a Masonic Hall, or an Elk's Lodge, or a Pythian Castle, a lesson may be taught that will go far to accentuate the lessons of the ritual. How many even of those who have not deeply studied have felt the benign influence of a beautiful church edifice, or the inspiring or patriotic impression produced by an imposing public building. This is but a suggeston of the vast influence of good architecture, which is always instructive and educational.

To produce these results, therefore, we must have, first, the willing and generous ability of the promoting parties, whether it be the lodge or the committee or the individual. There should be an intelligent reliance on educated architectural skill and a firm determination to get the best available assistance of this kind, and such an architect should be allowed sufficient time to thoroughly study his subject, unhampered by mercenary or commercial motives.

Then there should be on the part of the architect a full appreciation of the purposes of the organization; something more than a mere acquaintance with the ritual; something beyond an imitative and slavish jumble of symbols; something deeper than a superficial copying of ideas, having only merit as applied to foreign subjects; something greater than an elaborate expenditure of money and material, suggesting only thoughts of cost and redolent with paint and prettiness.

Only with deep and fervent study can anything be evolved that will give a true and permanent character to this most interesting class of buildings, and that such a style will arise is as certain as that we have architects who feel what they do, and express what they feel.

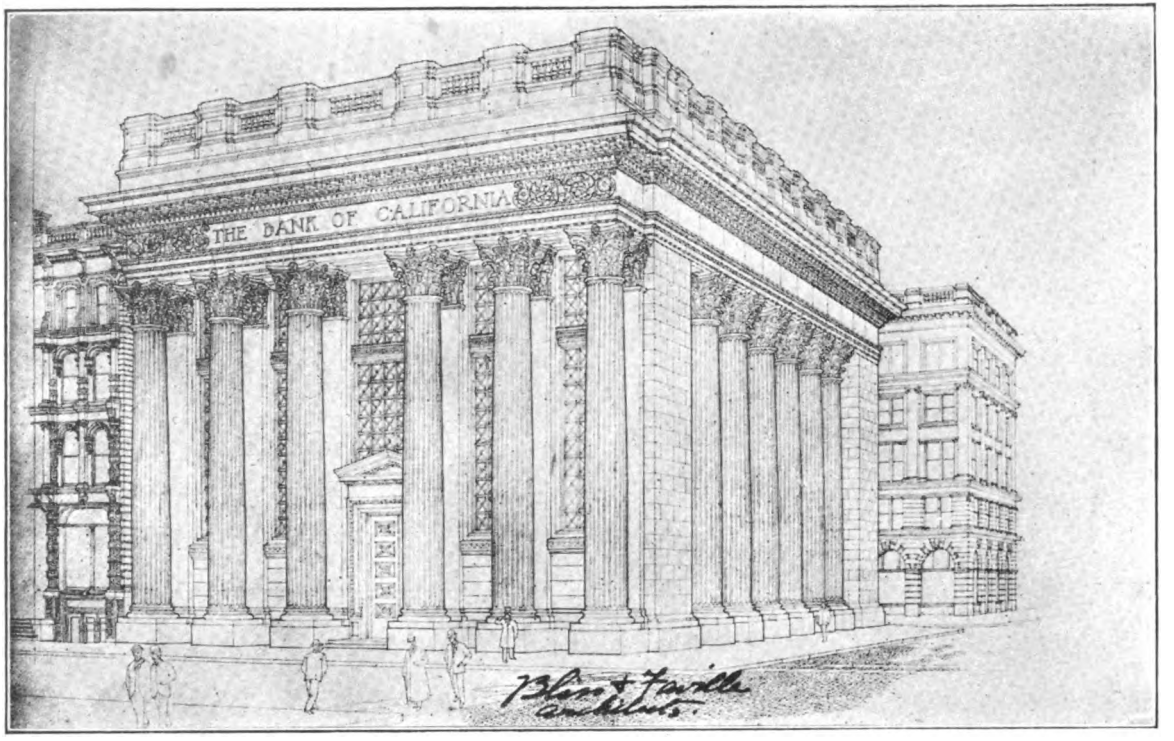
Residence of Eugene De Coulon *Sutton & Weeks, Architects.* C-197

Residence of Mr. W. P. A. Brewer, San Mateo *Sutton & Weeks, Architects.* C-198

Living Room, Residence of Mr. W. P. A. Brewer *Sutton & Weeks, Architects.* C-199

Residence of Capt. F. H. Lefavor *Sutton & Weeks, Architects.* C-200

Living Hall in Residence of Capt. F. H. Lefavor *Sutton & Weeks, Architects.* C-201



The Bank of California

Bliss & Faville, Architects. C-202

California Club's New Home

CLUBWOMEN are composed of three classes —those who think, those who try to think and those who think they think. And the California Club, by physical demonstration, has proved itself to be composed principally of the first two—and an almost imperceptible sprinkling of the last, but they don't count.

A few weeks ago the first woman's club house in Northern California— the home of the California Club, at 1720 Clay street—was dedicated to personal progress, to good fellowship and to public service. And it marked an era of development in woman's civic and social activities in San Francisco.

It was the official blessing of the hearthstone in the wine of good-fellowship, and every able-bodied club member of loyal heart was there to rejoice in the achievement of a two-years' dream —and incidentally of two years' good hard work.

Features of the building are the reception hall, in rich mahogany, and the auditorium, in white and gold. If simplicity without cheapness, harmony without faddism and utility without boorishness count for anything, then the building committee, the president and the club members and San Franciscans generally have every reason to be proud of the California Club House, its first woman's building.

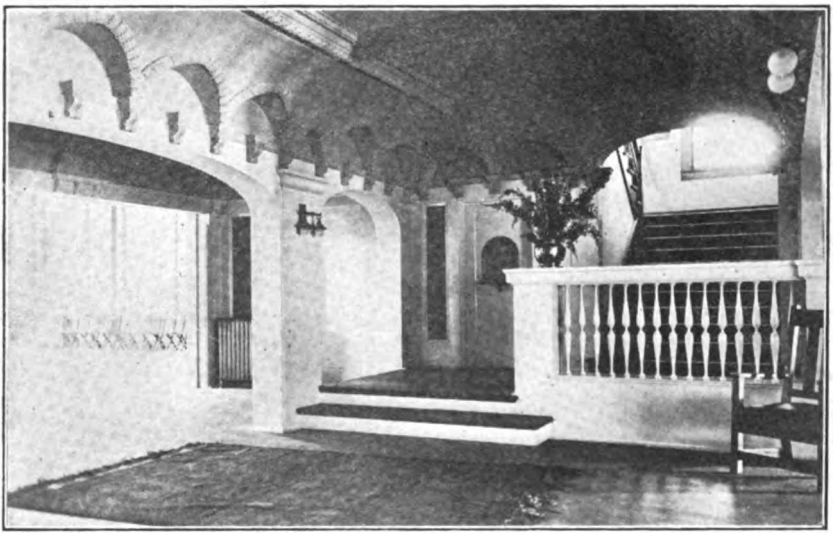
Already several clubs have secured the rentable rooms in the building, and thus has the clubhouse so soon become a nucleus for women's activities—for women who think, women who try to think—and an imperceptible few who think they think.

The club house is located at Clay street and Van Ness avenue, San Francisco, and is in the Spanish renaissance type of architecture, the exterior being plastered and having brick steps and an ornamental iron gate.

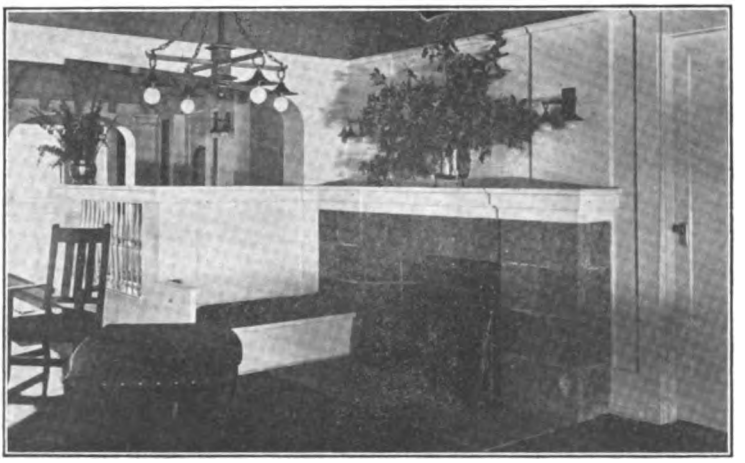
On the first floor are the general club rooms, the spacious reception hall and the auditorium. The club rooms are separated by paneled partitions hung on patent door hangers, so that they may be all thrown into one large apartment. The auditorium has a seating capacity of 750. The walls are plastered with a barrel vault ceiling.

The reception hall is treated in ornamental plastered ceiling, and the walls have plain, tapestried panels in old brown, gold and white. A feature of this room is the staircase, broken by landings, coming down by a large open fireplace and forming a cosy corner that is both pleasing and artistic. The fireplace is finished in Greube tiles.

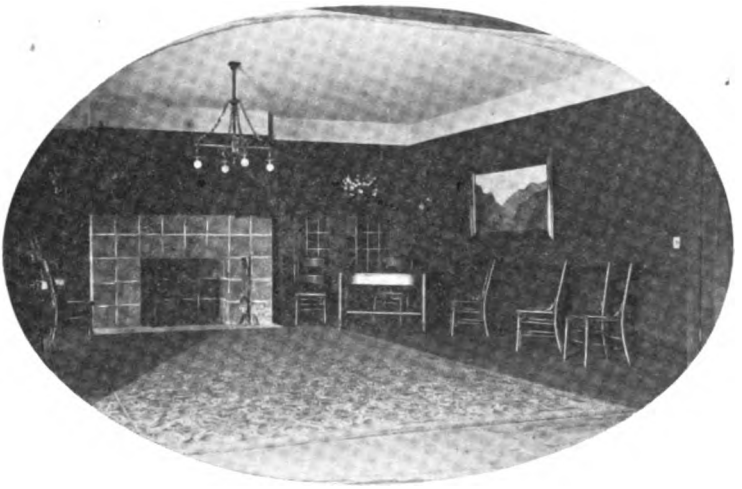
On the second floor are more club rooms and several dressing rooms, and on the third floor are the gymnasium, three rooms suitable for studios and bath and dressing rooms. The cost of the building, exclusive of the heating and ventilating, was $25,000.



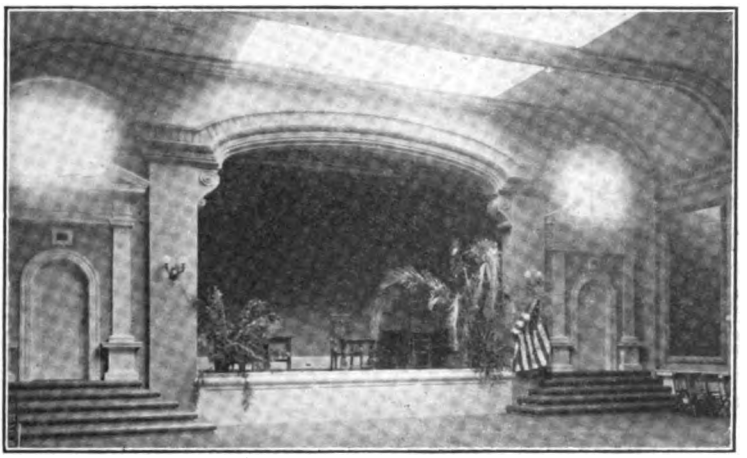
Staircase Hall of California Club Building *William Knowles, Architect.* C-203



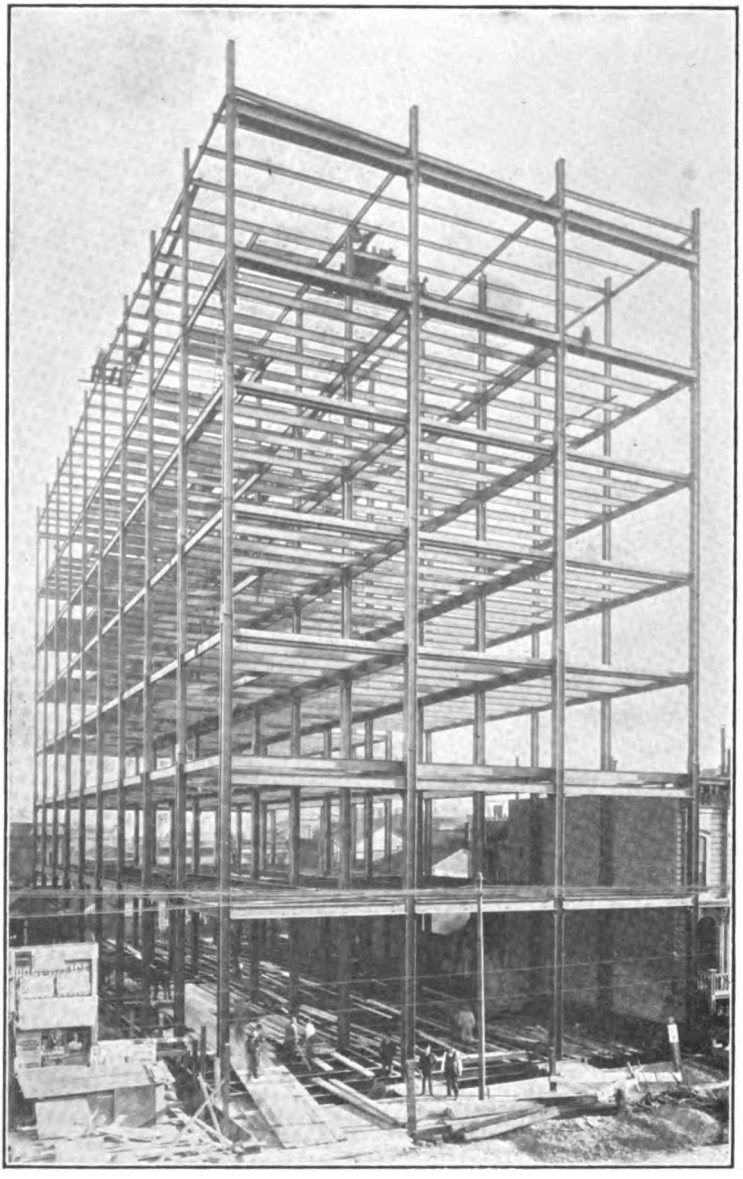
Cozy Corner of Staircase Hall, California Club *William Knowles, Architect.* C-204



Glimpse of One of the Club Rooms *William Knowles, Architect.* C-205



Main Hall California Club *William Knowles, Architect.* C-206
Painting and Decorating by W. W. Tucker.



Steel Frame of California Casket Co.'s Building

Albert Pissis, Architect. C-207
Ralston Iron Works, Contractors

Who Is to Blame for Destructive Fires?

An Architect's Obligation to His Client

THE recent fire in the San Francisco Chronicle building was the first practical demonstration of the value of fire-proof construction that we have had on the coast. The Chronicle building was the first office building of any size to be built on strictly fire-proof lines. From basement to roof fire resistive material was used, and in consequence the fierce blaze which swept through the tower on election night found very poor fuel upon which to feed after demolishing the tower.

The only regret of the owner of the building, Mr. M. H. De Young, is that the tower, too, had not been made fire-proof. But Mr. De Young will profit by experience, and when the new tower is built it will be in thorough harmony with the rest of the building, the materials that will be used being principally steel, brick and copper.

The question of who is to blame for destructive fires and just how far the architect is concerned is being discussed not a little in the East and is pertinent here on the coast at this time. Fire-proof Magazine, in a recent article, makes the following interesting comment, laying special stress upon the architect's obligation to his client in the matter of fire-proof construction:

"Safety should be made the first consideration in building. This is stated so often and accepted so universally as true that a re-statement of it sounds trite and commonplace. Like many other excellent fundamental truths, however, it is usually recognized and passed by without further thought. Sometimes it pays to think back to first principles and reconsider these old commonplace axioms.

"There is not much comparison between the rude stone hut of our long-gone savage ancestors and the modern buildings which we are erecting today, yet the leading intent of each is the same—the securing of a place in which to protect from the elements our property and persons. In both cases the prime consideration is exactly the same—protection from the elements. This is as much the intention of every building of today, from the three-room cottage to the twenty-story skyscraper, as it was of the aboriginal's cave.

"We have largely overcome under present day conditions the dreaded elements of wind and water which our forefathers had to battle with. Modern science has done this for us. Modern science in building has also, in a large degree, solved the question of immunity against the ravages of fire. The trouble is that not enough attention is paid to these methods of securing complete safety from fire.

"The architect of today is human like the rest of us. He wants to make a reputation and he wants his work to make as great a show in the world as possible. The prospective building owner is also ambitious to have his property show somewhat in advance of that of his neighbor, and it is an undoubted fact that a great deal of the terrific amount of destruction by fire in this country can be and should be charged to this desire of the architect and building owner to make a show—"to cut a dash." It is probable that until our architects have educated themselves to the fallacy of sacrificing safety to show they will continue to labor under present conditions.

"If by some psychological process the channels of thought of the architect and the building owner could be changed it is safe to say that in a very few years the terrible waste resulting from fire would be largely saved and the

question eliminated from our national economics. The materials, processes and methods are at hand (ready and clamoring for use) that make it possible to bring about an enormous reduction in our fire losses, but they are not used.

"The burden of responsibility for this rests largely upon the architect. When he and the building owner are educated to the realization that it does not pay to 'build to burn' these conditions will be overcome. The appeal to the pocket book is probably the only one that will produce the desired reform. The present procedure for a man, company or community wanting a building is to go to an architect and say: 'We want a building for such a purpose to cost a stated sum.'

"The architect prepares his plans with the knowledge that it is going to be pleasing to his client, or the contrary, according to the show which he can make to the eye for the amount of money upon which he is permitted to base his estimates.

"The owner has not educated himself upon the question of safety in building even to the point of knowing what he wants. We do not mean technical architectural education, but broad, commonsense ideas which a man should have in any enterprise he goes into and which he does have in almost everything except this 'Building Question.'

"The architect is also a slave to the question of making a showing of beauty, grandeur, artistic merit and similar questions. If he says to the prospective building owner: 'Why not have your building perfectly safe against fire as a first consideration?' the building owner either asks in reply: 'What do I make by it?' or, 'Can I save any insurance?'

"Yet it is a question whether the owners of buildings in this country are not becoming more educated on this subject than are the architects. They are learning from many channels that in building, as in human nature, 'beauty is only skin deep,' and that to be a good investment a building must first be safe from danger. They are learning this because they 'pay the piper'—when damage and destruction ensue as a result of unsafe building methods.

"At Springfield, Mass., a school building was recently planned and bid for by the contractors and the contract let for construction at $160,000. After arrangements had gone thus far the community asked: 'Is this building to be fireproof?' They found that it was not, and immediately raised a cry for fire-proof constructions. The plans were redrawn for fireproofing, and the contractor, who now, of course, had things entirely in his own hands, stated that he would make a fireproof and safe building for $20,000 additional, an increase of 12½ per cent.

"It would seem that in a school building in which over a thousand children were to spend the greater part of each day there could be no discussion as to the advantage of having a safe building, nevertheless, there was long and acrimonious discussion before the fireproof plan was finally adopted. The building has been erected, though it appears that it has a wooden instead of a fireproof roof.

"In the city of Baltimore, which recently had such a disastrous fire, a new high school building was planned, bids were taken on it and the contract let at a figure of $311,000. Again the people asked for a safe building, and the contractor, again with the matter in his own hands, put in a bid of $35,000 additional, an increase of 11 per cent. The authorities finally concluded to spend the additional money for a safe building, and the appropriation was made.

"The city solicitor, however, found certain legal technicalities in the way of this increased appropriation after the contract had been let, and the City of Baltimore, in all its majesty, wanting a fireproof building to house hundreds of its children, willing to spend the money to have it, and having

the money to spend, are now striving to find some way whereby they can get what they want! The matter has not yet been settled.

"At Ann Arbor, Mich., a high school building was planned to cost $250,000. Again the fireproof discussion arose under the same circumstances as in the two cases just cited, and an additional bid of $25,000 was made for a fireproof building, an increase of 10 per cent. After a referendum vote the citizens very foolishly, in our opinion, voted down the additional appropriation, and apparently the strongest argument that they could bring forth in justification of their action was that their other school buildings were not fireproof and had not burned. A very similar attitude this to that of a man who says: 'I sat in a draught yesterday and did not catch pneumonia, and I will now sit in a draught today.'

"Furthermore this vote was taken in the face of the reports of a destructive fire in a Philadelphia high school, a splendid fireproof building, with the exception of the roof and astronomical tower, which were of wood and were destroyed by fire with great destruction of valuable property, but luckily no loss of lives. The fireproof portion of the building; that is, the main structure, was safe and practically undamaged. Now the authorities of Philadelphia are preparing to reconstruct a wooden roof and a wooden tower on the same building and the public is making a strong complaint against this decision.

"Does this not demonstrate the obligation which the architect is under to his client to do something more in the preparation of his plans than merely to please the owner's eye? Is it not in a great measure the fault of our architects that so many buildings are continually going up only to be burned?"

* * *

Los Angeles Crematory

The new crematory for the Los Angeles Crematory Association, and for which Architect Charles F. Whittlesey and Company have prepared plans, is to be of reinforced concrete, with stone trimmings. The exterior walls will be plastered with rough cast cement, while the interior walls and ceilings will be of metal studs, metal lath and Alpine plaster. The vestibule and chapel aisle will be of tile and marble, and the gallery stairs will also be of marble. The building will be absolutely fireproof, with the exception of a small amount of mahogany finish in the chapel. The building will be one of the finest of the kind in the United States.

* * *

"You must find that impediment in your speech rather inconvenient at times, Mr. Biggs?"

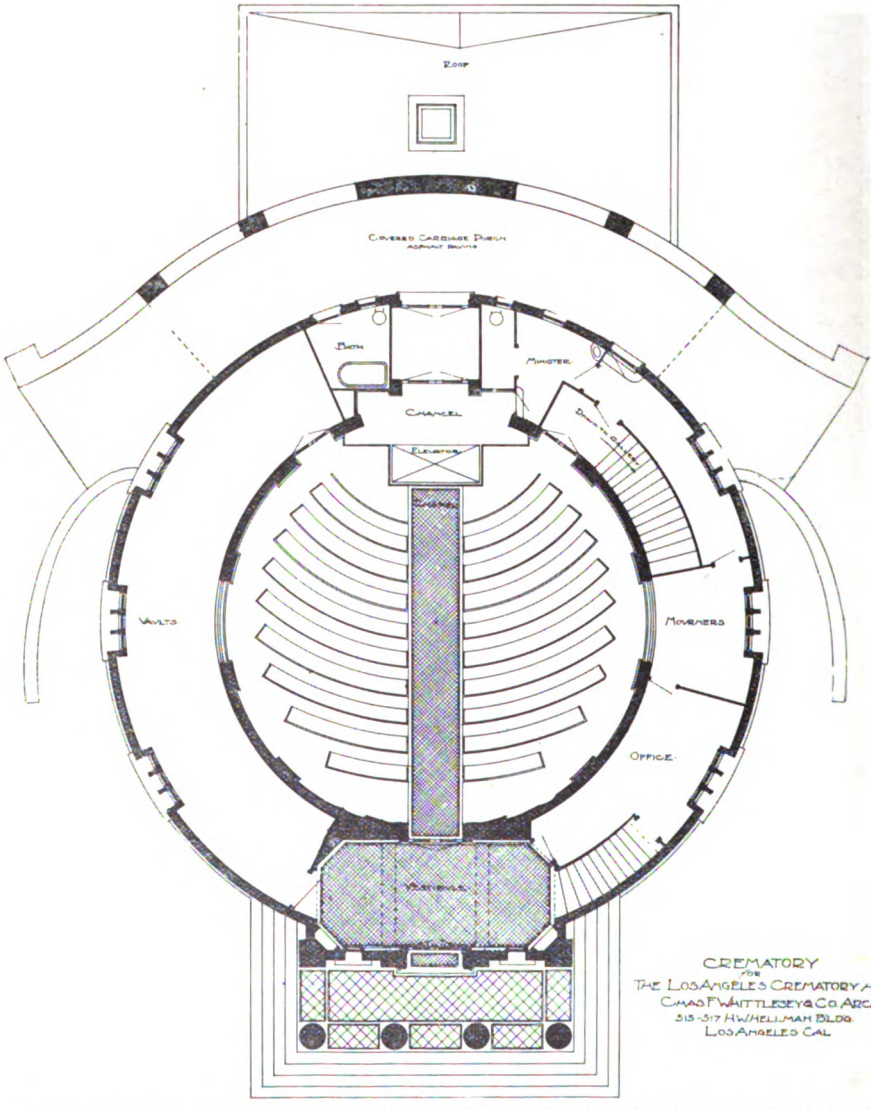
"O, n-no; everybody has his little peculiarity. Stammering is m-mine; what is y-yours?"

"Well, really, I am not aware that I have any."

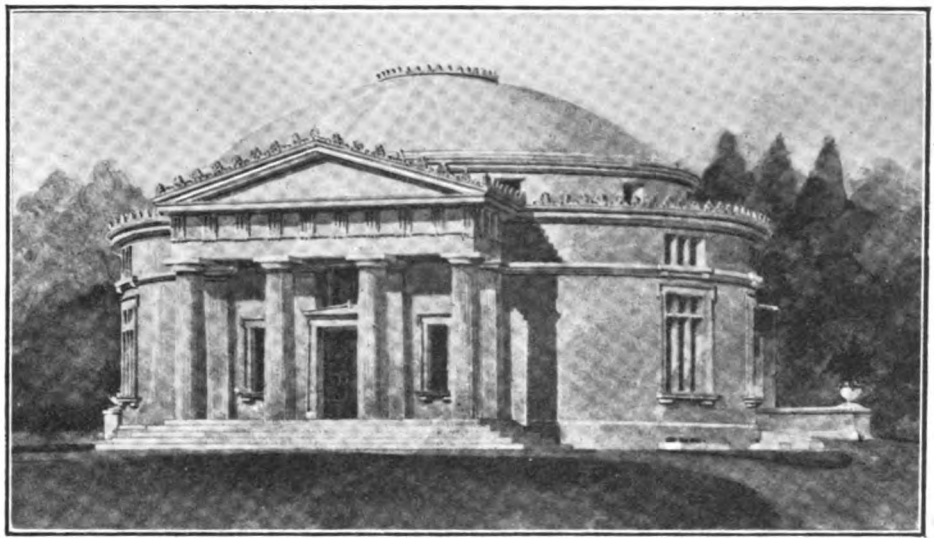
"D-do you stir y-your tea with your right hand?"

"Why, yes, of course."

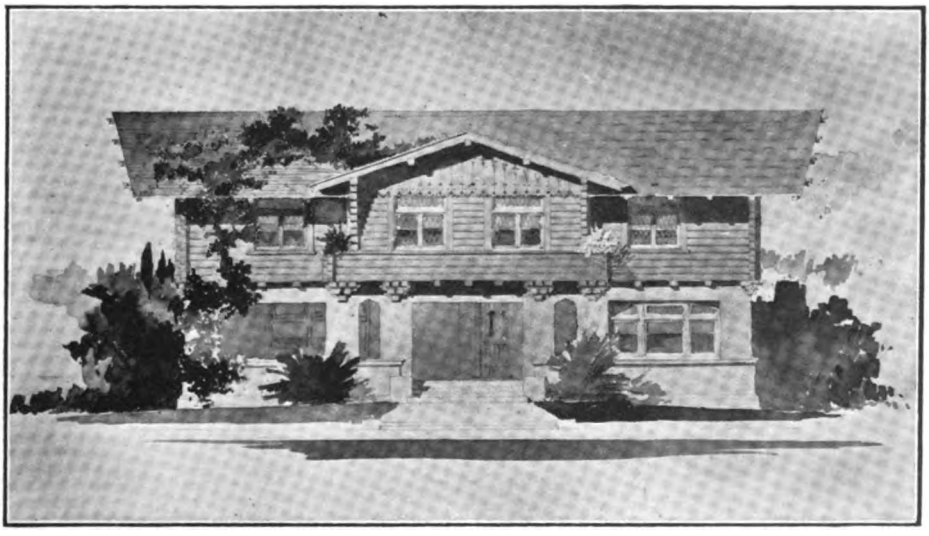
"W-well, that is y-your p-peculiarity; most p-people u-use a t-teaspoon."—Stray Stories.



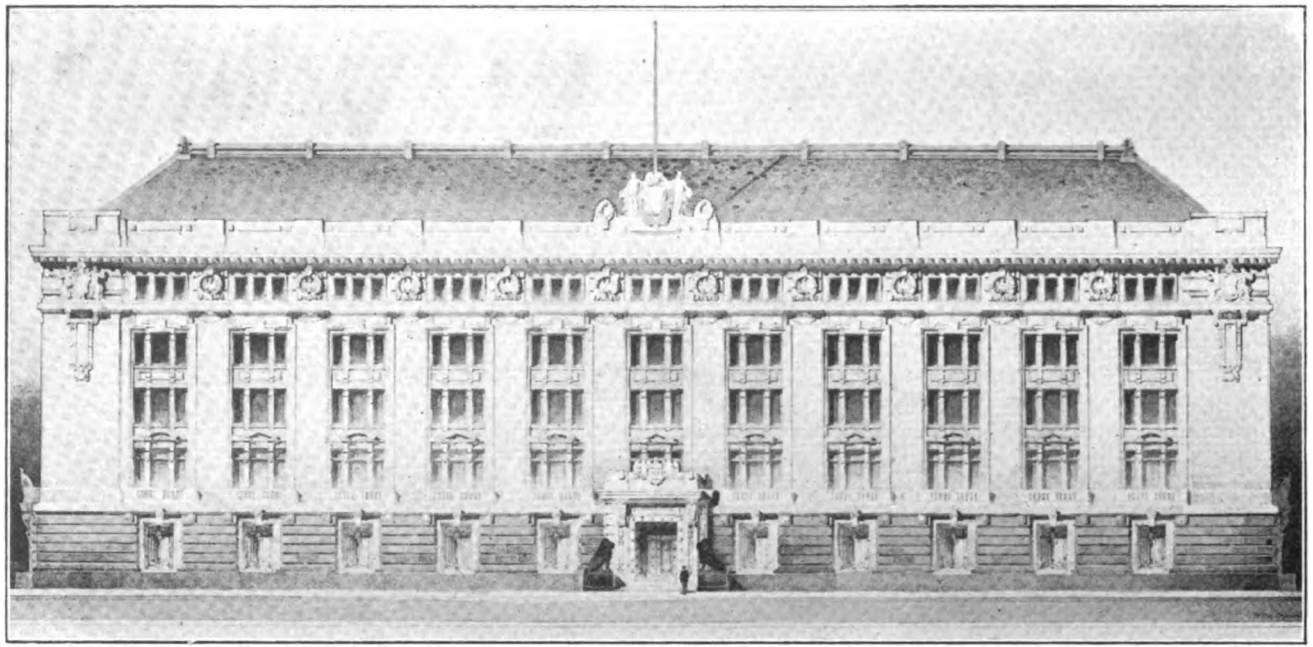
Floor Plan of Crematory for Los Angeles *Charles F. Whittlesey & Co., Architects.* C-208



Crematory for Los Angeles Crematory Association *Charles F. Whittlesey & Co., Architects.* C-209



Residence of Fred. Ripley, Los Angeles *Charles F. Whittlesey & Co., Architects.* C-210



United States Custom House, San Francisco
Front Elevation

Eames & Young, Architects. **C-211**

Paints in Architecture

By W. J. PIATT

NO one thing makes or mars a structure more than its color scheme, no matter if it be exterior or interior. If it is a stone building, then Nature puts in the color; if it is of wood, then paint is necessary, and here is where the hand of man performs some wonderful feats. Nature makes no mistakes in colors. The painter cannot always claim this. He has to be educated in many ways—two in particular—the use and application of paints, and the harmonious combining of colors to obtain a pleasing result. This is where the average painter feels his lack of color values, and is only too glad to place the burden on some inoffensive little woman who does not know if paint is made of lead or glue, but she does know that certain colors look well and others jar. And if the painter will only follow out her suggestions he will probably save himself lots of mental exercise.

However, this may lead to funny results, as happened in an interior city some time ago. The owner of a house desired to have the latter painted, so he hunted a paint store and ordered the job done. The contractor went with him and consulted the owner's wife as to the colors to be used. They went out and looked the house all over, and finally the lady selected a dark rich shade of green for the lower band of the house, which was about half-way to the cornice, and above this was a deep shade of red, something like an Indian red, shaded up to a little brighter tone, but very rich and dark. The cornice and a part of the side were to be finished with the same shade as the base, making practically a band of dark red around the house. The painter seized the idea and told them he understood and they needn't worry, he'd have it all done and in fine shape when they came back from the seashore, where they intended going for a few weeks.

The owner went to the seashore, and in about two weeks he was startled by the receipt of a telegram from his brother-in-law, which read: "Your house is on fire, come home." He and his wife boarded the first train for home, arriving at about eleven o'clock in the morning. When within a block of the house the owner, who was looking in the direction of his home, exclaimed: "My God, Mary, the house is still burning!" and it was, but not with anything more dangerous than red paint. The painter had improved on the lady's color scheme and his values were somewhat strong. The house is still standing, but with a more subdued coat of paint.

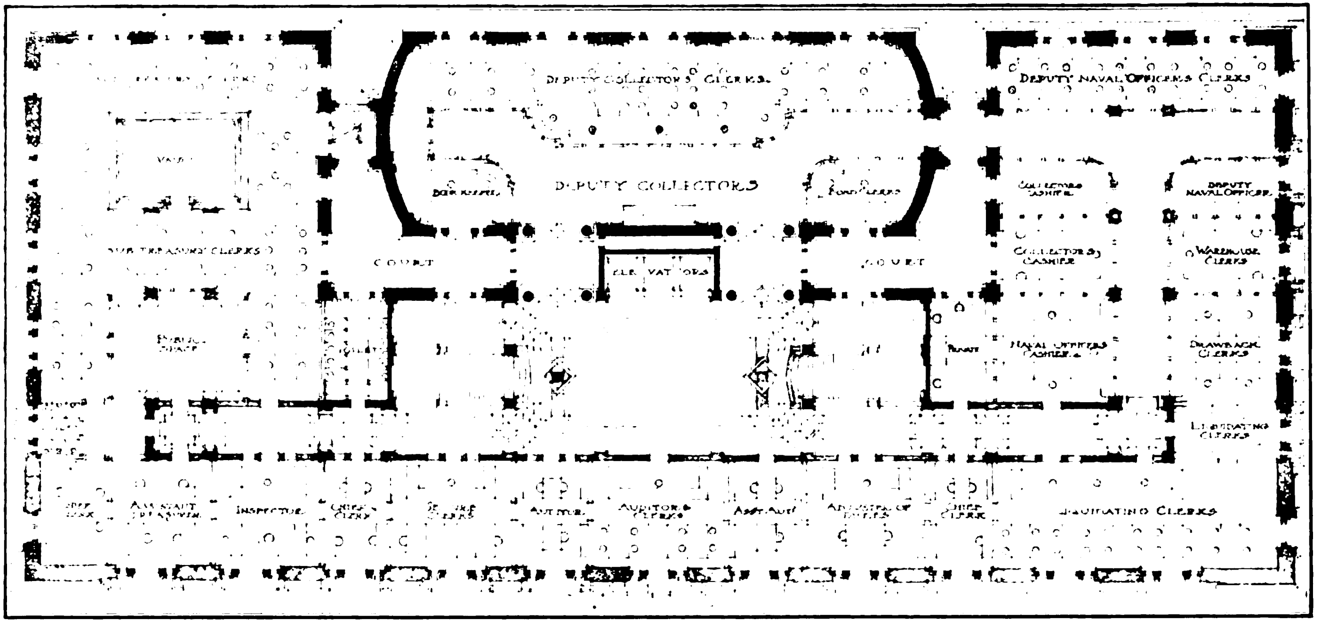
Such incidents only go to show that while a painter may be well meaning, honest and intelligent, it does not necessarily follow that he is an artist.

* * *

A Thanksgiving Prayer

By EDITH LIVINGSTON SMITH in "Good Housekeeping"

I thank you for the harvest, Lord, that you have given me,
For sheaves of dear ones tied about with love and constancy,
And peace of home that fills my doors with blessings manifold;
(For duty to poor hungry souls who stand out in the cold);
I thank you for the harvest, Lord, so far beyond faith's ken—
May I have grace to plant hope's cheer in other lives—Amen.



United States Custom House, San Francisco
Main Floor Plan

Eames & Young, Architects. C-212

Exterior Walls*

By ALFRED SAXON SNELL, F. R. I. B. A.

THERE was a maxim much quoted by a past generation of builders, that a good building should be "sound tie, top and bottom"—that is to say, that it should have a sound foundation, a watertight roof and its walls properly strengthened by the tie of the floor and otherwise. It is also a good commencement for sanitation; for instability of the framework of a building tends in time to set at naught the careful construction of sanitary fittings and to admit damp into the buildings.

I do not propose to discuss the question of the site and the nature of the ground upon which a building should be erected. In Great Britain, and especially in towns, choice of site is restricted. Other considerations than that of suitability from constructional and sanitary points of view are paramount.

We must be prepared to build sanitarily upon clay, gravel, sand or chalk; anywhere between the top of the hill and the bottom of the adjoining valley; on dry ground, on wet ground, and at times on **bad** or polluted ground. In each case we must adapt our method of construction to suit the particular circumstances; but in all cases to secure a sound foundation and the Exclusion of ground air from the building. Under the usual by-laws a layer of concrete six inches thick (in some cases four inches) is required for the latter purpose, but in many cases, I venture to think, it is an inadequate protection. Water will run or rise from damp ground through cement concrete as through a sieve. It is well, therefore, to add a rendering of cement on the top of the concrete; better still, asphalt, which alone can be relied upon to exclude water.

The second safeguard or, so to speak, "line of defense" against ground air is the open space beneath the ground floor, provided it is well ventilated. The sanitary value of an air-flushed space beneath the ground story is scarcely sufficiently recognized. In hospital buildings it is commonplace. Why not in all buildings? It is not too much to say that the free passage of air beneath the building is of more value than a bed of concrete over the site. Ventilation of this space is effected by air bricks in the outer walls, properly distributed to insure that no part is left stagnant. Generally too few are provided, and these are often closed up in time by successive coats of paint or buried by the raising of garden beds next the building.

Moisture will also travel up and through the walls to a surprising extent; hence the necessity of an effective damp-course. The commonest and cheapest form is that formed with slate set in cement. This, if the two courses are laid to "break joint," is effective enough, provided there is not the slightest settlement in the walls; otherwise a break occurs, forming a fissure which dampness can penetrate. An excellent damp-course is also formed with glazed perforated slabs, and these serve also as means of ventilation under the floor. Sheet lead between two thicknesses of tarred felt should be effective, but care must be taken that the joints are very carefully lapped and that the brickwork both above and below is even, so as to prevent perforation by excrescences on the bricks. Almost the only really satisfactory damp-course is good asphalt, about half an inch thick, not more.

Assuming that the lowest floor is as little as twelve inches above the level of the ground outside, a damp-course placed over the whole thickness

*Extract from a paper read by Mr. Snell at the sessional meeting of the Royal Sanitary Institute at Cambridge

of the walls, etc., below the floor sleepers and a few inches above the ground is quite effective. But when, as is often the case, the lowest floor is below the level of the ground, obviously the simple damp-course is ineffective by itself. It is possible, of course, to keep the wall dry by turning the damp-course up the wall on the face to a few inches above the ground, but great care is required to insure a proper junction at the angle of the vertical and horizontal layers.

Another method is the construction of a "dry area," which is usually formed by carrying a thin (half-brick) wall from the footings up to the ground level. In order to withstand the pressure of the earth outside this wall must be provided with means of support from the main wall; either small bent iron ties or occasional brick ends bedded against the wall, and always with a small piece of slate placed between the brick and the wall. Obviously, without the slate the porous brick end would convey dampness to the wall. It is a clumsy method, but quite effective if carefully done.

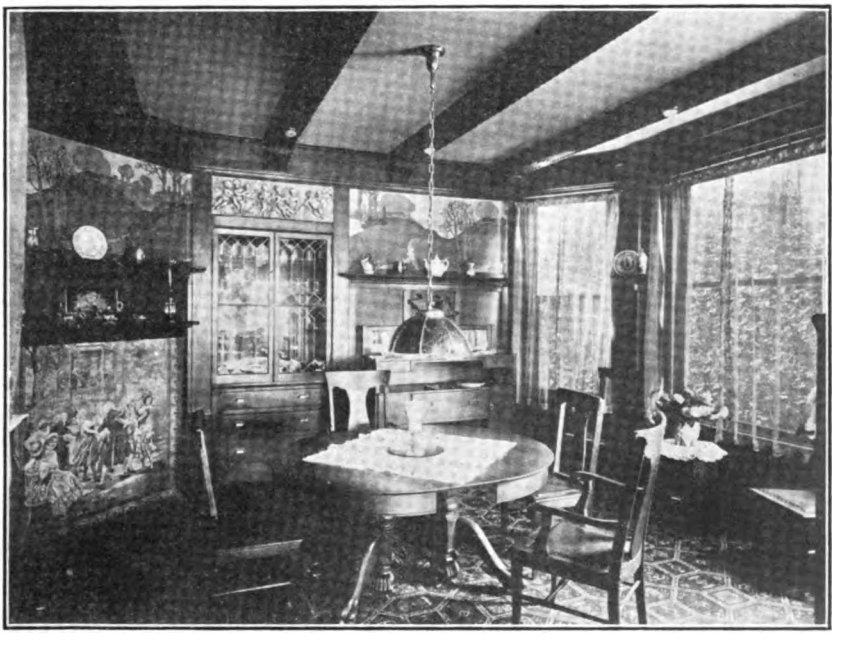
Various forms of iron ties are used, and all are designed to prevent water traveling above the surface toward the main wall. A very effective vitrified brick is also made for the purpose, and is built into both walls. It will bear more pressure than the iron ties, and is, of course, not liable to corrode away. The vitrification of the materials renders it impermeable by water. Neither the vertical damp-course nor dry area can be considered good sanitary construction. A wide-open area is the only satisfactory solution, and this should be carried down at least a foot below the floor level. Thus the whole surface of the walls of the rooms is exposed to the air. The part played by the porosity of walls in the ventilation of buildings is apt to be overlooked. The best sanitary construction is to avoid basements or semi-basements altogether for living rooms.

So far we have dealt with dampness arising from the ground. Next in order is that arising from the rain beating on the surface of the walls. Damp walls are obviously unsanitary, and here we are met by a difficulty. If a wall is constructed so non-porous as to exclude water, it may also exclude the passage of air. What is required is a construction which, as far as possible, shall attain to the ideal supposed to be the special property of certain much-advertised cloth materials for coats, which claim to be "rain" but not "air" proof. As a rule, and except in exposed positions, good brick-work is very satisfactory in this respect, and the ordinary London stock brickwork especially so. The vertical surface of the bricks has a very thin skin, which acts as a slight check upon the entry of water, and the rain, therefore, runs more readily down the surface to the ground. The weak spots are the mortar joints and any horizontal surfaces. At the joints it is impossible to avoid small ledges being left either on the brick or mortar, and these at once collect the water and allow it time to penetrate the brick-work. The "cut and struck" weather joint counteracts this to some extent. In making this joint with the point of the trowel, the pressure used consolidates the surface of the mortar, thereby closing up the larger pores. The outward slope throws the wet forward from the face of the wall, and the sharp edge assists this action. Another safeguard against damp in the wall is solidity of construction. A solidly built wall may hold water in the innumerable pores and small interstices of the bricks, and this may go right through the wall, but generally it travels so slowly as to be absorbed by evaporation before it has gone far. Voids in walls, formed by lack of sufficient mortar in the joints, collect and convey water readily to the internal face.

In very exposed positions, and especially with a west and southwest aspect, brick walls fourteen inches thick, or even more, are not rainproof,

and it then becomes necessary to protect them by special means. One of the most ordinary methods is that of building what are called "hollow walls." The outer wall forms in effect a "dry area." Inasmuch as the main wall cannot be reduced in thickness, the method is not cheap, but it is certainly effective. Another and more picturesque method is to tile the external face of the wall. The tiles would be secured by nails and bedded in cement or plaster, or merely hung on fillets nailed to the wall. I have also found that slates bedded in mortar and with a three-inch lap are absolutely effective. A rendering of cement or even painting with tar is of use.

With respect to materials of construction, obviously anything likely to nurture or, under given circumstances, generate noxious gases or growths must be considered as insanitary for use. I have heard that ordinary road drift makes very strong mortar, and this is no doubt due to its main constituent—washed (i. e., sharp) sand. But in general it also contains particles of manure and decayed vegetable matter, which cannot but be injurious and a source of pollution to the air passing through a wall. Ordinary pit or other unwashed sand has been objected to on the ground that it contains various particles of organic matter, but with fairly clean sand the danger is a negligible quantity. Mortar formed with finely ground coke-breeze is, of course, entirely free from objection, and it is very strong.

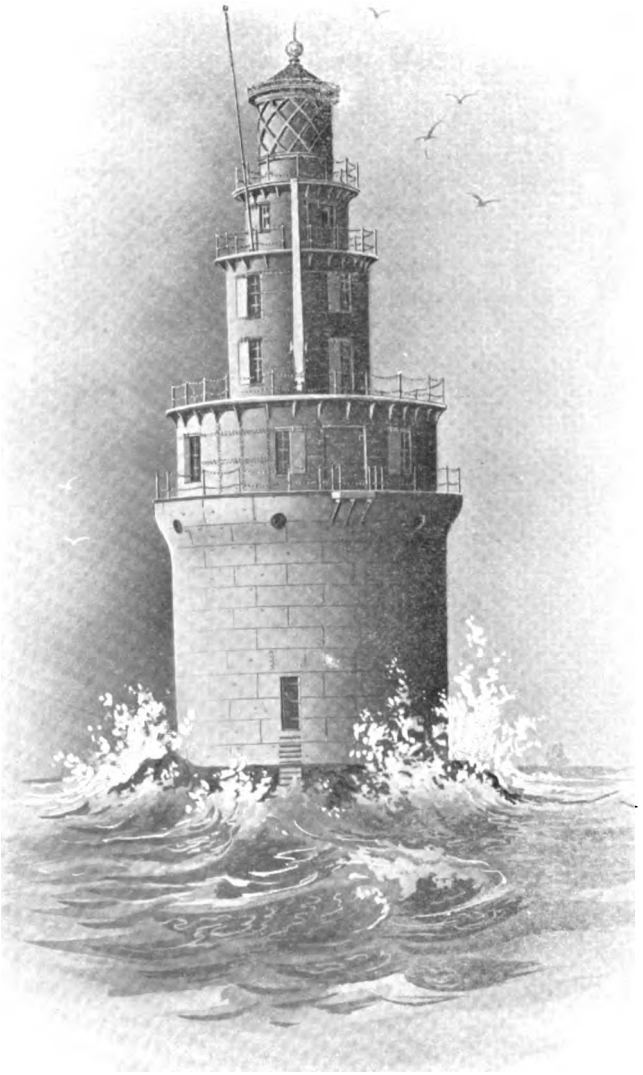


Dining Room in Residence of W. W. Tucker, Linda Vista, Oakland C-213

Majestic Theater and Office Building, Los Angeles *F. A. Rosenheim, Architect.* C-214

Methodist Church, Sacramento *Seadler & Hoen, Architects.* C-215

Design for Proposed Apartment House, Sacramento
Seadler & Hoen, Architects C-216



Lighthouse of Reinforced Concrete near Golden Gate
Malthoid Roofing by Paraffine Paint Company

C-217

Cement and Concrete

Portland Cement for Lighthouse Construction

THE superior advantages of concrete are demonstrated in the construction of a light station upon Mile Rock, at the entrance of San Francisco harbor, a short distance from the Golden Gate and not far from the eastern shore. Mile Rock projected not more than sixteen feet above the mean sea level and at high tides was entirely submerged. For more than half a century this point was a menace to navigation. Four years ago the large steamship Rio de Janeiro, when attempting to enter the harbor during a foggy night, missed her reckoning and ran on this point. In less than forty minutes the vessel was destroyed, with a loss of one hundred passengers and a large and valuable cargo.

For many years engineers have thought it entirely impracticable to place a beacon upon this point. However, the Government recently decided to construct a lighthouse regardless of labor and expense. At most only 1,000 square feet of surface was available after the rock had been leveled to some extent and only 704 square feet were secured as the foundation for the base of the light station.

This foundation was prepared elliptical in shape, being forty feet long by twenty-five feet across. An immense steel shell was prepared and anchored to the main body of the rock, after which it was filled with reinforced concrete. When this layer had set, additional sections of the steel cylinder were added and filled in the same manner, until the foundation was extended forty feet above the rock.

Sixty tons of steel plating and 1,200 barrels of Portland cement were used in the foundation, which was the most difficult and hazardous part of the entire work. Above this a tower of fifty feet was then built, surmounted by a third-order light. From the mean sea level to the top of the tower is ninety-two feet. In construction of the section above the foundation an additional amount of ninety-two tons of steel were used. More than six months were required in building the foundation alone and a year to complete the entire station. The total cost of the lighthouse was $100,000.

* * *

After some more or less costly experiments, says the American Lumberman, the concrete tie has been pronounced a failure. The cost of manufacturing the concrete tie was $2.50. Now, here is a problem for some of the sharp-penciled members of the trade to figure out: That if it costs $2.50 to unsuccessfully imitate with concrete a piece of work containing about forty feet of lumber costing about 60 to 75 cents, how much will it cost to imitate good common brick which sell at an average price of $5.97 with concrete blocks in the same manner? It also might be remarked in passing that some people are not willing to learn from any one but the costly teacher of experience.

Architecture of Concrete Building*

By FRANK DYKHEMA

IN ASSIGNING to me the subject of "Architecture of Hollow Block Buildings," a rather difficult task has been given, considering the radical difference in opinion in reference to methods of manufacturing blocks existing between my firm and many of those present. In dealing with the subject I have tried to eliminate as far as possible any personal ideas I may have, to present the matter as nearly as possible from the standpoint of the architect. While to a large extent we are not dependent upon the architect for the success or failure of the sale of cement stone, and by this I mean that the recognition by the user of stone will eventually force recognition by the architect, still it is the architect finally who creates the style and develops the best methods of using a new material, and finally we must produce that which the architect demands.

While it is true that three-fourths of the buildings constructed are never heard of by the architects, it is also true that practically all buildings are constructed along lines developed by architects, as sometimes the ideas are originated by the architect, and whether a plan is bought and paid for, or whether the ideas are borrowed from work already done, does not change the origin of the idea. Broadly speaking, the art of architecture is the art of combining the qualities of utility and beauty. A building properly designed must satisfy both as to proper interior arrangements, sanitation and convenience combined with a satisfactory exterior effect, and in all a durable building as free as possible from the repair expense.

There is no question as to the use of cement stone in building construction. Even the most obtuse of the architects admit this, however grudgingly they may do it. The general desire today in any construction is to create something permanent. American life has been a hurried one, and the most desirable quality in any structure has been immediate utility rather than long life. The standard of values is changing and permanency is demanded as one of the first requisites. This is not alone apparent in building, but in nearly everything in which wood has been used and in many cases in such structures as have been made of natural stone, brick and steel.

With such a sentiment there is the demand for a material possessing the element of permanency. The development of the manufacture of cement has been opportune. Regardless of the cost of brick, wood or natural stone, a field must develop for cement stone.

The first demand by the architects is quality—that we can supply—little question is raised now as to qualities of cement in building construction in durability. Freedom from the effects of the elements, which tend to destroy other materials, is too well known. The value of the hollow wall as a sanitary feature is a fact that has been recognized for many years and striven for with poor success and greater expense in other styles of construction. The fireproof quality is generally acknowledged by everyone, except the fire insurance people, upon whom our good friend, Mr. Wiltse, has been making a good fight.

We have, therefore, to offer to the architect the ideal material so far as quality is concerned, but he asks more than this. To develop artistic effects he must have more to work with than mere durability. This is the work that is given us to do. We are the pioneers in a great movement and we must furnish the ideas for the architect to work with.

*Paper read before Concrete Block Machine Convention.

Cement stone represents a radical development in building construction. It is absolutely new. It is an honest material. It gives full service wherever used properly, and its use makes possible new and novel effects in the exterior of buildings.

To develop artistic effects the architect requires adaptability as to form, opportunity to use contrast in color, form, line or texture. The whole necessity finally develops into ability to develop contrast. As stated above, cement is an honest material, it is a good material, and is amply able to stand for itself. Artificial stone, which we all started to make, is already a thing of the past. Cement stone is the material we are dealing with now, and as cement stone, this new material must stand or fall. The architect does not recognize any imitation or anything artificial, and will not deal with it as such. But there is no necessity of imitation. Cement is rich in possibilities both as to form and finish. The production of any form demanded by the architect is only a matter of mechanical ingenuity, and the development of proper finishes and effects is a matter of study and thought to bring out the latent qualities in the material with which we are working.

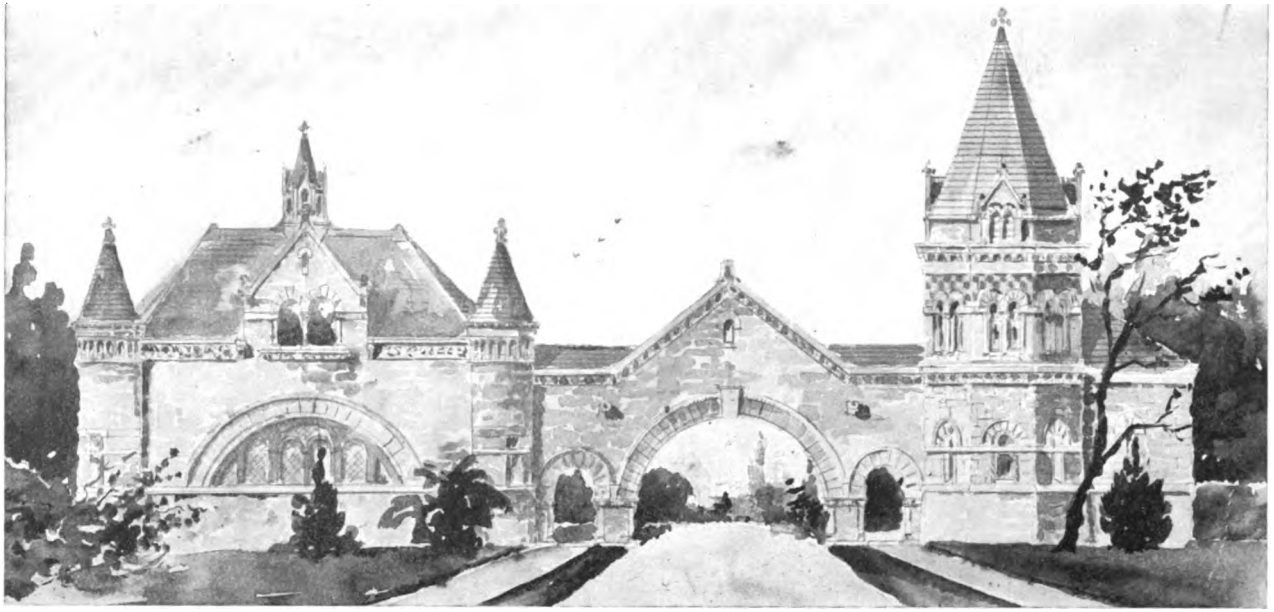
So far as the development of the form is concerned, I think we are all sufficiently ingenious to accomplish anything the architect may want, and so far as the want being created, we have had no difficulty in supplying what is wanted. In finish I think we disagree with most of the architects, inasmuch as we do not favor the rock face. The rock face is nothing but an imitation of the cheapest form of natural stone. How we got started on rock face stone is a mystery. The better class of architects do not want rock face in their building, and while it may not be necessary today, the time is not far off when we must give the architect what he wants in the way of finish, so that he can develop a face satisfactory to himself. The average stone today has a molded face and beveled edge, and that is about the limit. There are unlimited opportunities for coloring for finishes, for variety, which we do not conceive at the present time, and I think that is one of the important things we ought to think of when we go away from here, and I know we should give a good deal of attention to the subject of finishes, so that the architect will have greater possibilities in finishing up his building. When we can produce such colors and effects that the architect can erect his building as a whole, produce a general effect throughout the whole building and not limit it to rock face and the few finishes to which we are now limited, I believe the architect will be with us, and I believe the value of this organization will be to bring that about.

* * *

The Manufacture of Cement Poles

THE growing scarcity of suitable timber for posts and the increasing cost have caused a strong demand for a substitute which will be at the same time cheaper and durable. To meet this urgent demand engineers and inventors have brought forward steel posts, cast iron posts, cut stone post and finally concrete or artificial stone posts. These latter have been tried and not found wanting. The principal materials for their manufacture, sand or gravel and cement, are easily obtainable in every locality, and what is a determining factor, are remarkably cheap. The third element necessary in the manufacture is a steel reinforcement.

After all experiments and ventures have been tried, it is now a known fact that the best and cheapest reinforcement is steel wire, cabled tightly.



Woodlawn Cemetery Gateway and Chapel near Colma *T. Patterson Ross, Architect.* C-218

This great value of steel wire reinforcement is obtained from the well-known principle and scientific fact that steel in tension and concrete in compression are the best materials used in their strongest way. The reinforcement being decided upon, the next step is the position of this and the method of making the post.

The best place to have the reinforcement is in the corners of the post, because the greatest strength is obtained by so placing, and the nearer to the edge they can be placed without danger to the concrete breaking out under the strain the better. I have found that in an ordinary line post the wires should be placed within a half inch of the edges. By placing the reinforcement in each corner of the post two wires in tension are always secured, no matter from what direction the strain comes.

The next consideration is the method or process of making the concrete. I have found that the tamped or dry process has not been as successful in tests as the wet process product. The latter uses less cement, makes a denser post and gives the cement enough water to make nearly perfect crystallization, at the time when it needs it, and not after the initial set has taken place. The tamped post is more subject to the action of the elements, and water penetrating it readily makes it liable to injury from frost. The wet process post has a glaze on the surface that makes it nearly impervious. Furthermore, there can be no accurate placing of the reinforcing wires with the tamped post, for the reason that the tamper will displace the wire, and the concrete will not form around and unite with the wire, sinking into the shoulder of the twist and not allowing the wire to stretch as it will when wet enough to pour. All in all, I believe that the most successful way to make a fence post is to pour it.

After posts have been molded and the concrete has set, they are ready for the curing, which should be done in the manner of other concrete products keeping them well sprinkled. The posts can be used in thirty or even twenty days after they are made, but it is advisable to keep them at least sixty days previous to setting out.

The posts, being made of true concrete, grow constantly harder and better by exposure to the weather. I have observed posts that have been allowed to freeze in a river and thaw out that were apparently stronger than before. The farmers of today are alive to every meritorious article. They read their farm journals carefully, and they are aware of the fact that there are some posts better than wooden ones. They have the money to invest in a post that offers durability and they are willing to invest it. The field for making the posts is unlimited, and the demands are immense. To fence the United States farm lands properly would require the enormous number of over three and one-half billions of fence posts. The possibilities of the business are simply enormous. The consumption of fence posts in this country today touches so high a figure as to stagger the mind. A conservative estimate shows that the number of posts in use at the present time in the United States is 3,446,345,528. The field is an especially alluring one and is sure to bring financial success to the progressive business man who enters upon it promptly.—H. A. Lowe in "Concrete."

* * *

More things are damned by hot air than by faint praise.

Just as soon as you begin to knock your competitors you are in danger of knocking the pins from under your own proposition.

People most generally buy the things that have reputation back of them. Good advertising helps to make a good reputation for anything that is rightfully entitled to it.—Exchange.

Concrete Structures for Water Supply and Drainage

Almost every day some new kind of work is described as being made of a mixture of cement, stone and sand, commonly called concrete. In the city of Boston, owing to rather stringent regulations regarding the number of apprentices on brick sewer work, a large number of concrete sewers have been built or are in process of construction. For similar reasons an intercepting sewer in Utica was built, for the most part, of concrete. A large number of cesspools and tanks are now constructed wholly of concrete because of the many advantages this form of construction offers, in that it can be done without skilled labor, as the material can be placed in practically any position and readily conforms to unusual lines. Reservoirs, wells and dams built of concrete are of every-day occurrence. At Attleboro, Mass., a standpipe is being built of reinforced concrete, which, it is claimed, will be the largest of its kind in the world. This standpipe is to be fifty feet in diameter, one hundred feet high, with a capacity of 15,500,000 gallons. Not among the least of the advantages claimed for this style of construction is the less cost for maintenance, a steel standpipe of this size costing about $400 a year for painting, aside from the loss of the use of the structure when it is being painted on the inside.—Carpentry and Building.

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Cost of City Halls

In discussing the cost of city halls a recent issue of the New York Sun states that the 175 chief cities of America have $100,000,000 invested in city halls. Philadelphia leads with a $27,000,000 city hall, and San Francisco follows with one worth $8,300,000. After these cities come Boston, with a city hall representing $7,500,000; New York, with one standing for $7,000,000, and Baltimore, with a $5,000,000 structure and grounds. The value in each case is based upon the value of the city hall itself and the park or grounds surrounding it.

Every American city of more than 300,000 population has at least a million-dollar city hall with the exception of New Orleans, St. Louis, Cincinnati and Detroit have buildings worth more than $2,000,000 each. Chicago falls $250,000 below that figure. Pittsburg and Milwaukee follow.

Among minor American cities which have elaborate city halls are Richmond, Va.; Minneapolis and Providence. Indianapolis, which has a stately State house, has an inferior city hall. Toledo and Atlanta have small municipal buildings. The Denver city hall is valued at $265,000; that of East St. Louis, a place of much less importance, has one that cost $425,000. Houston, Texas, has a $550,00 city hall, and Memphis one costing only $35,000.

✤ ✤ ✤

There is an aristocracy of books as of people. The lines of demarcation are plainly marked. You may elect that which you will.

When a man reaches the age of about forty years, he then spends much of his time taking inventory of those things which he thought he knew, and sifting out that which is of no account.

Terra Cotta and Brick

Coming Convention of Brick Men

CALIFORNIA will, of course, be well represented at the coming convention of the National Brick Manufacturers' Association to be held in Philadelphia, Pa., February 5th to 17th. It has been sixteen years since the association held its previous convention in the City of Brotherly Love, but those who participated in the first N. B. M. A. meeting there will remember the large attendance, the instructive sessions and the good cheer and cordial hospitality of the local members.

The attractions of Philadelphia are numerous and varied. There are within its gates many things of historic interest, the first of which is Independence Hall, where the visitor will find the old Liberty Bell, so dear to the heart of every American citizen. Then there is the United States Mint, the greatest money-making establishment on this continent; the splendid City Hall, costing many millions; the beautiful Masonic Temple, and many similar structures. These, the famous Cramp shipyards and numerous other like industrial institutions, including the clayworking plants, of which there are many of peculiar interest to the members of the association, will be open to the wearers of the N. B. M. A. badge.

To those on pleasure bent, Philadelphia offers an endless variety of amusement; there are theaters galore, where the grave and gay alike may indulge their fancy, whether it may be for music, drama or farce. While the public gardens, museums and art galleries and industrial schools and institutions of learning afford an unlimited field for study. But Philadelphia is not alone attractive and desirable as a convention city by reason of the wealth of her own resources, but as well for her proximity to other great cities of the East. Atlantic City, the most famous of American winter resorts, is distant but an hour's ride, while Trenton, the great pottery center, is nearly as accessible, and New York, Baltimore and Washington are reached almost as quickly.

* * *

Tile-Laying Hints

Tiles are in general most economical to begin the work of underdrainage, and most satisfactory in the long run. It costs less to dig a narrow ditch and pay for the tile and lay it than to dig a wide ditch suited to the laying of a stone drain, and when done the chances of a good, efficient drain are largely in favor of the tile.

They must be laid with uniform down-grade; any deviation from this rule is likely to give trouble. In laying the tile, fit them as closely at the joints as it is conveniently possible. You need have no fear that the water will not get in; you cannot keep it out. If the bottom of the ditch is sandy or has quicksand, it is necessary to lay the tile on narrow boards, so that the settle may be uniform. It is also necessary to cover the joints with clay; if clay cannot be had, a strip of tar paper will do to wrap around the joint. Remember that the straighter your tile are laid in line, the better the flow of water.

It is better to have a good tile drain and a good crop and make those doing the work feel that they are laying the tile on honor.—Exchange.

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The Care of Public Records

I RECENTLY visited a public building in one of the large cities and saw records of the most valuable nature lined along wooden shelves, exposed to elemental action and more than the ordinary wear and tear; priceless documents were contained in cardboard boxes; the furniture was old and dry and of the most inflammable character. Is it a wonder that so many public buildings and their contents are destroyed? The following is an authentic list of public buildings destroyed during the past twenty-five years, not including some of very recent date: Thirty-four State houses, 723 courthouses, 1960 city and town halls, 1424 banks, 163 public libraries. This list does not include the destruction of the State capitols at Des Moines, Ia.; Madison, Wis.; the courthouse at Wateska, Ill.; Liberty, Ind.; Waynesville, Mo.; Brighton, Col.; city halls at Marlboro, Mass.; Wilmington, Del.; Stamford, Conn.; Meriden, Conn., or any of the public or semi-public buildings destroyed in last year's great fire at Baltimore.

Who pays the cost? The taxpayer. Is his censure often uncalled for? He can at least claim that it devolves on the public official himself to see that he is furnished with "precautionary" equipment or indestructible devices for the proper protection of his tools of business. It is true, no doubt, that the first cost of steel furniture is more than that of wooden equipment. But what of that? A steel constructed building costs more than one of wood; a brick costs more than a frame one; the idea is protection. The safety and security of our public records are surely not to be disregarded because of the cost of this item.

It is the duty of the commission in charge of public buildings, and of the public official in whose charge these valuable records are, to adopt the right kind of equipment.—M. G. Reeves.

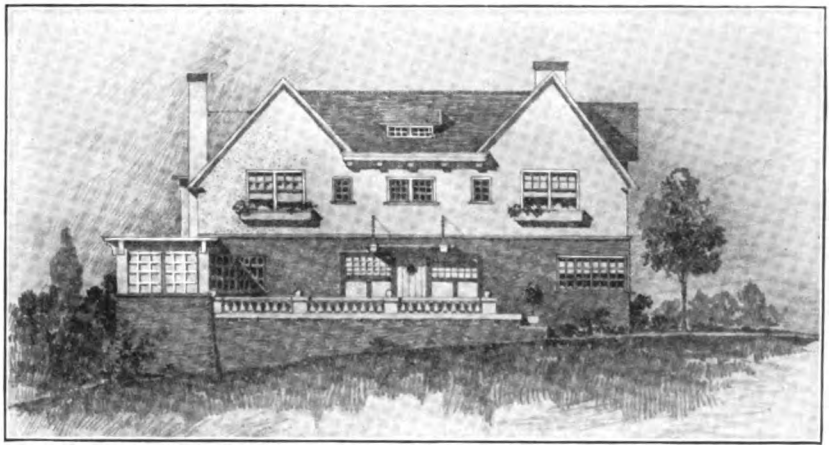
* * *

If we were a school teacher, we wouldn't stand being called a pedagogue on the small wages that goes with the job.

There are some women who enjoy being martyrs so much that they would positively enjoy being shut up in Port Arthur.

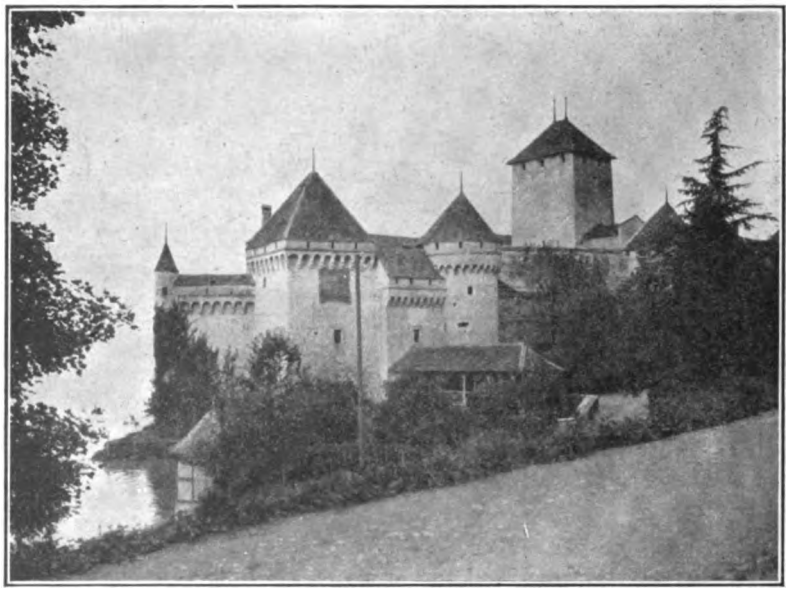
Some men think it a great honor to be elected a "delegate" to attend some fool meeting. It is loafing, pure and simple. Don't deceive yourself.

When a man begins to call attention to people in connection with remembering when they were born he is getting old.



A Picturesque San Francisco Home — *Havens & Topke, Architects.* C-219

Residence of Mrs. J. E. Merritt at Presidio Terrace — *Havens & Topke, Architects.* C-220



A Castle by the Sea C-221

Homestead Loan Association Building, Berkeley *C. W. Dickey, Architect.* C-222
Stone Furnished by Andrew T. Hunt

Experience—Comment and Suggestions

Roofs and Roofing

By HARRY LARKIN, Member Technical Society of the Pacific Coast

THE roofing of buildings appears to be a branch of the building business that brings to light the inventive genius of numerous minds. New roof coverings appear from time to time burdened with a name indicating the perfection the inventor hopes to reach, and pushed into prominence with descriptive circulars making statements no mechanic in his normal state of mind could believe.

The writer looks back with amusement to the advent of "aluminous metal roofing." It was a material to be laid with standing seam, that would not rust, needed no paint and would wear for ever in the salt atmosphere of San Francisco. It was used on several prominent buildings, for a short time. It did not rust, but it would leak. Expansion and contraction pulled the roofs to pieces. All of the aluminous metal was replaced with other materials in very short time.

Patent steel roofings have wormed themselves into specifications through florid statements of their being simple, cheap and made of steel. None of them are adapted to anything but straight shed or hip roofs, and would keep the painters busy to prevent rust. Steel is the curse of the metal roofs of today. When the old style wrought iron was used in making terne, the tin roofs gave good service. All the "re-dipping," etc., of the modern roofing tins does not give them one-tenth the life of the good old tins of twenty years ago. Every tin roofer knows that, and will admit the materials furnished him today are driving him out of business. The reason shingle roofs fail is on account of the little steel wire nails used in laying them. Shingle roofs on the comparatively cheaply built houses erected in the Mission thirty years ago by the Hollis Company are good today. Those roofs were laid with cut iron nails.

The asphaltum, felt and gravel roofing industry has had its ups and downs. In the good old days when each roofer got his $8 per square and refined his crude rock asphaltum on each job, they got good roofs. There were but few that understood the business, little competition, and things looked like a day in June. Alas, some fertile mind discovered that coal-tar was a simple article to manipulate, looked like asphaltum and was cheap. The result was the replacing of asphaltum roofs with coal-tar roofs. The tar roofs were cheap, and the owner got just what he paid for. "Composition" roofs fell into such bad repute that the mention of one gave the prospective builder the horrors. The use of tin became almost universal, but of late has, in its turn, been replaced by the superior article.

Asphaltum is now abundant and of much better quality than the best used thirty years ago. Felt is being saturated by six different manufacturers in San Francisco and immediate vicinity, and as a result quality is excellent. The one other article needed besides good materials to make a good asphaltum roof is experience. There is sufficient at command in this city without depending upon the new arrivals who have ideas to revolutionize established methods. With these new arrivals has come a host of ready roofings, all depending for their waterproof qualities upon asphaltum. Whatever their good features, they are all weak at the joints.

The mechanic is not yet born that can lay any of these ready roofings on a house built after the ordinary plan of today and have the roof tight through the second winter. All these roofings expand and contract, and as the nailed joints are the immovable point, the contractions centre there. The result is a hole at every nail that no amount of plastic cement or paint will stop. The felt and gravel roof of today has no joints, and corners are formed by interlacing the plies of felt so that flashings, roof and all are one continuous piece.

Slate roofs are being more generally used on residence work, and there is no question but a well-laid slate roof is all that could be desired both for appearance and wear.

The quarries in this state have now been sufficiently developed to guarantee the continued production of a highest grade of black slate, and together with the local production of alphaltum, guarantees roof coverings of the highest grade, suitable for all characters of buildings, and what is particularly pleasing, products of our own Golden State.

* * *

New Los Angeles Theatre

Los Angeles is to have a $450,000 theatre—the Majestic—from plans drawn by Architect A. F. Rosenheim. The new playhouse will be one of the handsomest on the Coast. The basement walls, piers and retaining walls will be of heavy concrete construction, the front will have a polished granite base, with blocks of terra cotta facing up to the third story, from which point white pressed brick will be used. The upper portion of the front will have an elaborate galvanized iron cornice with a projection of 5.2 feet. Above the cornice will be dwarf standards with electric light fixtures.

The building will be erected over a steel frame, which will be protected with fireproofing material.

The floors, roof and basement will be of cement and concrete, and reinforced with ⅜-inch round steel bars.

Hollow tile will be used for all partition walls. There will be light and airy courts faced with white enamelled brick.

In the office portion of building an iron stairway will extend from the basement to the top floor. The mercantile rooms will have maple floors and the woodwork will be of oak.

The upper floors will have fireproof finish marble wainscoting and plaster mouldings.

There will be two electric passenger elevators and one freight elevator. At the entrance to the theatre will be a large cast and wrought iron masque supported by heavy iron chains. It will have a roof of wire glass and ornamented with bronze grill work. The grand entrance will have marble floors, dado and

piasters. The grand foyer will be 26 by 50 feet, with marble floors and wainscoting, beam and plaster work. There will be a marble double stairway from the foyer to the balcony. The auditorium and stage will occupy a space 82 by 145 feet, of which the stage has 34x82 feet and the auditorium 82x111 feet. A large amount of ornamental iron and bronze work will be used in the various portions of the building. The store fronts will be of cast iron.

* * *

The Philosophy of Graft

THE standard of success is changing. It is coming to be achievement, rather than possession; what a man does, rather than what he has; ability, not respectability—at least not respectability based on freedom from manual work.

What is the philosophy of graft? To get all one can without caring to give value received. It is a relic of the predatory stage of development—the days when riches rather than achievement was the measure of success.

The philosophy of graft is being undermined by physiology and psychology, as well as by ethics. Certainly every normal man wants money, the goods of life that money can buy. But the grafter, the man who doesn't earn that money, misses half his life. The man who works is the man who is healthy, hopeful, happy as well as moral. The man who does not work becomes unhealthy, morbid. He resorts to vice, because he lacks the expulsive interests of creative work. It is not merely that he occasionallly runs into a Folk or a Jerome, but he misses the pleasure of doing things worth while.

There is a joy in workmanship. An artisan will tell with pride of the buildings he has put up or the machines he has managed.

There is joy in running a machine just as there is in managing a productive enterprise. Armour kept to his office because he enjoyed his work. He could nowhere else so surely get ten hours' fun a day.

It was said that work itself is a pleasure. This is true if one can do something that is wanted, and can do it well. With technical skill he can give his work artistic finish and gain the artist's delight in creation. The drudgery of work comes either from lack of skill or lack of strength. The strength is a matter of length of working day. The skill is a matter of industrial education.

Most people can do something useful if they try. All children, practically, can be trained to technical skill which will render work an artistic enjoyment, not drudgery.

This emphasis on industrial training in our day is not gross materalism. It is the higher, more practical idealism, that of mastering things for human ideals.

This is coming to be an age of technical education. When all are able to work usefully and see that there is joy in useful work, it will cease to be the age of "graft."—The Manual Arts Booklet.

* * *

The first time a boy is called mister it makes him feel as queer as a cussing.

When a man gives a girl a sensible present, that is one sign that the wedding day isn't very far off.

The City Beautiful

Ornamental Trolley Poles

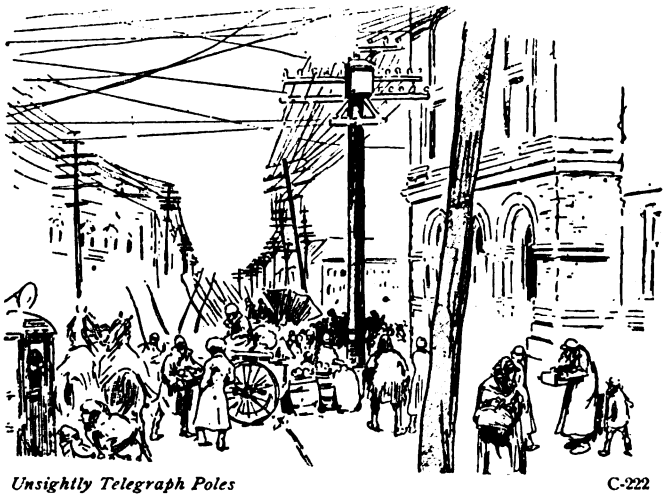
MANY experiences of the vulgarity of standard objects of utility, which are made ornamental, makes one receive without much enthusiasm an announcement that American ornamental trolley poles have come into the market.

The best ornament for utilitarian objects is the ornament of a meek and quiet spirit, and when the object is a trolley pole the primary beauty is most emphatically the grace of uprightness. Overhead wires of any kind are an injury to civic beauty, and the ultimate aim must be to get rid of them; but their evil influence is much mitigated if the poles which carry them are plumb. This is all that is required of double poles. Their purpose requires no excrescence of any kind, and there is, therefore, no occasion for ornament. Single poles, which have an arm on either side or on both, are susceptible of improvement by care in their structural design. There is a junction to be redeemed from crudeness, and proportion to be observed between the vertical member and the arms; also the arms have ends which want emphasis, and, being the ends of a tube, would, for the sake of wearing well, be the better for a cap. At or near this point must be a hold for the wire. That is the sum total of the motives for structural design, and if they are all satisfied in a simple manner, and the pole is plumb, which it is likely to be, the necessity is met with the least possible offense from the means.

Is it possible to go further and make the poles beautiful by adding ornament? A wrought iron bracket is at once suggested, and the designer of the American ornamental poles is not behind hand. The description of these poles reads: "Under the arm projecting from the top to support the trolley wire, extending from the pole to the end of the arm, is placed an ornamental bracket of scroll work or other design."

It is extremely doubtful whether, even if properly applied, scroll work of one design, executed mechanically and repeated without variation, would prove to be a source of much pleasure. But this application — the only application we are likely to get in the case of trolley poles — reveals its lifelessness in the word "under." The brackets are to go under the arm. The arm will have a separate identity, and we may leave it to the electric railroads' engineer to make sure that it does not depend upon the bracket for support. The bracket will, in fact, depend from the arm. And the liberal effort of the railroad company to be beautiful will meet with indifference which, if anyone thinks about it at all, will perhaps seem unaccounted for. Old work of the kind, in the old world, interests them, and this does not. Is it because it is new? Not entirely. Age is an advantage, even to ironwork—in the slight irregularities that come from various causes. But there

is more than this. Old work had slight irregularities to begin with, because it was made by hand instead of mechanically, and by eye instead of on a pattern block. For this reason alone no two objects of a kind would be exactly alike, even if of the same pattern. But as there would be little to be gained by following the same pattern exactly, and much to be gained (for the workman as well as for the spectator) in varying the pattern, there would probably be no two exactly alike in design, and the interest would be far greater than when the same design is turned out by the hundred, because done mechanically. The chief reason, however, is that the old design was constructional. The bracket was not an ornamental addition to the arm; it was itself the arm. The top member was little, if any, thicker than the



Unsightly Telegraph Poles C-222

rest of the bracket. The scrollwork was simply a method of making a strong arm out of weak material. It is constructional ironwork; a small truss. This, recognized instinctively by the general public and consciously by persons experienced in design, is the bottom reason why old wrought ironwork of the kind is interesting and why a stout castiron tube, decorated underneath by a scroll of mechanical wrought ironwork will be a travesty, and its foolishness will be felt even by those who do not know wherein it is foolish.

A further question arises—whether, if the railroad company were zealous enough about beauty to have all its trolley arms made of true scrollwork, wrought by hand and of design varied as the fancy of the workman directed him; whether, in that case, complete satisfaction would be reached. Hardly, for here comes in another point of difference between us and earlier days. This was the mediaeval workman's natural way of accomplishing the end. He worked with small bars of wrought iron; we cast and roll iron of any shape and size, and the obvious way of making a trolley arm now is to cast a pipe of sufficient diameter and fit it into a socket on the vertical post. This is the basis of the modern designer's problem. If it is of no avail to make it beautiful by tacking the beautiful mediaeval structure underneath, it is equally a sham, though more difficult to recognize as a source of failure, to make a true design in the mediaeval manner. Assuming the work to be equally well designed and wrought, it must still be beautiful; but it has

ceased to be fitting. For strong practical work, many times repeated, castiron is the natural modern material, and though the wrought iron scrollwork arm may be true Gothic design, the man who does the work well in castiron is the true Gothic designer. In carrying out his work with the severe simplicity that the occasion demands, he is not out of spirit with the old workmen, who were not always florid, but gave us also the plain wall spaces and simple constructions that we envy, and who most likely, if they had been called upon to erect several thousand trolley arms in one city, would not have tried so hard as we think to direct attention to them.—Canadian Architect.

* * *

Proper Ventilation

ONE of the essentials of good health is pure air, and plenty of it. In order to enjoy this at all times it is necessary to have our buildings equipped with good ventilating systems. By a good ventilating system we mean one that will bring in 30 cubic feet of pure air every minute for every occupant of the room, and also take out the same amount of impure air. Several Eastern States have passed laws specifying that good sanitary heating, plumbing and ventilating systems be installed in all public buildings. This should be taken up by all legislatures, as it is something which is of vital importance to every State.

Many of our schools have poor ventilating systems, with the result that hundreds of children are breathing air loaded with poisonous gases. This can be very readily noticed by entering a large, well-filled schoolroom, where, if there is a good circulation of pure air, the air smells as pure as outdoors. If there is no circulation of pure air, the change is so great that it almost chokes one, and it has a strong odor. The children in this last room cannot help but get that languid, sleepy feeling which is due to the poison in the air.

It would be well for all legislatures to pass laws making it necessary to have good sanitary conditions in every public building, as there is nothing a growing child needs more than good, pure air.—American Carpenter and Builder.

* * *

Efficiency of "Fireproofed" Wood

SOME interesting conclusions are contained in the report on his tests of the fire resisting qualities of fireproof or non-inflammable wood, recently issued by Prof. Charles L. Norton, in charge of the Insurance Engineering Experimental Station of Boston. He says, among other things:

The attempts to render wood "fireproof," or, rather, fire retardent, are not of recent origin, but it has not been until the necessity arose of providing fireproof "trim" for buildings built otherwise of non-inflammable materal, that fireproof wood came to be made and put upon the market in quantity. Wood, being porous, it is possible to cause solutions to soak into it, and on drying, to leave a part of the dissolved salt in the cellular structure of the wood. The application of heat and pressure sometimes following exposure in a chamber at reduced pressure is the means often employed to cause the

solutions to enter the wood. It is in the method of treating the wood rather than the nature of the solutions used that especial excellence is usually claimed for one or another brand of fireproof wood. So far as the writer can find out without exhaustive chemical analysis, there is no great difference in the operation of the different salts with which the wood is treated.

One of the most serious objections to fireproof wood in the minds of many who have used it is the difficulty of preventing the salts used in the treatment from injuring the appearance of the varnish, especially in damp places. Of the several samples sent us from actual service, only one was free from this trouble, and that one had manifestly never been "fireproofed." Several pieces of fireproof wood placed in damp locations have shown a tendency to mold and effloresce, but it does not appear that their fire resistance has yet been materially diminished. In damp places the contact with fireproof wood increases the rate at which rusting of iron occurs, but for use in dry places there need be little apprehension on this point.

Judged by the average of all the specimens examined, it is clear that many sources of ignition which, while lasting only a few seconds, would set fire to untreated hardwood, must last at least five minutes to set fire to fireproof wood. The flame and radiation given off by fireproof wood is only a small fraction of that given out by untreated wood, and the chance of spread of fire along it from the heat of its own burning is almost nothing. The deterioration of the wood when kept in a reasonably dry place is shown by the specimens of the Electric Company at least to be almost nothing for a period of three years, and it is my opinion that when painted or varnished, or even when, like the specimens which were kept for examination in 1902, they are in the shape of rough lumber, the protection of the electric process is apparently permanent. No information is at hand, unfortunately, concerning the other processes on this point.

As has been said, the material taken from the buildings was, on the average, poorer than that sent by the manufacturers, but there were a number of pieces which were quite as well treated as the best sent by the makers. The best and the poorest pieces of the old material came from the same building and were represented to us as being the product of the same company. This calls attention to the difficulty of determining the quality of the material except by destroying it and makes it seem that the surest guaranty of quality must finally be found rather in that the product is the work of some firm or number of firms, whose name and brand carries with it absolute reliability, rather than to attempt to test any large percentage of it. There has been an uncertainty, apparently based upon experience, among the building trades as to the quality of materials which they have purchased under the name of fireproof wood that has hindered the use of it greatly, and that there is some basis for their suspicions is shown by the specimens examined.

It was noted all through the tests that the fumes of the burning wood were intensely pungent, irritating to the eyes and throat, and caused in the case of a number of persons exposed to them for some days acute illness for a short time. In case of fire it is probable that the firemen would find this smoke a hindrance in entering and working in a building trimmed with fireproof wood. The relative effectiveness of the treatment in use by at least one of the companies in 1902 and 1905 shows that the art has progressed and that the later specimens are more fire retardent than the earlier ones were when new or are at this time.

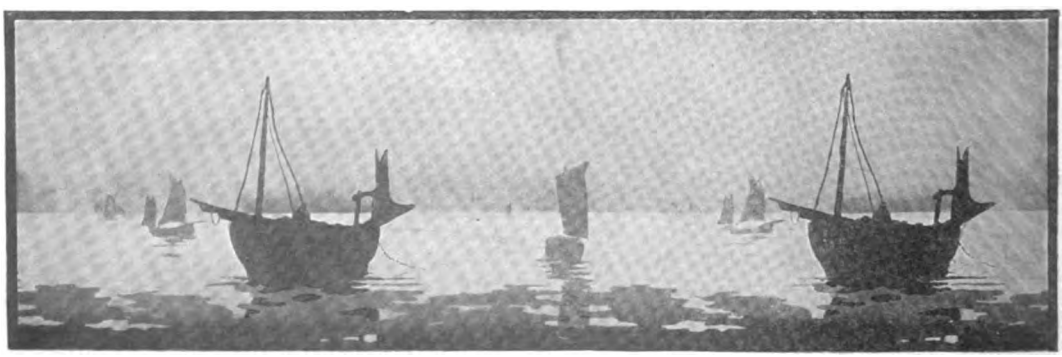
Plea for Better Construction

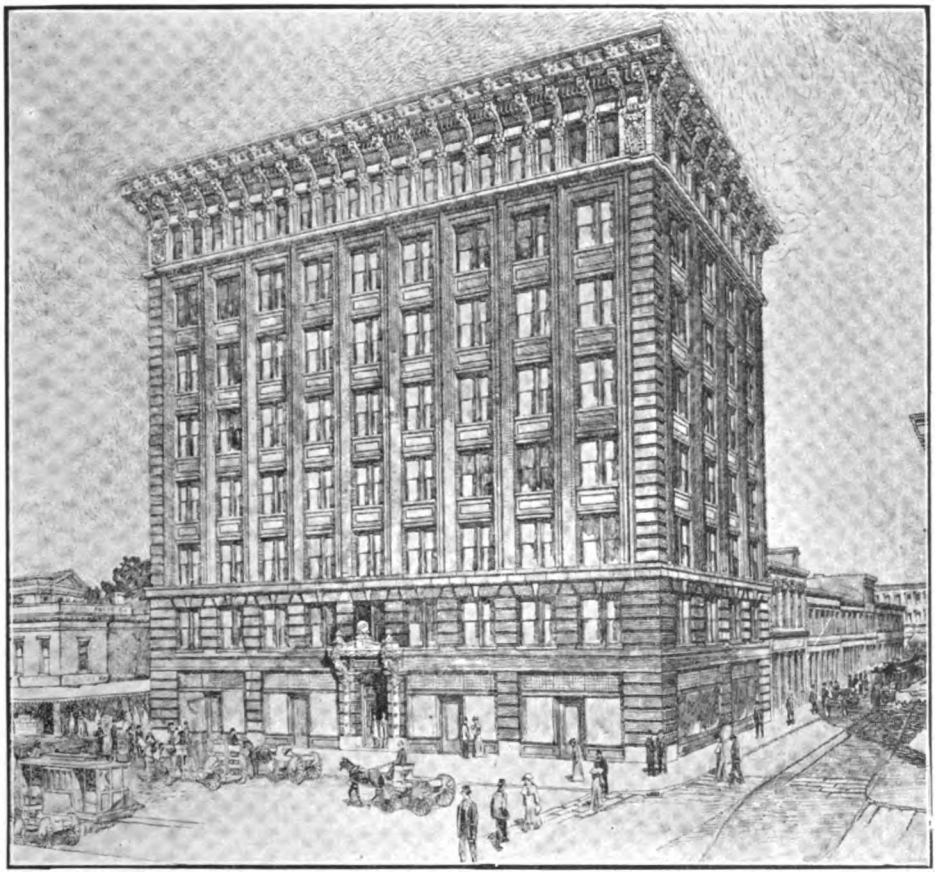
By F. W. FITZPATRICK in Fire-Proof Magazine.

TALKING about intelligence reminds me that there seems to be some opposition in San Francisco to the betterment of building regulations proposed by City Architect Shea. It is claimed that no improvement is required in building methods there, though it is notably a wooden city, and one of the arguments advanced in support of that contention is that the underwriters have made very low rates on San Francisco buildings because of the very great efficiency of the San Francisco Fire Department! By the same token, why should not the hotels in a low, miasmetic, typhoid, unclean, unhealthy place advertise it as a splendid health resort because of the high caliber of its doctors?

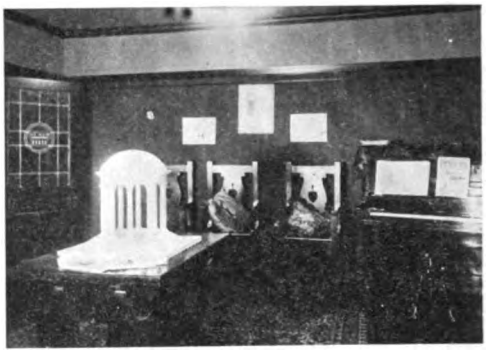
Speaking of San Francisco reminds me that I lately received a communication from an architect there calling my attention to a clipping from the Literary Digest of August 12th, that bemoans the tendency of present-day literature that seems to revel in showing us our sore spots, our corruption, graft and misgovernment. It calls it a tendency towards a "literature of exposure," and protests against it because a continuation in that direction is apt to surfeit us, accustom us to evil and make us look upon it as something ordinary, common, not worth while mending; that there is nothing constructive about that tendency. The writers but point out the evils, show up the wrongs, but suggest no cures, no reforms. My correspondent says he doesn't wish to hurt my feelings, but that that particular clipping, he thinks, applies to me. He thinks that in these and other columns I devote too much space and time to facts and figures demonstrating the wrongs in buildings, the ills that result from fires and poor construction, and such "literature of exposure."

Perhaps I am guilty according to the indictment, but I submit that if our Western friend will glance over my so-called literature he will find that with a very small proportion of exposure of destructive tendency, I have made it very largely constructive. Indeed, like a certain young gentleman who cried out in the desert aeons ago, my voice has been stridently raised in behalf of curative measures for the ills from which we suffer. I have harped consistently and persistently upon better construction.

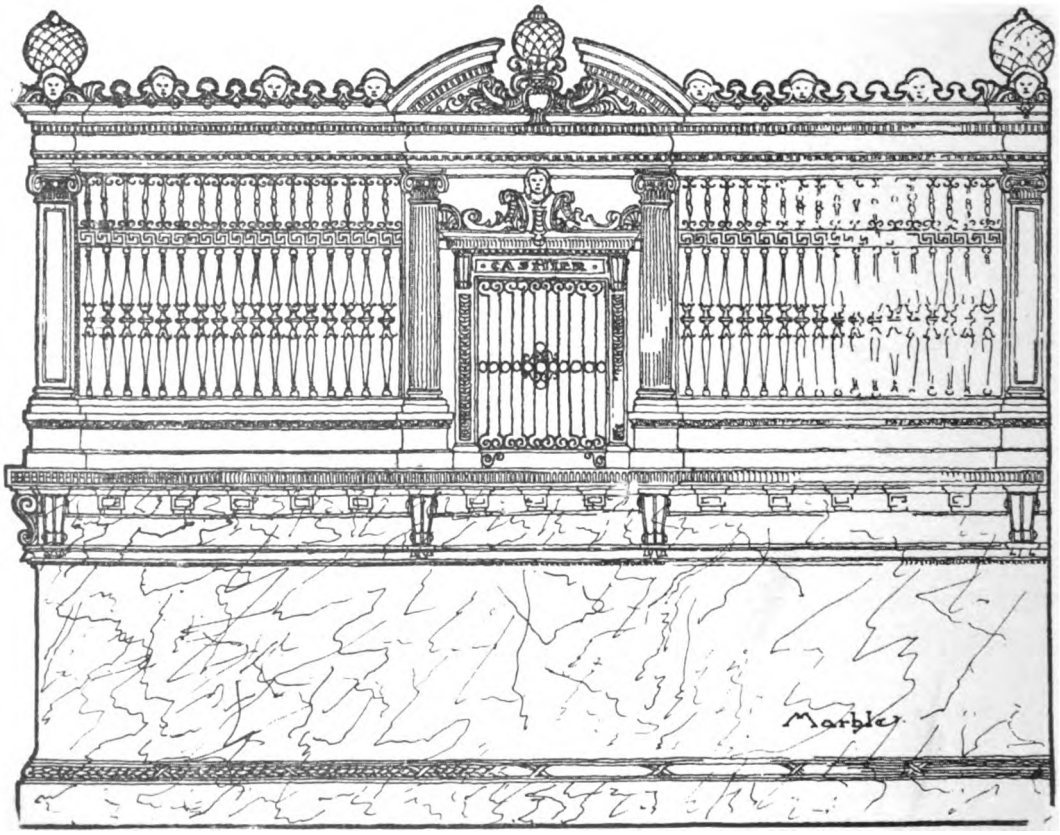




Cowell Building, San Francisco *Henry H. Meyers and Clarence R. Ward, Architects.* C-224



Interior Views of Club Rooms S. F. A. C. C-225



Design for Bank Grille *August H. Headman, Des.* C-226

Green Building, Fresno *E. Matheweson, Architect* C-227

Architecture in the Small City

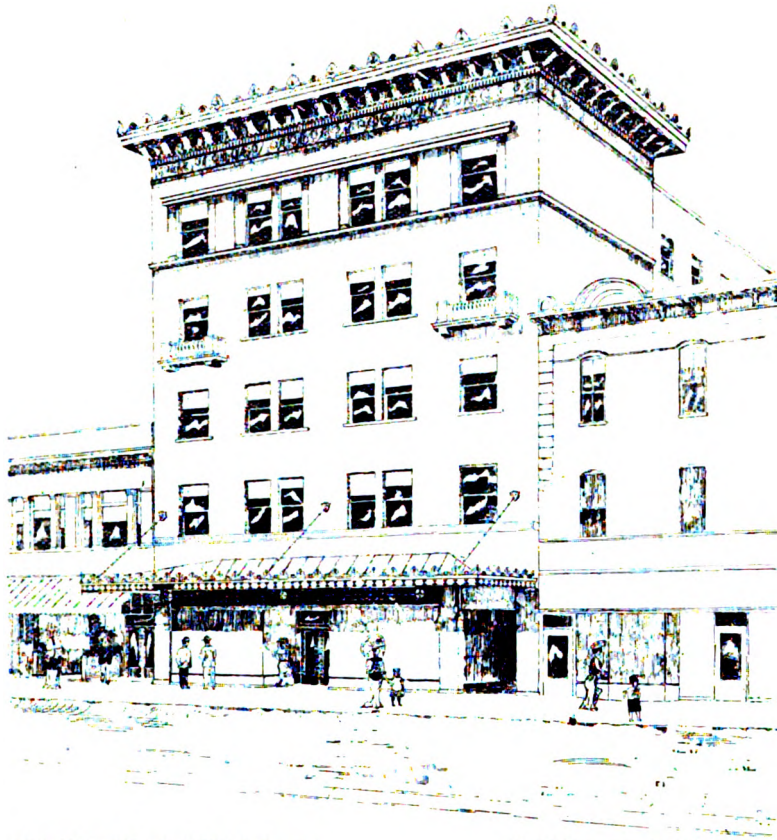
Substantial Buildings Are Fast Replacing Antiquated Structures—Fresno a Notable Example.

WHILE San Francisco and Los Angeles are forging ahead in the construction of great skyscrapers and other pretentious buildings, the smaller cities and towns of California are showing a proportionate amount of activity, and just as the massive fireproof building is replacing the early-time wooden structures in the large municipalities, so the two, three and four-story, and in some instances five-story buildings of brick and stone are supplanting the adobe or frame structures in the towns of modest population. It is a mistake to believe that only in the big cities are to be found examples of some of our best modern architecture. The fact is, some of the very best work of today is to be found in the small city, where one would least expect to find it.

One of the missions of the Architect and Engineer is to encourage new and better buildings in the small city. While to the architect and builder of San Francisco and Los Angeles the construction of a two or three-story brick building may seem almost trifling, still to the architect and builder outside the big cities an enterprise of the dimensions named is quite as important in his mind as is a million-dollar structure to the architect in a great city. Architects and builders, both big and small, take a deal of pride in their work and are pleased to have it shown to the world. In recent numbers of this magazine, buildings have been shown in San Jose, Sacramento, Santa Rosa, Oakland and Berkeley. In this number considerable space is devoted to Fresno, which is just now enjoying unprecedented activity in the building line.

Fresno Republican Building *E. Mathewson, Architect* C-228

Residence of F. K. Prescott, under Construction, Fresno C-229
H. A. Hansen, Builder *E. Mathewson, Architect*
Fresno Brick & Tile Co., Brickwork



New Grand Central Hotel, Fresno *E. Mathewson, Architect* C-230

The W. C. Colson residence is a very happy combination of interesting outlines, and the whole is most artistically treated. The exterior is frame work and is covered with shingles of a dark brown color. The roof is also covered with shingles and stained in a color to match.

The interior is trimmed in weathered oak. The living room, which is the important room of the house, occupies the front portion and is panelled six feet high and has a beamed ceiling with plaster panels. The ornamental stairs in an unobtrusive manner rise out of this room, for there is no hall. At the side of the stairway there is a seat, and on a line with the staircase is the large open fireplace of unglazed tile and a mantel of unique design.

The dining room is treated in a similar manner, with panelled wainscot and beamed ceiling. The second floor contains two large chambers and banquet room, all finished in natural yellow pine.

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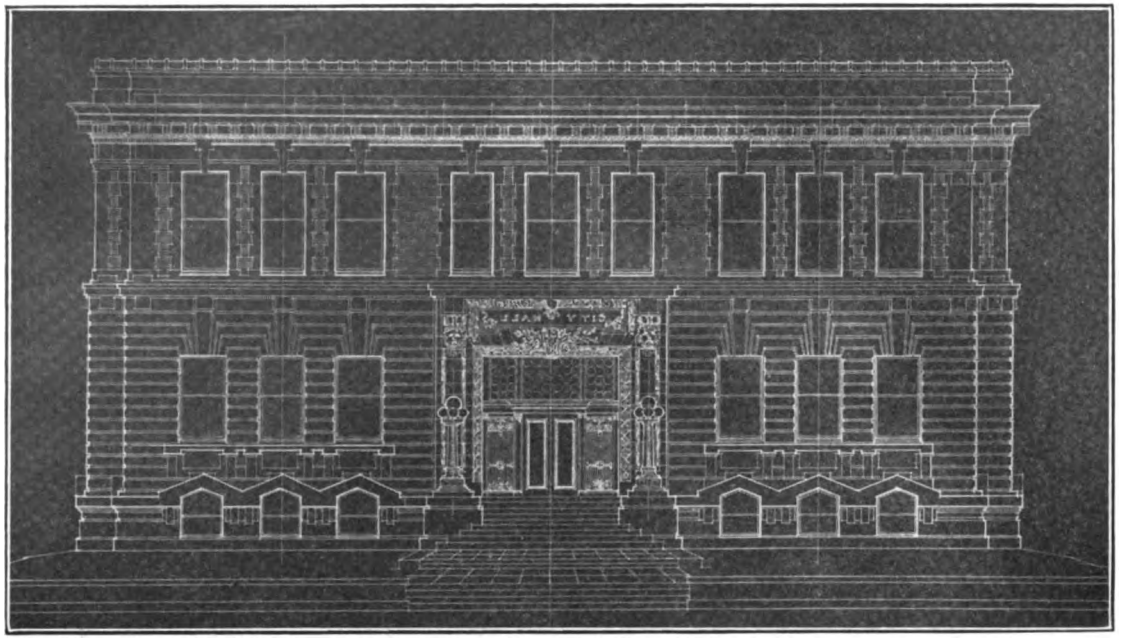
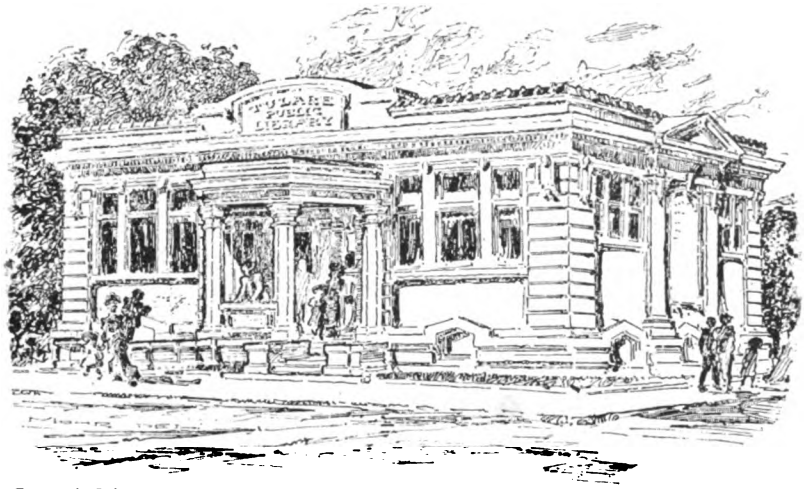
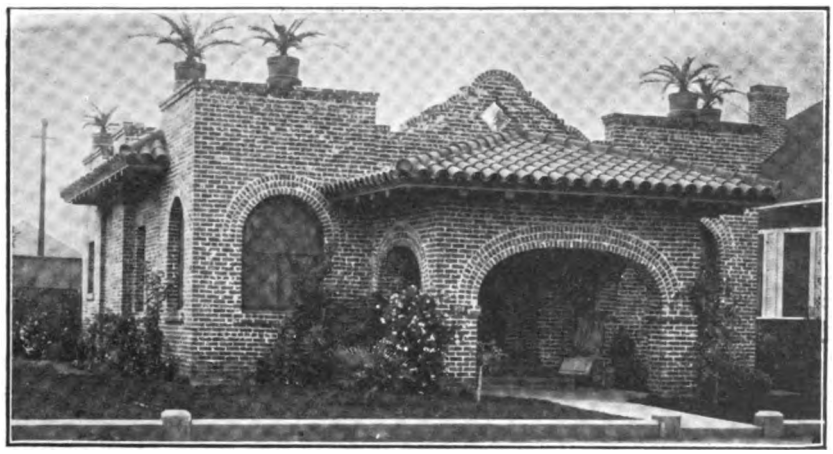
The First National Bank, occupying a floor space 55x100 feet, shows the change from a small country bank to one of modern convenience and facilities. The entrance room is finished in mahogany and has a beamed ceiling with ornamental steel panels. The columns are of steel supporting a brick wall, which formerly separated the two stores. The columns are encased in wood



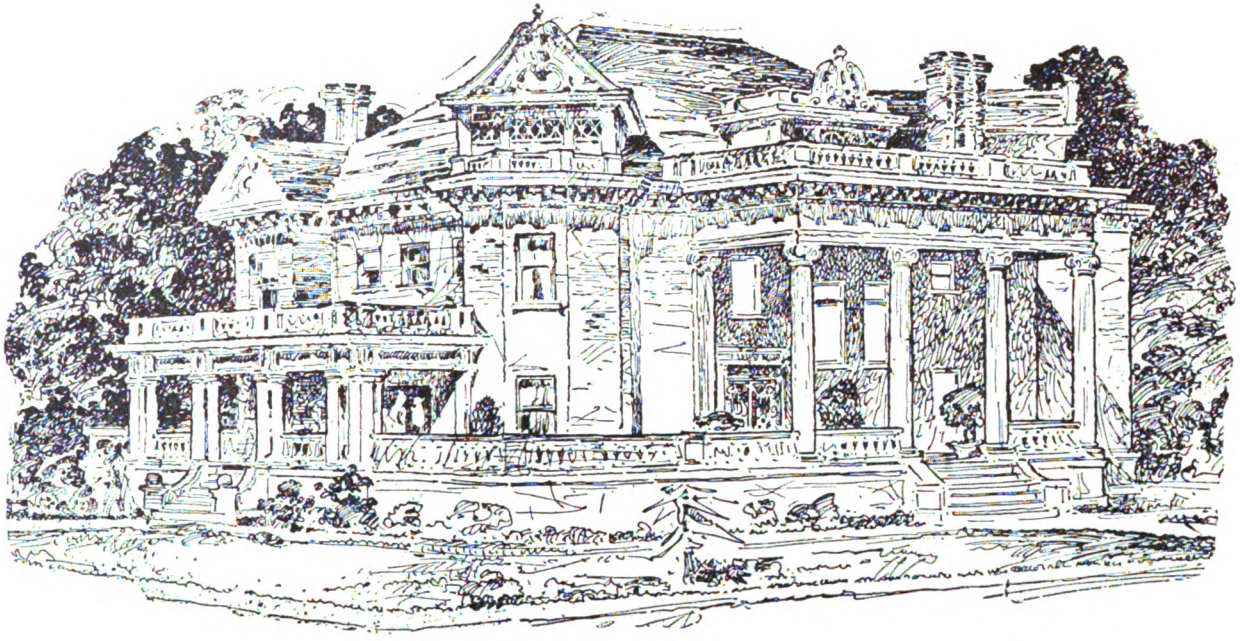
Accepted Design for Fresno City Hall *E. Matheuson, Architect* C-231



Carnegie Library at Tulare. *E. Mathewson, Architect.* C-232

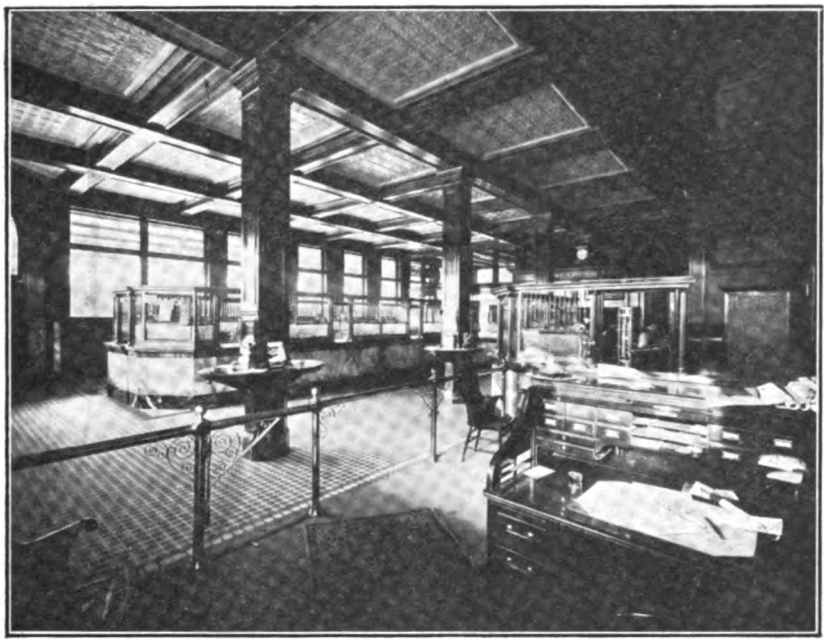


Residence of E. Mathewson, Fresno. *E. Mathewson, Architect.* C-233



Pen and Ink Drawing for Residence

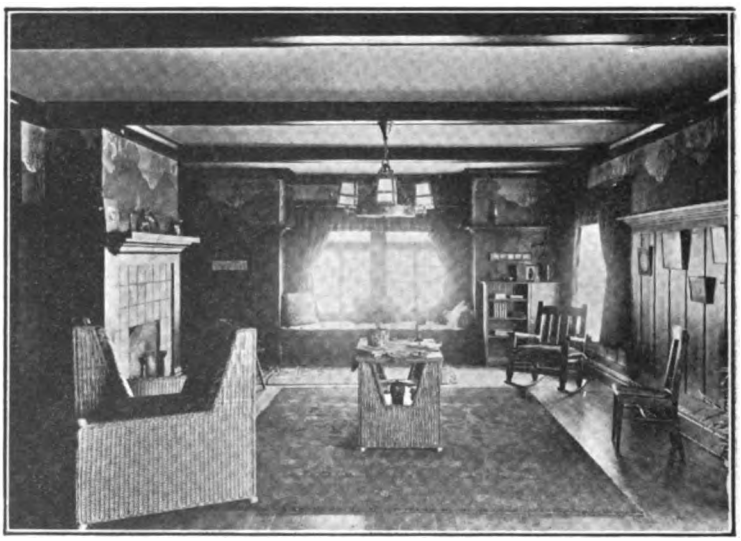
E. Mathewson, Architect. C-234



First National Bank, Fresno *E. Mathewson, Architect.* C-235
Rubber Tiling from New York Belting & Packing Co. *Marble Work by Doyle Bros.*

Dining Room of Colson Residence, Fresno *E. Mathewson, Architect.* C-236

Living Room in Romain Residence, Fresno *E. Mathewson, Architect* C-237



Living Room in Colson Residence, Fresno *E. Mathewson, Architect* C-238
H. A. Hansen, Builder

to match the beams, leaving no trace where the wall once stood. The entire room is wainscoted in marble the height of the banking counter. The floor is covered with interlocking rubber tile.

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The Fresno Republican Building, while not very striking in appearance, shows the first pressed brick and terra cotta building to make its appearance in Fresno County. The basement is occupied by the printing department, the first floor by the general offices and the second floor by the editorial rooms, etc., and offices for the use of the general public.

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Excavations for the Grand Central Annex have been started which marks the beginning of the erection of the first five-story building in Fresno. It is to be occupied as a first-class hotel in connection with the present Grand Central Hotel. It has a frontage of 55 feet and a depth of 150 feet. It is equipped with a combination baggage and passenger elevator. The entire building contains 88 rooms, with bath connection to each. Each floor has a public bath and public shower, which are very essential features in this climate. The exterior is finished in pressed brick and terra cotta.

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The Prescott residence is of the Colonial type modified to suit the needs of the warmer sections of the southern part of California. The building is constructed of red pressed brick. The woods, columns, pilasters, cornice and balustrade are all painted white, which is characteristic of this style of house. There are two entrance halls, a porch at each entrance being the exterior features and a very attractive bit of detail. The principal feature of the interior is the main hall. It is finished in black sequoia with a panelled wainscoting six feet high and large heavy-beamed ceiling. The attractiveness of the hall is enhanced by an alcove at the foot of the staircase treated with fluted Ionic columns and pilasters and provided with a panelled seat at the platform in the circular bay, up which the stairs rise. The living room is treated in mahogany and it contains a large open fireplace finished with unglazed tile facings and hearth and a carved mantel of excellent design. The dining room is trimmed in Flemish oak. It has a panelled wainscot five feet high and a heavy wood cornice. The feature of this room is the novel and unique sideboard with its rare bits of carving and bent plate and leaded glass doors. The butler's pantry and kitchen contain the usual up-to-date fittings and fixtures. The second floor contains four chambers with bath and dressing room in connection with each, all finished in white enamel.

✤ ✤ ✤

The residence of Frank Romain, while not out of the ordinary as far as exterior appearance is concerned, has as its feature the largeness of the rooms. The ground floor occupies a space 44x64 feet, and contains an entrance hall, living room, dining room, den and kitchen. The living room is 24x34 feet, panelled two feet high with a heavy cornice and finished in mahogany. The feature of this room is the large open fireplace finished with unglazed tile face and hearth and heavy terra cotta trimmings, with color to match the room. The dining room is panelled five feet high with heavy wood cornice, and as a predominating feature the sideboard excels all others. The room is finished in Flemish oak. The den is finished in black sequoia and the entire second floor is finished in yellow pine.

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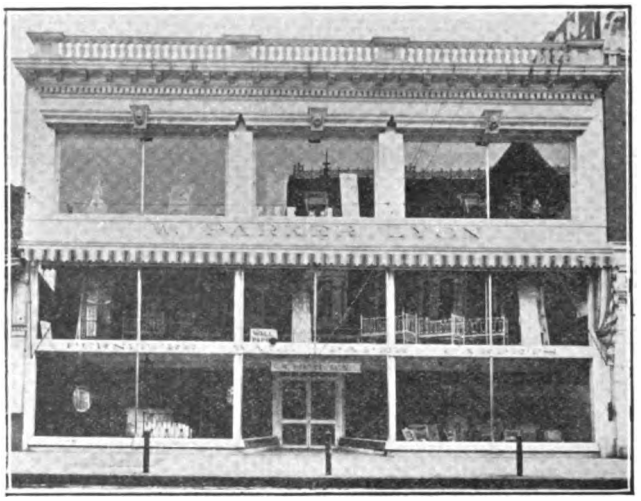
The accepted plans for the Fresno new City Hall calls for a building to occupy a space of 80x100 feet. The basement is to be used and fitted up as a city jail with all the latest steel cells and fittings and police headquarters. The first and second floors contain the city offices, police court and public meeting rooms. The exterior is to be of pressed brick.



W. Parker Lyon Building, Fresno *E. Matheweson, Architect* C-239
Emmett Riggins, Builder

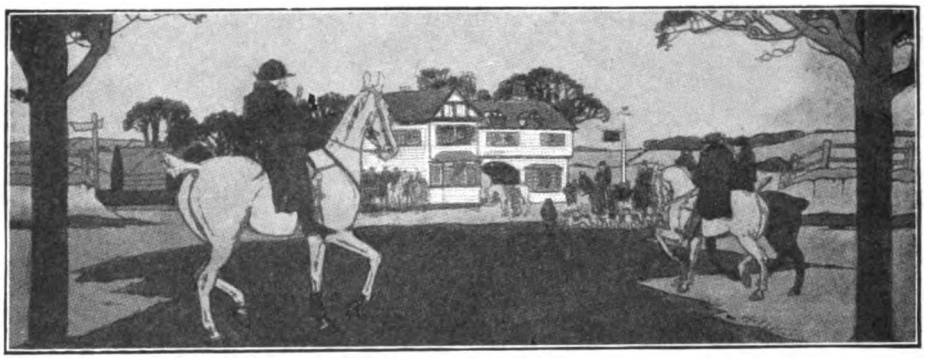
Dining Room in O. J. Woodward's Residence, Fresno *E. Matheweson, Architect* C-240

The Arrangement of Rooms

ONE of the perplexing questions of house-furnishing is the arrangement of the furniture—how to place the various pieces in order to obtain the best results. If the room under consideration is the library, where shall the bookcases stand? Where place the reading table? How locate the chairs? If the room is the dining-room, how arrange sideboard and serving table and other pieces so that comfort for the family and convenience for the servants are obtained? If the room is a sleeping apartment, how dispose the furniture so that light, air and privacy are secured?

Oftentimes when the library, living room and dining room are faultless, the bedrooms of the house are lacking in any plan or forethought in the arrangement of the furniture. The bed faces a window, making sleep impossible after sunrise, or the dressing table is in a dark corner, where little light is obtained. Something is lacking in the general scheme. Guest rooms are usually the greatest offenders against comfort, for they are seldom occupied by the members of the family, and thus their various shortcomings are unnoticed. A polite guest does not care to draw attention to the negligence of his hostess or the oversight of the architect. The latter is, of course, not responsible for the location of the furniture, unless he has provided insufficient wall space, which is an occasional architectural sin. Where a room is so cut up by doors and windows that the only available space for the bed is opposite a window the architect is largely to blame. If the exposure be an eastern one the annoyance is deep-seated. Heavy shades are seldom sufficient to shut out the early morning sun. Again, in shutting out the sun the direct means of air may be cut off also.

Hall in Buker Residence, Fresno E. Mathewson, Architect C-241
F. J. Stone, Builder



Interior Decoration Up-to-Date Furnishing

The Wall-Paper Dealer

By C. WALTER TOZER

THE selling of wall-paper is not mere merchandise. It is an important—indeed, a conspicuous factor in the decoration of the house, for the reason that it covers a wide expanse of decorative thought, and unless the work is intelligently undertaken, is a positive offense to the eye.

The wall-paper dealer must acquire a proper knowledge of applied decoration. This is an age of specialization. People who buy furniture or upholstery goods or wall-paper, especially where much money is involved, wish to deal with a specialist. Where there is no specialist the customer naturally drifts to the decorator. The decorator is not always a superfluity. He is a necessity where the customer hardly knows what he wants and wishes one mind to supervise all his furnishings. But where the customer has a knowledge of his requirements he will go to the furniture man for his furniture, the upholstery man for his upholstery and the wall-paper man for his wall-paper.

The wall-paper dealer is certainly the specialist—the indisputable authority on the subject of mural decoration. Obviously he should know more of the subject than the man who knows a little of everything, such as the decorator.

The wall-paper dealer naturally has every advantage. He has the trade support and the public support, and it is certainly to the interest of the public at large to buy of the man with a big assortment. In this age of artistic house furnishings the public is quick to realize the inefficiency of a salesman, and the wall-paper dealer knows he can never hold the business until he is alive to the situation and carries a stock properly selected, properly displayed and properly presented.

Commercialism vs. Art

THE great purchasing public, upon which the decorative trades depend, comprises four distinct classes, for which they are four distinct mediums of supply:

(a) The utilitarian class—the unthinking multitude who call for no more art than you find in the stuffed pig of the delicatessen shop. In every city and town we find cheap merchandise shops with "bargain sales" to supply this class.

(b) The other extreme—people pre-eminent for wealth, who employ the decorator of repute, with name prized like the stamp of a high-class jeweler on silverware—giving a pleasing, if sometimes fictitious value on his work.

(c) For the class next below in wealth, though frequently superior in culture, there is the decorative firm lacking fame, but able to produce artistic results, working often in close consultation with customers.

(d) Perhaps the most important of all are those of the vast middle class, educated, acquainted with much of the best that has been done in art and decoration, but willing, even eager, to exercise their own taste, and insistent on a comprehensive stock of goods to select from.

The firm having a stock that will appeal to this class holds a position analogous to that of the picture gallery. The connoisseur who would buy a picture may go to the studio direct, but the probabilities are that he prefers some reputable art gallery. Such a gallery has succeeded in attracting the intelligence of the country by maintaining a high standard, and there is no reason why the merchandise wall-paper man cannot accomplish the same results. It is difficult of attainment, however, if his stock has to be "turned four times a year," if he has to "mark down" the goods that lag superfluous on his shelves. In other words, if he has to commercialize art. The thing that is right will always sell when needed. Why sacrifice it?

It seems folly to presume that every firm can do a high-class business. Nevertheless we claim that within the means of their clientele all firms can follow along a high artistic plane. Show us the men who follow this theory and you have the men who succeed. Show us the men who sacrifice all to mere commercialism, and they are the unsuccessful men, the underpaid, the disengaged. You cannot sell art by the pound or yardstick, and you cannot force it. Decoration in its best form awaits opportunity. You cannot make the opportunity beyond attracting the attention of the class where opportunity exists.—From the "Wall Paper News and Interior Decorator."

* * *

Bathroom Wall Papers

Bathroom furnishings are of vital interest to the housekeeper, for a well-equipped bathroom is the hallmark of respectability.

If expenses must be curtailed in other parts of the house, this room, at least, should be as comfortable and attractive as the family purse can make it; not necessarily marble walls and sunken tubs, but a place where light, air and cleanliness are supreme. Light and air are supposedly within the reach of all, yet from the way we shut them out from our bathrooms they might well be within the reach of millionaires alone. We put a premium on sunshine and use air as gingerly as if it were weighed in gold.

All the books on sanitation, all the lectures on home economics, are as naught so long as we fail to put into every-day use the A B C's of sanitary living.

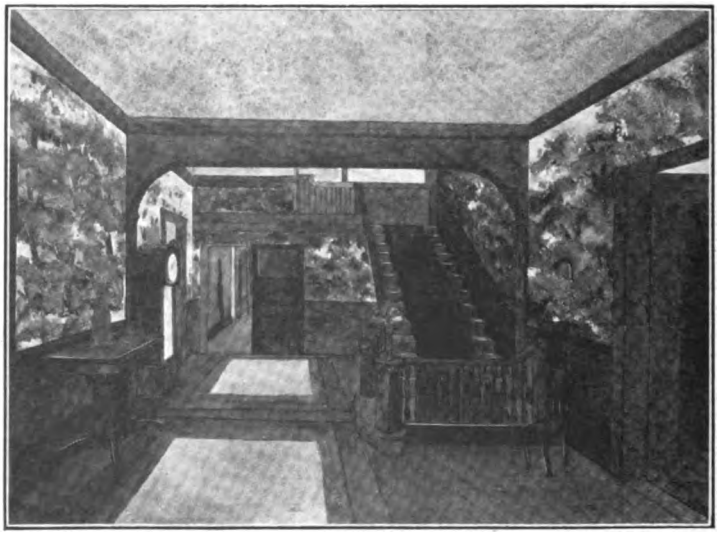
The bathroom is a good place with which to begin the crusade. The question of the tub need not now be considered, nor the floor, although these are important.

The tub and its various appliances are often provided by a previous householder. The floor is likewise in place. The general arrangement of the room is often beyond changing. But the walls, often the most perplexing feature for the room, are ready for treatment.

Fortunate the housekeeper who can tile her bathroom walls. She can obtain such cool, watery effects and rest secure that no amount of splashing can mar the surface, no steam penetrate the glaze, no sun fade the colors. Where tiles are impossible, there are many attractive substitutes. Tiled papers are not of this class. They are more effective in kitchens than in bathrooms. Glazed papers of various design are made especially for bathrooms, and these are excellent for one year's wear. Where there is a high wainscot, paper will wear longer. The principal thing is to protect the walls where the wear is hardest. This is sometimes attained by tiles, sometimes by paint and again by a wainscot. Where paper is used from baseboard to ceiling, it is well to treat it to a coat of white varnish. A glazed paper will not need this at first, but the paper of usual finish should be varnished as soon as it is in place. It is surprising to see how effective many comparatively uninteresting designs become when coated with glaze. Lifeless colors become bright, while gay colors grow even more brilliant.

Where tiling is used, an "all-white" bathroom is most desirable, but where paper is preferred, color has its place. In planning the scheme, the adjoining room should be taken into consideration, unless the bathroom is detached, when it may be decorated independently.

Among attractive bathroom papers is a pond-lily design, as cool and watery as a lily pond. Another effective pattern is the wild iris with long, straight leaves. Good effects may be gained by trellis and lattice papers. These are especially effective when hung above a wainscot and carried over the ceiling. The main thing is to choose a simple scheme and stick to it. Elaborate results are not desirable in a bathroom.—House Beautiful.



Suggestion for a Hall. *L. Tozier & Son Company.* C-242

Among the Architects

Information contained in this publication is gathered from the most reliable sources accessible, but to make it absolutely accurate the publishers urge the co-operation of the members of the profession :: :: ::

It is said that another skyscraper will be built on Spring street, in Los Angeles, at the southeast corner of Fifth street, having a frontage on Spring street of 120 feet and extending 159 feet along Fifth street. It will be the limit in height allowed under the building ordinance—150 feet. This will be divided into ten or twelve stories. The building, which will be built by a syndicate of Los Angeles capitalists, among whom are R. A. Rowan, A. C. Bilicke and J. F. Sartori, will cost $1,200,000. Architect John Parkinson has been selected to draw the plans for the structure.

A five-story and basement store and office building, 70x165 feet, is to be erected for M. A. Newmark on his lot, 50 feet south of the Lankershim Hotel, on South Broadway, Los Angeles. Work will be begun at once and the building will be occupied by Z. L. Parmelee & Co.

Architect A. F. Rosenheim of Los Angeles has been on a tour through the East to inspect Christian Science temples, in view of the construction of a temple on West Adams street by the Second Church of Christ, to cost about $200,000. Mr. Rosenheim has recently been appointed architect for the Hamburger department store to be erected on South Broadway. This building will be five stories in height, with a ground space of 70,000 feet.

Carl Leonardt has been awarded the general contract for the construction of the Majestic Theater and office building on Broadway, between Sixth and Seventh streets. The contract was let from the office of Architect Rosenheim for $450,000.

Clayton D. Wilson, one of the best-known architects on the Pacific Coast, has had his plans accepted by the Seattle Board of Public Works for a new municipal building to be erected in the Puget Sound city at a cost of $175,000.

Mr. Wilson is talked of favorably for superintendent of construction, and if the board selects him for this work it will mean an additional 1½ per cent of the total cost as personal remuneration. His plans draw the 3½ per cent usually charged, and both items will bring his cash total up to $8,500.

The Seattle Post-Intelligence pays Mr. Wilson a fine compliment. It says: 'The winning man is comparatively new among the list of city architects, coming here recently from Los Angeles, where he was engaged for a number of years in business. He has done considerable work of note, however, having drawn the plans which were accepted for the local Temple de Hirsch, to be located at Boren and Columbia. Since coming to Seattle he has also turned out the plans for nine brick buildings, which were erected at Aberdeen after the fire that destroyed the business section of that town, besides the Greenburg block, in Everett, and other structures.

"In Los Angeles Mr. Wilson submitted successful plans for the Laughlan block, on Broadway, between Third and Fourth, a six-story fireproof structure, and other prominent buildings in the Southern California metropolis."

* *

It is reported that a site for the first Buddhist temple ever built in the United States has been selected in Los Angeles. The funds required are on hand, and work on the building will soon be started.

THE

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Vol. III. NOVEMBER, 1905 No. 1

EDITORIAL

BLOW FOR LAWYERS

Lawyers seem to take such special delight in making unfortunate architects bear the full burden of the blunders for which they are responsible, through giving misleading advice to their clients, says an exchange, that many an architect has envied them for the way in which they themselves seem to escape all accountability for their own errors of judgment. Many an architect will rejoice to learn that the tide is turning, for the Supreme Court of Germany has recently declared that a lawyer is liable for the legal consequences suffered by his client through having acted on incorrect legal advice carelessly given. The injured client, be it observed, must prove the advice was given carelessly. The court reasons that, by accepting pay for his advice, the lawyer assumes the position of a debtor to his client, and unless he discharges the debt with due care, he must be responsible for the results. When this new precept obtains in this country, lawyers will perhaps be less willing to encourage architects to embark in lawsuits they are sure to lose.

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MUST HAVE BEEN A FEMALE

The wits of the daily press have been making much, and amusingly, of the fact that some clerical critic had discovered that Mr. Gutzon Borglum, sculptor, had modelled as feminine all the angels to be used in decorating the Belmont Chapel of the Cathedral of St. John the Divine, in face of the fact that Holy Writ states that two of them, the Angel of Annunciation and the Angel of the Tomb were males.

The sculptor, although he could marshal to his support abundant testimony that angels have almost universally been assumed to be feminine, has waived this point, and in smashing the two figures has destroyed real works of art and made fruitless many an hour of his own patient and loving labor.

The incident has a permanent value in drawing attention to the greater potency of the graphic over the verbal arts, when it comes to imparting information to the young, says the American Architect. It was our fortune to be brought up, in the matter of instruction in religious art, on a large assortment of illustrated Bibles and Mrs. Jameson's "Sacred and Legendary Art," and, quite apart from what the text actually declared to be the case, we can now conceive that, while it was plain the angel with whom Jacob wrestled must have been a male, our own sense of modesty must have conceived us that the Angel of the Annunciation, at least, was a female, and from that day to this the wrestling angel and Raphael's Michael have been for us merely the exceptions to the rule.

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TAXES ON FIRE-PROOF BUILDINGS

It is gratifying to note that owners of new buildings are at last beginning to realize the economic features of a strictly fire-proof structure. They have been slow to reach this conclusion for various reasons, the chief one of which has been the added expense. But now that the extra cost of fire-proof construction has been reduced very materially the owner no longer can complain seriously of the increased financial burden. Then again, there is a growing inclination to give the owner of a fire-proof structure the benefit of reduced taxes. And why not? A modern fire-proof building serves to protect the whole district in which it is situated. It forms a fire wall which makes it easy for firemen to use as a base from which to operate in checking a conflagration. In Paris steps have already been taken to remit taxes on the best designed buildings, the rebate being made up by adding a corresponding sum to other buildings less secure from fire. It strikes us that this same plan could be adopted here with very satisfactory results.

ARCHITECTS SHOULD SIGN THEIR WORK

The President of the Architectural Association, Mr. E. Guy Dawber, in his annual address, expresses the opinion that there is every reason why architects should "sign" their work after the manner of painters and sculptors everywhere, and in consonance with the modern custom that prevails quite generally amongst architects in Paris and elsewhere on the Continent. The American Architect and Building News comments that it is curious that, when professional opinion both in England and in this country is so generally favorable to this proposed custom, it should make such slow headway in both countries. We agree with the American Architect that the name of John R. Thomas, Architect, modestly cut on a stone in one of the basement courses of the New York Hall of Records adds distinctly to the interest and value of the building, and is in better professional good taste than if found on a bronze or marble tablet inside the vestibule, companied with the names of mayor, aldermen, contractors and politicians.

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THE BRICK OUTLOOK

Notwithstanding the growth of the cement block industry, the brick-makers report every prospect of a record breaking year in 1906. According to the "Clay Record" the outlook for the manufacture of brick-making appliances and the manufacturer of brick as well never was better and unless all signs fail the next season's business will be greater than any season in the history of the trade.

Sunset Magazine, published by the Southern Pacific Company, is spending $100,000 advertising "The Road of a Thousand Wonders," which begins at Portland and terminates in Los Angeles. A most interesting article, describing the country reached by the railroad journey from the two points named, with artistic illustrations, has just been published, and copies may be had free by addressing Charles S. Fee, Passenger Traffic Manager, Southern Pacific Company, San Francisco.

The Publisher's Corner

Herewith is shown a photograph of the Porteous Building, designed by Architect Mathewson, of Fresno, and considered one of the most substantial buildings in the city. The brick was furnished by C. J. Craycroft & Son, one of the leading manufacturers of the clay product in Fresno county.

Among the other buildings for which brick have been supplied by this firm are the following: Dunn, Republican, Blasingame, Green, Morgan, Consumers' Ice Company and the Ball-O'Neill Annex. Under construction at the present time are the Grand Central Hotel Annex and the F. J. Dow residence. Something like 4,000,000 brick were required in the construction of the above buildings, and all of this work has been done from Mr. Mathewson's office in the last four years.

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Reed Bros., contractors, of Fresno, are building a handsome bungalow in Fairfield for R. D. Smith. They are also building a house for Milo Rowell and have finished a fine residence for Adolph Bracker and an engine house for the city of Fresno.

About Hard Wall Plaster.

About twenty years ago the supervising architect of the government treasury department, recognizing the merits of hard wall plaster, adopted it exclusively for all buildings in his department. Since that time the war department has also used it to the exclusion of other classes of plaster, so that in a pronounced sense it has rapidly gained attention and use until most buildings in the Eastern States use no other, nor is any other plastering considered.

While the plastering is one of the most important parts of the modern building, our architects on this Coast seem slow in examining into its merits, and specifying hard wall plaster. A few of them, however, have done so, using it in the more important buildings, such as the Mutual Savings Bank, Merchants' Exchange, Mercantile Trust Company Bank, Italian-American Bank, Buckley building, all the theater buildings erected in the past few years, and a number of other structures—all have used the Empire hard wall plaster, manufactured by the Empire Plaster Company. Singularly our architects are slow to specify it for residences, where its use is more important

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Contents for December

A. P. Rosenheim

The Architect and Engineer
Of California

VOL. III DECEMBER, 1905. NO. 2

The Manufacture and Application of Glass in Art and Decoration

By WILLIAM SCHROEDER

TO describe how art glass is made is the purpose of this article, but before entering upon the subject of art glass, it will be proper to review in brief the history of the art of making glass from its inception.

Unlike that of pottery, which had been discovered and practiced by different nations independently, it seems to have spread from a single centre. The credit of the invention is given by the ancients to the Phoenicians.

A German Design. C-243

As the story goes, some Phoenician merchants rested their cooking pots on some blocks of natron (subcarbonate of soda) they found glass produced by the union (under heat) of the alkali and the sand of the shore.

Historians give Egypt the credit of having invented it, and that the Phoenicians derived their knowledge from there. Whether this be so or not, they certainly employed it from a very early period and to a very large extent.

The earliest specimen of glass now in existence is at the British Museum. It was found at Thebes, and consists of a small lion's head of opaque blue glass of very fine color, but changed externally to an olive green. According to hieroglyphics on the same, it dates from the year 2483 B. C.

The exact date of the use of glass for windows is not known, but the use of it for that purpose was gradually extending at the time when Roman civilization sank under the torrent of German and Hunnish barbarism. Mica alabaster and shells were used (also at that period) for admitting light into buildings.

Glass used in windows was cast on stones at that time, and the panes or

Design for Small Window C-244

lights were but small and of irregular shapes.

The largest pieces of window glass dating from the fourth century A. D., were not longer than about four by six inches, of an uneven thickness and yellow-greenish tint.

Its surfaces were wavy, full of wart-like irregularities, and the body contained innumerable large and small bubbles; although admitting light, it gave at best but an indifferent view of external objects.

When windows were larger the small lights of glass were set in pierced slabs of marble or in frames of wood or bronze.

Window in the Columbarium of the Odd Fellows Cemetery, San Francisco C-245

In those early times glass was used more extensively for ornaments, such as vases, urns, cups, etc., but as this is not exactly in line with the object of this article, I shall dispense with it, and continue with what we really want to consider, namely, glass for architectural purposes, but especially the ornamental or art glass, that is translucent.

Christ and the Innocents C-246
(Window painting by J. Brouchoud)

Up to the twelfth century only four different colored glasses for use in windows were generally known. They were red, blue, yellow and bottle green; at the last-named period an intense green and violet were added.

Glass was largely used in the immense windows of the churches of Rome (although as stated above the individual lights were very small), built between the third and tenth centuries. In the earlier part of this period most of it was probably colorless. The first mention of colored glass in a church window occurs in the time of Pope Leo III. (795-816), but probably it was used at a much earlier date. In Persia, where the manufacture of glass had been carried on for many centuries, stained glass was also made, for in the tomb of Shah Abbas II., who died in 1666 at Kom, the windows were crystal, with gold and azure ornaments.

About the middle of the fourteenth century flashed ruby glass was invented. This was made the same way as now, the glass blower taking a lump of clear, molten glass on his blowpipe, and then inserting the same in the pot where the red or ruby glass was contained, and by blowing it the same as if only one material were on his pipe, a thin film was spread over the clear glass, which now had assumed the shape of a large bottle. The top and bottom were knocked off later, and then the bottle was heated again, cut longwise with a diamond and spread on an iron table, thus producing a rich translucent ruby glass.

Before this invention, the red or ruby glass was too opaque, and for that reason was seldom used.

In the fifteenth century blue and flash glass was also made.

Until the latter part of the thirteenth century Venice had been the principal place for making glass, but at that time the glass houses were almost entirely transferred to Murano. At that place the first glass mirrors were made in 1317. Glass was made in France, Spain, Germany and to some ex-

The Vision of St. Mary Margaret of Alacoque, from a painting by M. G. Borehaw, head designer, California Art Glass Works

C–247

tent, also, in England, during the Roman Empire. In the last-named country it must have been of an inferior quality, for as late as 1447 glass is mentioned in a contrast for the windows of the Beauchamps Chapel at Warwick, but disparagingly, as the contractor binds himself not to use it.

However, later on, England came to the fore, for we find that in the seventeenth century an important innovation was made, namely, the introduction of flint glass, made by using a large proportion of oxide of lead in combination with potash.

The Good Shepherd C-218

The following are bodies capable of yielding transparent glass:

Acid	Alkaline	Earthy: Coloress	Earthy: Colored
Silicia	Potassium	Oxides of Lead	Oxides of Iron
Boracic acid	Sodium	Calcium	Manganese
		Barium	Copper
		Strontium	Chromium
		Magnesium	Uranium
		Aluminum	Cobalt
		Zinc	Gold
		Thalium	Silver

Either of the acids (silica being in the form of sand or crushed quartz), either or both of the alkalines, and a combination of the colorless oxides, are used to make clear glass, by fusing them at a very high temperature, in a melting pot or crucible. Colored glass is made in the same way, with the exception that colored oxides are used. Oxide of gold produces the rich and beautiful ruby glass. Oxide of silver makes amber or gold stains; cobalt, sky blue; iron, a brown; copper, green, etc. At the present time antique glass is made in Germany and England.

It is a mistaken idea that the art of making this glass is, or has been, a lost one. It is the very reverse. Although they are imitating the old glass with all its imperfections, such as bubbles, streaks of color and variating thickness, they produce a glass far richer in tone and brilliancy of color than the ancients, not to speak of tints that they never dreamed of in olden days. This antique glass is very rarely used for anything else than figures; the flesh tints for heads, hands and feet and the other colors and tints for background, drapery, etc.

Antique glass is blown like ordinary window glass. This is the reason of its brilliancy, which the glass made by casting does not possess. It is also flashed in different colors and tints, one of the latter being very valuable for the figure painter. It is the flesh tint, enabling him to etch away the color where the hair, whiskers or eyes are to be, and leaving them clear, to paint them in their natural colors.

France produces some very fine pink and ruby mottled glass. It is very expensive and its use limited. England furnishes muffled glass in crystal and all colors and tints, also cathedral glass. While the former is blown the latter is cast on large iron tables and smoothed over with rollers while at a white heat.

The United States now surpasses any other country in the manufacture of gass for art purposes. This country produces all (with only two exceptions) the different kinds of glass mentioned so far, and of superior quality, and is the only country where the beautiful opalescent glass is made, either smooth surfaced, rippled or in granite style, from snow white in all gradations of the cardinal colors as well as thousands of different tints.

Only a few years ago I read articles in German art and glass journals, pooh-poohing the idea of using this glass for "art glass windows," saying that only a perverted taste could find any beauty in them; but they have been quickly converted, for every industrial art exhibition held in large cities of Germany since then has had more and more beautiful examples of windows

Painted Window C-249

The Three Marys at The Tomb C-250

made of this (only shortly before despised) material. The same journals are now praising it, and explaining that many new and striking effects can be achieved with opalescent glass impossible to obtain with any other.

Agencies for the sale of American opalescent glass are to be found in all large cities of Europe. The United States also take the lead in other diversified glass, of which I will name a few: Oridoyant, a coarse rippled glass; Meridian, a very brilliant wavy glass; crackled, which has the appearance of alligator skin, but not quite so rough; etruscan, which can be compared with freshly fallen hail upon a crystal sheet. All these different styles of glass are made clear as well as colored.

So far we have reviewed in a sketchy way the history and manufacture of glass, which is the principal raw material of the manufacturer of art glass.

Another material which is absolutely necessary for making art glass is lead. It is not only valuable for binding the different-sized pieces of glass together, but enhances the beauty of the same.

If two pieces of glass of different color or tint are placed side by side and viewed from the dark, the light passing through the glass into the spectator's eyes, the effect will be very unsatisfactory. Like magic this changes when a strip of lead is laid between the two pieces, each being luminous with its own individual color, yet blending beautifully with its neighbor.

The lead is also a great factor in bringing out the design in strong contours or outlines.

Lead in conjunction with glass was first mentioned by Leo, Cardinal Bishop of Ostra.

He describes the art glass in the windows of the St. Benedict Church, in the province of Caserta, Italy, which was rebuilt by the then Benedictine monk, and later Pope Victor III. in 1066, saying that the glass was bound together with lead and strengthened with iron bars.

Before that time all glass was set as before described in this article.

I will now proceed and explain how art glass is made, but I must disabuse the mind of my readers that may have an idea that the art is one easily acquired, for, to the contrary, it requires years of diligent study and especially natural talent and adaptability to master the art.

Aside from his practical accomplishments, the designer and painter on glass must be a student of the vast literature on old and modern glass painting.

I may remark right here that among the old publications on this subject there are many of second and third grade; not all, therefore, that is old is good.

Edmund Levy said in his celebrated work, "Histoire de la peinture sur verre": "De nos jours le peintre sur verre ne peut plus, comme autre foi, ignorer l'histoire de son art." ("Today the glass painter must not be ignorant, as heretofore, of the history of his art.")

William Warrington, in his work, "The History of Stained Glass, etc., London, 1848," goes still further in his demands for theoretical knowledge on the part of the glass painter, for he deems it absolutely necessary for him to have thoroughly studied architecture, heraldry and other auxiliary sciences.

The impression exists to a certain extent among the public that the price of art glass should be estimated like any commodity, but this should not be, for there is a great difference according as the best glass or an inferior material is used, or whether the inceptive sketch, the finished drawing or cartoon, the

selection of the colored glass, the painting and supervision of the leading, is done by a true artist or an inexperienced novice.

This explains the ofttimes seemingly great difference in price.

The tendency of many, when ordering art glass, to demand the cheapest is degrading to the art, and they themselves suffer to the extent that they must hear it from connoisseurs that it is an article of no value they have acquired, instead of a work of art, which grows on their regard as time elapses.

It is customary for the art glass painter to make colored sketches for windows, drawn to one-half or one inch scale; after these sketches have been accepted as satisfactory, if it is for a figure window, he makes a full-size cartoon on paper in crayon, showing all lights and shadows as well as the outlines.

Early Italian painters used smooth, whitewashed boards for this purpose, but now it is done on so-called eggshell surface paper.

The full-size drawing is laid on a thin and a heavy sheet of detail paper. Between the design and middle, as well as the lower paper, there are thin sheets of blackened paper; all these are fastened to the drawing table with thumb-tacks; then all the lines are run over with a finely-pointed ivory pencil; when done, the drawing appears on the thin as well as on the thick paper, the former being the working drawing for the leader, while the latter is cut up by the glass-cutter for his patterns to cut the glass to correct size and shape.

If the paper were cut with an ordinary knife or scissors the glass with the lead would work out too large. To allow room for the lead a two-bladed knife, with the blades set nearly one-eighth of an inch (the thickness of the core or heart of the lead) was formerly used, but the cutting is now done with three-bladed scissors.

The above processes have been accomplished under the supervision of the foreman of the lead room, who has full charge of the work under hand. By the aid of the small colored sketch he selects the different tints of glass from the stock-room; if in doubt he consults the artist.

The glass and working drawing are then given to the cutter, who lays the latter on the further side of the table and the former on his left side, so that the front part is clear for him to do his work.

He puts a pattern on a piece of glass (he also has the small sketch to see where the different colored glasses go), and runs around the edge of the former with his diamond, nipping off the superfluous glass with a pair of pliers.

Previous to the 17th century hot pointed irons were used to do the glass cutting.

When all the glass for one window has been cut the pieces are taken to the artist's studio; he fastens them with wax to an easel, the principal part of which is a large plate glass, in their proper places. This glass is set against a window, so that the light is transmitted through it, and the painting (outlining and shading) is done while the figure and surrounding ornamentation is in a position as like as possible to when finished. All light from any other source is carefully excluded.

It would lead beyond the confines of a magazine article to dwell upon all the details of the work done by the artist.

For monumental painting only two colors and one stain are used, the colors being black and brown, the stain a rich golden yellow. The first mentioned are for outlining and shading of figures, ornaments, leaves, etc., and

the latter for the halo or wherever deemed necessary by the artist to make the window perfect.

For this style of painting no other colors are required, as the glass selected already contains them. It was colored while a molten mass with ingredients mentioned previously. Glass made in this way is called pot-metal. Some few colors that are used in such a window are flashed as previously described, and contain more or less shading, which of course requires very little work by the artist.

As the name indicates, the style of painting just described is for churches and other monumental buildings, but very seldom used in residences, or if so, in conjunction with mosaic work.

In cabinet painting (picture en appret) all colors and tints may be utilized. As this style of painting is done on clear glass it is appropriate for the windows from a short distance. Portraits, landscapes, etc., can be painted in their natural colors.

Many authorities condemn this style of glass painting for various reasons, principally because it is not in line with old traditions of the art, but further on the reader will find the true reason why the ancients did not employ more colors. One objection which, to my mind, is well founded, is that many parts of such a painted window are transparent; objects such as houses, passing clouds, etc., can be seen through them, thus marring the effect of the picture.

To some extent it is an oil painting on glass.

The ancient glass painter had but few vitrifying colors at his disposal, and these he generally prepared himself. The modern artist gets his colors just as the portrait or landscape artist gets his, all ready for painting. Flesh, as well as other tints, must be mixed, so that, when coming from the fire, they are as near to nature as possible; and this is the greatest difficulty, for a great many of the glass colors appear entirely different before and after the firing.

Mosaic art glass, without the aid of any painting whatever, is the most modern opalescent glass, with its magnificent iridescent colors, enabling the art glass maker to produce the most wonderful creations.

Marine scenes, in daylight or at night, landscape, flowers, arabesques—in fact, there is no limit, except the artist's fancy, as to what can be reproduced from nature or imagination.

Several years ago the opalescent glass makers added another material for the making of art glass; this is drapery and wing glass, the former for the drapery of figures, and the latter for wings of angels.

This glass is made by imitating, while in a half molten condition, the folds of cloth and feathers of wings, with iron tools, the side resting on the steel table remaining smooth (for this side it is cut with a diamond); while some of the folds are sometimes an inch or more in thickness. It requires quite a stock of this material to select the proper pieces for the desired effect.

The process of firing is one that requires a great deal of skill and careful attention, for if not properly done, all the preceding work on the glass may be for naught; if the manipulator gets too much heat on the same, it necessitates repainting them entirely; but it is worse if the fire has not been strong enough, for even the glass has to be renewed.

When the firing is successfully completed, the glass is taken to the lead room, where all the pieces are set together with came or glazier's lead. These are strands of lead with a groove on either side.

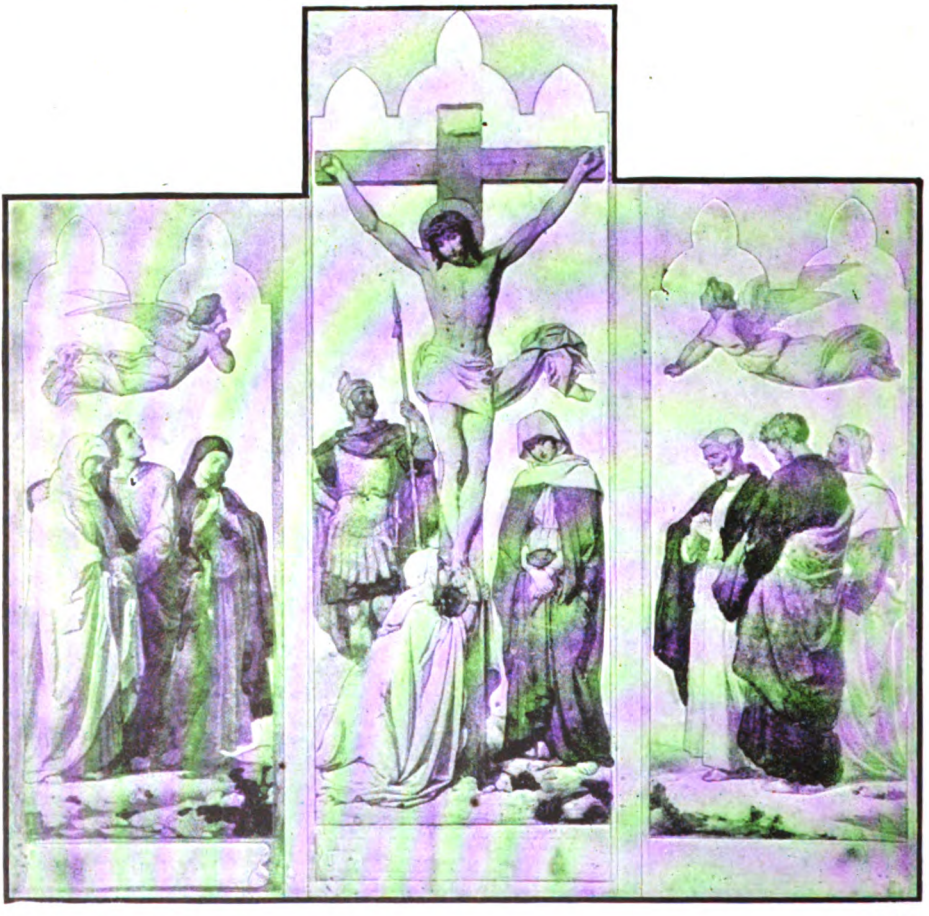
The artisan who sets the pieces of glass together does this on the outline tracing or working drawing, by first placing each piece in its proper position. He nails a straight edge along the edge of his work table, nearest him, along which he places a strand of border lead, pressing the glass into the groove of the same and keeping the glass temporarily in place with wire nails tacked into the table. These he draws out when placing the inside lead, and tacks them alongside the next piece of glass, and so on to the finish.

When the entire panel is thus leaded together, the joints are soldered first on one side; then the panel is turned, and the other side is treated in the same way. Next the cementers take the light in charge, and rub in the cement (thin putty) with brushes, and clean it off with sawdust, which is also manipulated with brushes, but these are of somewhat stiffer bristles.

The cement fills up all spaces between the lead and glass, binding the two firmly together and making it weatherproof. Strengthening or saddle bars are placed horizontally, so that the lights will withstand any windstorm.

The leading of all styles of art glass is done in the same manner.

Most of the illustrations in this article are from photographs of windows made by the California Art Glass Works of this city, while the remainder are from cartoons and colored sketches of lights and windows also made by this firm, but of which no photographs were taken.



The Crucifixion (from a Cartoon) C-251

Painting the Interior of a New House

Care to be Taken by the Carpenter so as Not to Mar the Woodwork—Most Durable and Appropriate Finish for the Several Kinds of Woods Commonly Used

MUCH of the success of the painter in producing a high grade or even a passable job of interior finish depends upon the condition in which the work is delivered to him by the carpenter. In the rush and hurry of modern building it is by no means uncommon for floors to be laid before plastering and for interior trim to be put up before the plaster has thoroughly dried out, and in some cases before the last coat of plaster has been put up. An excuse given for this latter practice is that this avoids patching the plaster on the last coat in order to remedy breaks and bruises caused by the carelessness of the woodworkers in putting up the standing finish. As every builder knows, it is almost impossible to patch plaster so that in certain lights the patch will not stand out prominently, and this is especially true of sand finish plaster.

With that carelessness of the work of other mechanics that the workmen in each separate branch of the building trades seem to acquire, the carpenter cares little for the finished work of the plasterers, and the plumber still less for the work of either plasterer or carpenter. Each seems to go on the principle that the painter is coming after them, and it is his business to cover up all their defects. But, unfortunately, by their carelessness they create conditions which the painter is unable to remedy—even though he does the best he can, and sooner or later the finish shows up poorly because of the poor work of the other mechanics. The owner fails to recognize this fact, and remembering that so and so did the painting blames him for stains on the woodwork or cracking or peeling varnish, even though the cause for these conditions is due to someone else.

If inside door frames are set before the plastering is finished or if the trim is put up before the final coat of plaster, the wet mortar will cause stains in the wood that is almost impossible to remove or obliterate by subsequent treatment. But if conditions are such that it is absolutely necessary to do this, then the woodwork should first be given a glue or varnish size, or it should be primed if it is to be finished in paint or enamel, or it should be filled with paste or liquid filler if it is to have a varnish finish. If the woodwork is of white pine or other soft wood, which it is intended to stain, either a coat of oil stain should be given, or if water or spirit stain is to be used this should be applied and protected with a coat of shellac. A strip should be nailed to the face of the frames to prevent them from scarring or defacement, and it would be well, if possible, to cover all the finished woodwork with building paper before the final coat of plastering is given.

So much moisture is contained in even apparently dry plaster, and is soaked up by the kiln dried lumber used in finishing, that it would be well if a heavy coat of rough paint were applied to the back of all standing trim before it is put in place. A coat of oil or shellac would answer where the wood is to be finished natural and it is desired to avoid any possible chance of staining the edge of the finish. This back painting prevents the moisture from the wet plaster being absorbed by the wood.

Residence of Mr. A. C. Bird, Compton, Cal.
A. F. Rosenheim, Architect

C-252

Residence of Mr. A. M. Chaffe, Los Angeles
Hunt & Eager, Architects

C-253

If the finished floor is laid before plastering, after it has been planed and sandpapered, the cracks should be filled with putty composed of two-thirds whiting and one-third white lead mixed with pure linseed oil; or, better still, with one of the prepared crack and crevice fillers that are to be found on the market, and which are not so likely to be affected by the shrinkage of the wood as putty. If the floor is of hardwood, it should now receive a coat of paste filler well rubbed in, followed by a thin coat of shellac. If the floors are of soft wood they should receive a thin coat of shellac or a coat of oil stain followed by a thin coat of shellac. When this has become perfectly dry, the floors should be covered with heavy building paper or carpet lining, tacked down well, to prevent injury or marring. This covering should remain on the floor till all the other painting and wood finishing in the room is completed, when the floor covering is to be removed and the floor is to be finished last. It is far better, however, and amply repays the additional cost, if a rough floor is laid before plastering, and if the finished floor is not put down until after the plastering is completed.

Very many carpenters are far from careful in putting up standing finish and allow the mouldings to become dented or marred by careless use of the hammer or by allowing the finished woodwork to be struck by boards and the like. These dents and bruises, though barely perceptible on the unfinished wood, show much more plainly when the work has been painted or varnished, especially where a gloss finish is employed. Moreover it is almost impossible for the painter to completely remove them. More care on the part of the carpenters to avoid marring the finished woodwork in the first place would make it possible for the painter to do better work and to give better satisfaction to the owner.

Before turning the work over to the painter to finish the carpenter should sweep out the room, removing all blocks, shavings and the like, and should turn over as much of the building at a time as possible. It is unreasonable to expect a painter to make even a half-way decent job of interior painting or varnishing if he is compelled to work in a room where other mechanics are at work and where the air is full of dust. The soft and tacky surface of partly dry paint or varnish catches and holds the flying dust, making a rough surface that cannot be made smooth by subsequent sand-papering or polishing.

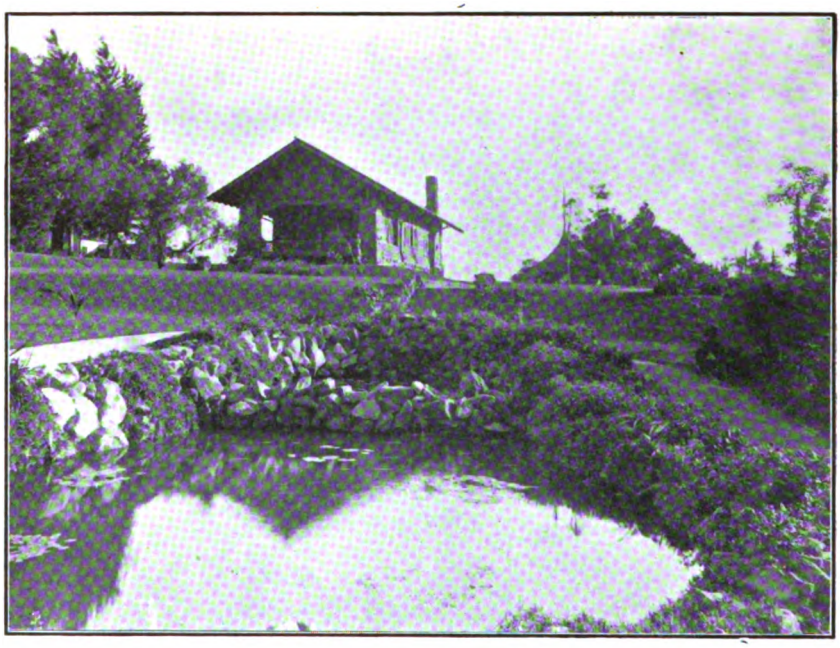
After the carpenter has finished cleaning up the woodwork and has delivered it to the painter, it is still far from being ready for finishing. The carpenter's idea of cleanliness and smoothness is very different from that of the painter. To do a good job, the painter must go over the work with fine sandpaper or steel wool, removing all pencil marks and dirt from the woodwork and making it as smooth as possible. He should then sweep the room clean and thoroughly and carefully dust the standing trim, and when this is finished the work is ready for painting or varnishing. We are assuming, of course, that the trim has been put up after the plastering and that no preliminary priming has been done.

From the very start, more care is required with interior painting than with exterior. No greater mistake can be made than that of using second-grade or combination leads or ochre for priming. No pigment should be used, but the finest ground and perfectly pure white lead. In case the wood is discolored the priming coat may be tinted with pure lamp black to a very light lead color, the succeeding coats being white, if that is to be the color of the finish, or tinted as may be required.

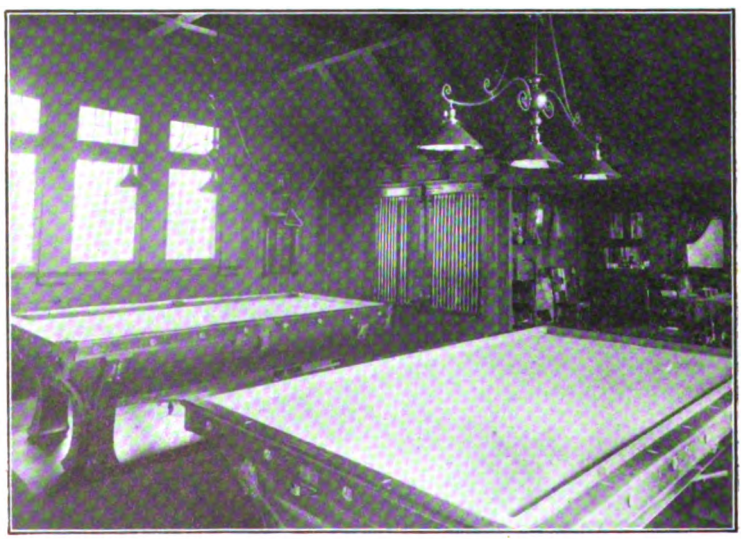
Before priming, all knots and sappy places in the wood must be coated with pure grain alcohol shellac. Wood alcohol shellac or the cheap shellac varnishes that are largely adulterated with rosin will almost aways cause peel-

Splendid Hallway of Mr. John D. Spreckels' Residence, San Francisco. *Reed Bros., Architects*

Drawing Room in Residence of Mr. John D. Spreckels, San Francisco Reid Bros., Architects



Mr. Eben Smith's Private Billiard Hall, Los Angeles *Hudson & Munsell, Architects* C-256



Interior of Mr. Eben Smith's Private Billiard Hall, Los Angeles
Hudson & Munsell, Architects C-257

ing or yellow spots, and will give no end of trouble. For a first-class job of interior painting the entire woodwork should be given a light coat of shellac. This not only serves to prevent the knots and sappy places from staining the paint, but it acts as a surfacer, filling the soft, open-pored parts of the wood, so that when the paint is applied it will dry alike over its entire surface. Where cost is an object a coat of good liquid filler is recommended, instead of shellac, by many painters as a suction stopper. But cheap liquid fillers made of rosin varnish doped with a chemical to give them the appearance of being made with a pigment base should be avoided, as they will be sure to cause trouble. In buying liquid fillers it is well to remember that it is impossible to get a good article unless one is willing to pay a fair price. Copal varnish or hard oil finish, thinned with turpentine, is also used as a size before painting. Where low cost is an object, and it is desired to produce a finish that will wear reasonably well with the fewest number of paint coats, a coat of hot glue size is sometimes given. It must be applied hot and very thin, for if allowed to get cool it will not penetrate into the pores of the wood, but will lie upon the surface, and is liable to break away, causing the paint to check or crack off. But if properly applied and covered with paint or varnish, it will be difficult for ordinary dampness to affect it.

We are now ready for the paint, and although many specifications continue to call for "pure white lead and linseed oil to tints as directed," the intelligent, practical painter knows very well that if this direction were literally followed the result would be very unsatisfactory, because linseed oil turns yellow when it is not exposed to strong light, and no matter what the pigment may be or what color may be used for tinting, there will be a perceptible change of color tone in all those parts of the room that are not exposed to direct sunlight. This is very easily proved by taking a piece of board and painting it with any white paint—be it pure white lead, pure zinc white or a combination—mixed with pure linseed oil, and after the board has thoroughly dried in the sun, wrapping half of it in black paper or cloth. The board should then be put where it will get direct sunlight every day and kept there for three or four weeks. Unwrap the covering from the board and the unexposed part will be found quite yellow in tone, while the exposed part will be clear white. If the board had been painted a light blue tint this yellowing of the oil will change it to a pale green. A day or two in the sun will bleach the board back to its original whiteness. Therefore, in interior painting the linseed oil must be more or less replaced by turpentine, the proportions varying with the different coats.

If no shellac or other sizing has been used before priming, the first coat should consist of five or six gallons of linseed oil to two gallons of turpentine as a thinner for one hundred pounds of pure white lead. A large portion of the thinners will sink into the wood, leaving the paint film with very little gloss, or nearly "flat." If an increased amount of turpentine is used, the amount of linseed oil should be decreased. Where the work is to be finished in oil—that is, with a gloss—more oil can be used in the priming than when it is to be finished flat. It must be borne in mind that for interior painting the priming coat should be so proportioned as to dry hard and firm, in order to insure the best results at first and the most satisfactory job when repainting becomes necessary. As interior paint does not have to resist the weather and extremes of temperature, the same degree of elasticity is not required as for exterior painting.

Where a preliminary sizing coat has been given, fairly satisfactory painting can be done with two coats, though three coats make a better job. One more coat of paint in each case is necessary where painting was begun on the

bare wood. The first coat over the primer is usually mixed with about equal proportions of oil and turpentine, and some painters add about half a pint of hard drying or enamel varnish to the gallon of thinners. This means a pure copal varnish—neither rosin varnish nor damar varnish should be used.

After this coat has dried hard all nail holes, cracks or other imperfections should be puttied with pure linseed oil and whiting putty or with a putty composed of equal parts whiting and white lead. Some painters, however, putty before priming, going over the work after priming to fill up any places that have been omitted. The work should then be thoroughly sandpapered or smoothed with steel wool and carefully dusted off.

When only one more coat is to be given the thinners may be mixed either in the proportion of four gallons of linseed oil to one quart of turpentine for gloss work; one-half gallon of oil to two and a half gallons of turpentine for flat finish or one gallon of oil to two gallons of turpentine for egg shell gloss. This is for the ordinary run of work. Where a dead flat finish is desired, the lead should first be washed in turpentine to get rid of the oil and then thinned with turpentine. The best result can be obtained by using pure French zinc ground in bleached linseed oil—or preferably in damar varnish—and thinned with pure turpentine for the last coat. For applying the last coat, where a smooth, even finish is desired, only chiseled pointed varnish brushes should be used on the final coats, while the priming coat should be thoroughly rubbed out with 6-0 round or "pound" brushes. The above directions apply to the last coat, for if more coats are used the primer should be mixed as already directed, and the second coat should dry with an egg shell gloss. Sandpapering is needed after every coat.

Some painters advocate mixing the last coat for a gloss finish with one-third oil, one-third turpentine and one-third good copal varnish. Such a finish will dry hard and can be scrubbed, but it will turn yellow with age.

For a gloss white finish on bare wood, the priming coat should be mixed thin, with one-eighth hard drying varnish to seven-eighths turpentine—the pigment being pure white lead. For the second coat use zinc in damar reduced to working consistency with turpentine, and for third coat use one-third of the second coat mixture and two-thirds enamel varnish. This finish, however, must not be confounded with enamel finish, to which it is much inferior.

Where tints are to be used, the process employed does not differ in any essential from that already described, except that the white lead or zinc white are to be tinted as required with pure tinting colors.

In the foregoing no attempt has been made to give any proportion for the driers that it will be necessary to add to the paint, as this will vary with the temperature and humidity as well as with the brand of driers used. A pure turpentine japan drier should in every case be employed to get satisfactory results.—E. H. Brown, in the American Carpenter and Builder.

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The Grand Jury for Cook County, Ill., has just returned an indictment against one Frank Koenig, a contractor, who is charged with practising as an architect without a license, in disregard of the Illinois architects' license law. If we are right in thinking that this is the first suit of the kind, we hope that Mr. Koenig has money or backing enough to fight the case through the courts. We believe the constitutionality of this law has never been passed upon, and the fact that courts in other States have declared similar license laws as affecting other trades unconstitutional, makes it desirable that the constitutionality of license laws as applied to architects should be passed on.—Architect and Building News.

Paints and Painting

By W. J. PIATT

AFTER a good many years spent in the making, selling and using of paints for out door wear on the Pacific Coast it has been my experience that the average painter uses entirely too much zinc in his outside paints. If a lead is thoroughly and finely ground to such a form as to accept the same amount of oil in the thinning out that the lead and zinc combination paint would take I believe it to be a better paint than if it contains the percentage of zinc usually used by the painter on his work. He either puts this zinc in himself or he allows the manufacturer to put it in and while zinc has an influence on the wearing of paint as it stops the oxidizing of the lead in a measure an excess quantity of zinc, say anything above 20%, in the Pacific Coast climate will cause that paint many times after a few years' wear to crack and wherever the cracks come the edges are bound to curl. This ultimately causes the surface to be burned off or if other coats are put on it simply makes a bad matter worse.

Many painters believe in putting in equal parts of lead and zinc in making their house paints simply because they are told that it makes it more durable and this has been drummed into them to such an extent and it takes so long to determine the real facts of the case by years of wear that they have not yet found out that the result is injurious in the long run. Whereas if they put on a good straight lead (and if they must put some zinc in it let it be not more than from 10% to 20%) it will last just as long and look quite as well, in fact better, and the next coat may be put on top of this years afterward in perfect safety.

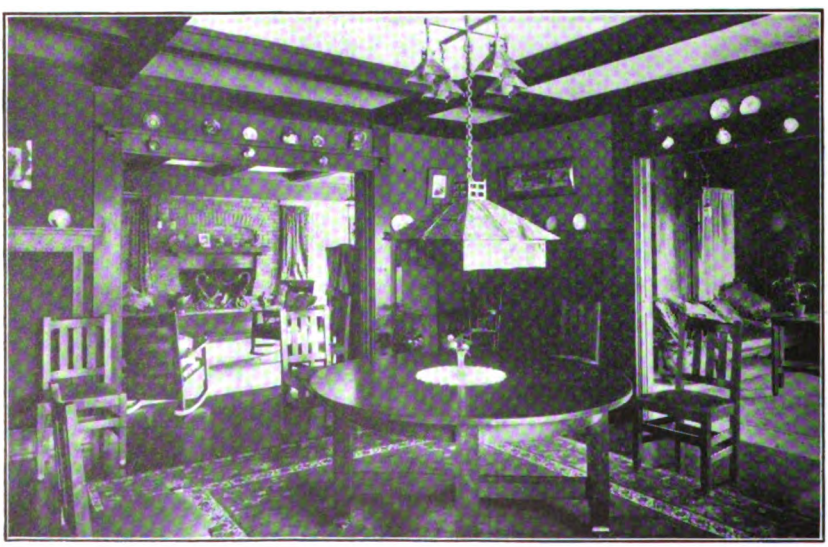
I know of a case where a friend of the owner of a paint factory went to him to buy his paints and it was in the early day of the zinc lead combinations and the paint he sold him was composed of about 40% of zinc and 60% lead. The house to be painted was a very large wood structure located on a prominent corner and the owner of the building asked the paint man to give him the very best goods he had without regard to price, and I believe this was done. This paint was put on over some old coats of dry paint that had been on the house for quite a number of years and it had no elasticity left in it and when the other paint was applied it looked fine and the owner was thoroughly pleased with the result.

I went by the house about four years afterwards and was astonished to see the paint curling up in great big flakes all over the building, and knowing who had painted the job I went to him and asked him if he put the material on as the owner of the paint factory had directed and he stated that he had and that he had been paid by the day for himself and his men and he had no object whatever in doing anything else than as the owner desired. He spoke of the flaking up of this paint and said that it was the last time that he would ever put on a combination which carried such an excess of zinc.

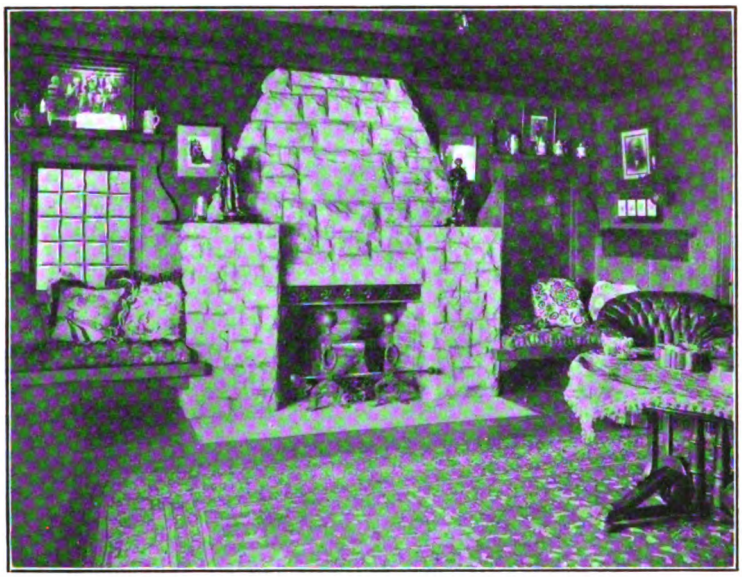
No doubt every painter or paint contractor and a great many architects have suffered from the excess amount of zinc used in paint and probably used in good faith by the painter, but the fact remains just the same that if you use a good lead and straight Linseed oil the world will wag on just about like it did before zinc was ever heard from and you can paint your house over and over again without that danger of having to burn it off through somebody putting in a larger percentage of zinc than should be used.

There are a number of good leads being turned out on the Pacific Coast by Pacific Coast manufacturers and these leads used as they should be will certainly make permanent and durable work.

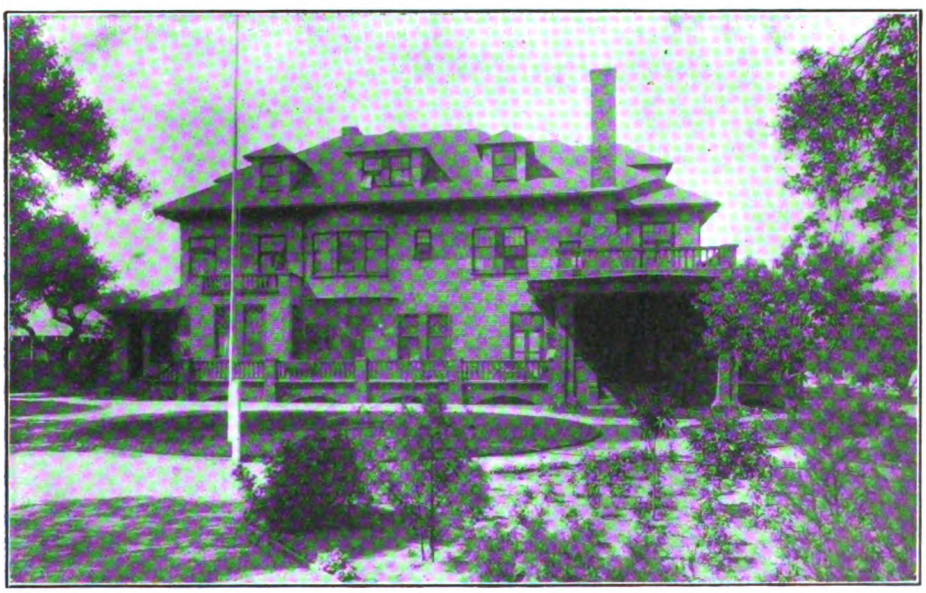
Residence of Colonel Stearns, Los Angeles *John Parkinson, Architect* C-258



Dining Room in Residence of Mr. A. M. Chaffe, Los Angeles *Hunt & Eager, Architects* C-259



Interior of Mr. Eben Smith's Private Billiard Hall, Los Angeles
Hudson & Munsell, Architects C–260



Residence of Mr. Alexander Baum *Herman Barth, Architect* C–261

Design for a Hall Grill *Inlaid Floor Company* C-262

The architect, I believe, spends more sleepless nights and has more worry over the painting contracts let on his buildings than he does over any other part of the work of erecting a building and he generally gives it less attention. Many times he gives out an impossible specification, one that a good man knows that it would be impossible to carry it out and obtain a satisfactory job, and the cheap workmen will figure on giving him the worst of it any way so it does not matter much to him what the specifications call for. He expects to do a lot of the work when the architect is not there and all he wants at the end is to get his money to the amount of his bid when the building is done. The owner jumps the architect and the architect comes back on the painter, but he has drawn enough on the job to make him safe on what he has done and the architect is forced to smooth matters over and get out of it the best he can.

This has been repeated so many times that the architect has become disgusted with the paint business generally and tries to avoid supervision of the painting part of it if he can.

I have read over many specifications from architects which would make any painter smile. For instance, on interior finish of natural woods on some houses I have seen the specifications call for two coats of shellac, one coat of filler and four coats of varnish. Well, the painter looks this over and he says to himself one coat of filler and two coats of varnish will just about do this job and on the dark places which do not show out very strongly when it comes to inspection he only figures on giving one coat of filler and one coat of varnish and when the job is nearing completion the owner wishes either to get into it or rent it to somebody and begin to realize some return on his investment. He hurries the architect and the architect hurries the painter who is always the last man to finish his work on the house and they pass over many things that in their desire to obtain possession of the property they would not otherwise accept and some painters no doubt take advantage of this, but if the architect would make his specifications as carefully for the painting part of it as he does for the other part and would see that they were followed out in the same careful manner and would give the painter a reasonable time in which to do his work it is my belief that he would in nine cases out of ten get the kind of work he desires. Unfortunately the painter invariably gets in at the last when everybody else is supposed to be through with their work and it is usually a case of rush and scramble to get through regardless of consequences.

Many a house on which all the rest of the work is fine and carefully carried out is ruined on the inside by the painter having to hurry, hurry, hurry, and he puts on one coat over another before the other coat is dry and hard. The architect is between the owner and the painter and he gets it from both sides. The remedy certainly does not lie with the painter and if the owner or architect wants to get good work done he must give the painter a reasonable time and that is determined by the style of finish used.

Another thing in line with the painting and the hurrying up of the job at the finish is the tinting on the plastered walls. Many times a contractor has so many days stipulated in which he has to finish the house from the foundation to the time he turns the keys over to the owner. Perhaps the weather holds him back on some part of the work and he has a forfeit stipulated if he does not finish the work by the time given. With this forfeit staring him in the face he perhaps gets the building done all but the painting and the time is very close for him to turn it over. He rushes the painting. His plastered walls are full of fresh lime which will act on any tint which goes upon these walls and still he must tint them a certain color in each room

as the specifications or owner demands and here is where he meets with trouble. He puts on a color as a tint and in a couple of days he goes back and finds the wall all burnt out with lime spots. He looks at it and swears it is not his fault because if he had had his way about it he would have waited until the wall dried out. The owner looks at it and swears the painter does not know his business or else he used poor material and he will never give him another job. The painter to protect himself falls back on the man who furnished the material and swears he paid for good goods but got poor ones so it harks back to the man who furnished the goods whether guilty or not.

Now I don't want to blow my own horn too loudly, but after a great deal of experimenting we have finally obtained four shades, blue, green, red and yellow which when put on a half dry wall will stand against even new lime and not become discolored by it. They are comparatively new in the market, but wherever they have been tried thus far they have proven to be a success. We call them the Arno fast colors. They are inexpensive, and I believe will save many times their cost to the man who desires to avoid trouble on buildings where the lime is not thoroughly dry.

Substitute for White Lead

British trade journals describe a new white paint, patented in Germany, which is claimed to far excel white lead and other similar products in fineness and smoothness of surface, covering power, permanence and cheapness. It is said to be obtained by saturating burnt lime containing magnesia with a hydro-carbon, and firing until all the carbon is burned. The material is then ground fine and colored ready for treatment with linseed or other saponifiable oils; with mineral oil, also, partial saponification takes place, resulting in a good workable paint. A dolomitic limestone, containing from 20 to 50 per cent of magnesia is said to be best for the purpose, although a limestone having less than 20 per cent may be enriched by adding the desired quantity of magnesia, but not with such good results as are produced by the dolomite. Other pigments can be mixed with the material to produce paints of any required shades. The advantages claimed for the paint are that it dries quickly without driers, is unaffected by light, and not changed by ammonia, sulphureted hydrogen or sulphurous acid; that the coating hardens like enamel after some months, possesses a dull gloss, does not blister in the sun and is washable, yet retains its original smoothness.

It isn't always the naughty plans that come to naught.

Nothing grows like a grievance, with proper nursing.

Beware of effusiveness. The hand shaker may also be a leg-puller.

A watched pot never boils, but a workman frequently does.

There's no trouble about the man at the bench finding the best side of the file.

When things begin to look prosperous around the office you may look for a cut-down.

Cement and Concrete

Concrete Construction

By CHARLES F. WHITTLESEY, Architect.

REINFORCED concete, though popularly supposed to be a new method of construction, has not been developed in a single decade, nor is it the invention of one man, but was in fact used in its simplest form more than 2,000 years ago by the Romans, who used short iron anchors to tie the stone facing blocks on the outside of a wall to the facing on the inside, through the concrete filling of the wall. Its present development, however, began in the middle of the last century.

The discovery in recent years that concrete and steel expand and contract at practically the same rate in extreme temperatures, has been the chief reason for its popular adoption in Architecture. This fact is of fundamental importance, for no other system of fireproof construction, such as steel combined with clay tile, has this advantage. A building constructed of reinforced concrete will withstand a temperature of 2,500° Fahr. for hours without serious damage, for the following reasons:

First: As stated above, the expansion and contraction of steel are practically identical and therefore the adhesion between the two materials is not destroyed and the latent forces of the structural members are not set up in opposition to their working forces, or, in other words, the steel and concrete are not subjected to additional stress.

Second: A temperature of 1,000 or 1,500° Fahr. dehydrates the surface of the concrete to a slight depth which makes of this outer surface a splendid non-conductor through which great heat would require to be forced for many hours to continue the dehydrating process, especially as the heat is absorbed by the large and solid body of concrete back of the surface.

Clay products expand under high temperature changes more than twice as much as steel, and therefore partitions and floor arches of hollow tile in a conflagration expand more than the steel frame and tie rods will admit of, and consequently must buckle and burst their bounds. One side of a hollow tile floor or partition block becoming heated, while the other side is comparatively cool (for these tile are excellent non-conductors) will expand and burst off; the same is true of the beam and column coverings.

Is concrete a safe building material for superstructures?

Is there more risk attendant on this construction than on others?

Residence of Mr. H. C. Beville, Hollywood *Hunt & Eager, Architects* C-263

Another Karl Nickel Bungalow, Oakland C-264

These are the burning questions of the hour! They are grave ones and should not be answered lightly. No class of construction is fool proof and therefore rigid building laws, intelligent designing and competent supervision are assumed to be necessary for all kinds of construction for buildings of any consequence. Last year several high brick walls collapsed in New York City through carelessness in building. The same kind of accident has occurred in Chicago numerous times, and in other places. Brick architecture has been used since before the earliest records of the Egyptians. Each one of you would build a brick wall to any reasonable height without fear of consequences, because you feel that you know how it should be done and feel that you are capable of supervising it to a successful result. The fact that brick walls have collapsed would not influence you to condemn the use of brick as bad construction.

Many failures of steel structures have occurred in recent years in bridges and buildings; some of them with very grave fatalities. Some have been due to faulty designing, others to bad assembling. These are never offered in evidence as a reason for abandoning steel as a structural material.

When steel for structural purposes first came into general use there were many who earnestly and honestly contended that it was not fit for the purpose because of inherent faults, such as corrosion and crystalization. These questions have not yet been satisfactorily settled and some of the most eminent engineers in the world, today, predict dire calamities for our high steel structures at no distant date. In reinforced concrete construction the steel is entirely surrounded by the best known material for its protection from corrosion and the concrete bodies are so large in proportion to the steel members that all vibration (the cause of crystalization) is absorbed by the concrete, which being crystaline in its nature is not affected. For this reason reinforced concrete has given eminent satisfaction in factory construction.

The ordinary lug and bracket construction for assembling members, in use in most of our steel buildings, would not in many cases bear the scrutiny of an expert and in an actual test in comparison with the connections in a modern reinforced concrete building, would prove feeble and flimsy.

We often hear the question, "Suppose you get a bad sack of cement into some vital part of the work. Would it not be fatal?" This seems to be the popular idea of the danger that besets reinforced concrete construction. To those who are familiar with the methods of manufacture and testing in a modern, first-class Portland cement factory, such a proposition is almost inconceivable. But granting that the tests at the factory and those made on the work are neglected and that a sack of really worthless cement has got into the mixer! The probability is that it will become so assimilated and diffused through the work that our factor of safety would cover the deficiency. The most important element of danger is the disturbance of the concrete mixture after the initial set has taken place, through lack of rigidity in the form supports, causing vibration, or from wheeling barrows over the ends of the rods imbedded in the fresh concrete. This is a point on which workmen are most likely to be careless, and one which needs constant watching. In fact, the really essential things which the construction gang should know are overlooked by careless workmen, because they are so extremely simple.

After choosing a well-tried brand of cement for your work and making a few careful tests for initial sets, constancy and tensile strength, this part of the work becomes of secondary importance and the superintendent's time should be devoted to close scrutiny of the manipulation of the material. Watching the mixing is of course important, especially if the contractor or his men are inclined to shave the cement measurement. There is often an

inclination to use too little crushed rock and make up the deficiency with sand, which costs less and to the laborer seems just as good and easier to work. An excess of sand is as injurious to good concrete as too little cement.

For ideal construction all beams and floor slabs on one level should be filled at one operation, to avoid joints between the floor slabs and beams. It is more convenient, however, to fill the beams first, and after they have became hard to lay the floor slab. This is permissible when stirrup irons or U bars are used at frequent intervals in the beams, with the ends standing high enough to come well into the floor slab.

Filling the beams first is usually performed by starting with those nearest the mixer to avoid getting dirt into the beam boxes, by constantly wheeling over them, for when the steel has been placed in the boxes it is difficult to clear the bottom of dirt which may drop into them. This method also permits the steel gang to work ahead of the concrete gang without interfering with each other.

It also admits of the floor steel being left out until the beams are all in place. The forms should be rigid and well braced for this method of working, to prevent excessive vibration in the concrete, after it is in place and partly set, by wheeling the concrete barrows over it.

There is a general tendency among concrete constructors to use forms built of material too thin and put together in a flimsy manner. Good stiff forms not only make better work, but are not more expensive, because they require less bracing to make them rigid.

The casual observer of buildings under construction would probably conclude that steel buildings can be erected more rapidly than concrete structures. This is true only in the actual erection of the frame, for taken from the moment when the architect receives orders to proceed with the work, when only preliminary sketches have been made for the steel construction, working drawings and framing plans must first be prepared and the shop work on the steel produced before superstructure on the building site actually begins. Then the frame goes up rapidly, and the public is impressed with its rapid climb skyward, not taking into account the fact that the fireproofing must all be placed before it is in fair comparison with reinforced concrete. Tile floor arches, by the way, require forms as well as concrete. On the other hand, as soon as the sketch plans have been decided upon the steel for reinforced concrete work can be ordered, and at the present time can be delivered in Los Angeles from the Pittsburg mills in thirty days from receipt of order, and goes directly to the building from the rolling mill, without requiring any shop work, and as the structure rises it is ready for plastering.

The relative merits of the various systems of reinforcing construction and the comparative advantages and disadvantages of mild, medium and high carbon steel would require many pages to develop and may be had by those who are desirous of pushing their investigation of the subject in the works of Marsh, Buel & Hill, Taylor & Thompson, Considere, Christoph and other writers on the subject. A few general remarks here will, therefore, be given only as a synopsis of the subject.

High carbon steel should be used only by those who have the knowledge and discretion to apply it judiciously. Its economy is not so great as might be supposed, judging by the difference in ultimate strength compared with mild steel. The base price of high carbon of steel is not much greater than mild or medium steel, but the price advances as the sizes reduce, and in ordinary working values for high carbon steel will give such small sizes that the net price would be nearly as much as the cost of medium steel to do the same

work. Medium steel gives good values for working strength, and is not too brittle for bending and twisting, and is not liable to break under a severe shock.

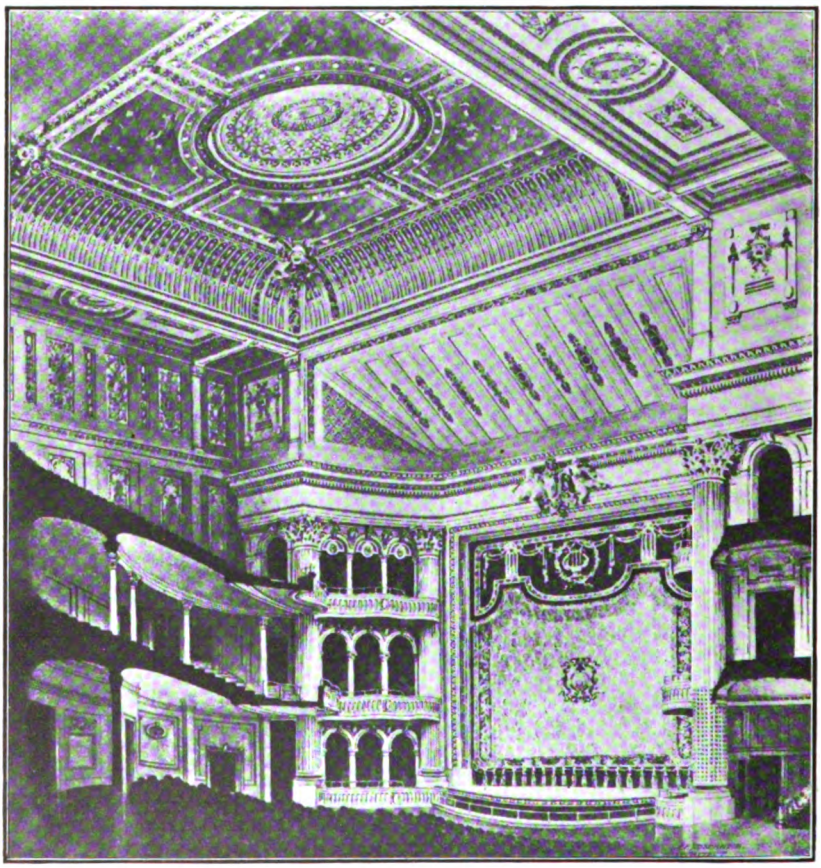
While the majority of the work in Europe has been built with plain round steel, and with satisfactory results, there are reasons why a twisted square bar is better for certain purposes. Twisting the steel unquestionably increases its working strength, furnishes a continuous mechanical bond and the twisting process throws off the scale from the surface, which should allow more perfect adhesion of the cement to the steel. Many patented bars are on the market, several of which are good, but none of them offer any advantage over the twisted bar, on which there is no royalty.

Generally speaking, a number of small rods are better in a girder than a few large ones, and plenty of stirrups of small section are very desirable, not only to provide for shear at the end of the beam, but to tie it securely to the floor slab, forming an effective T beam.

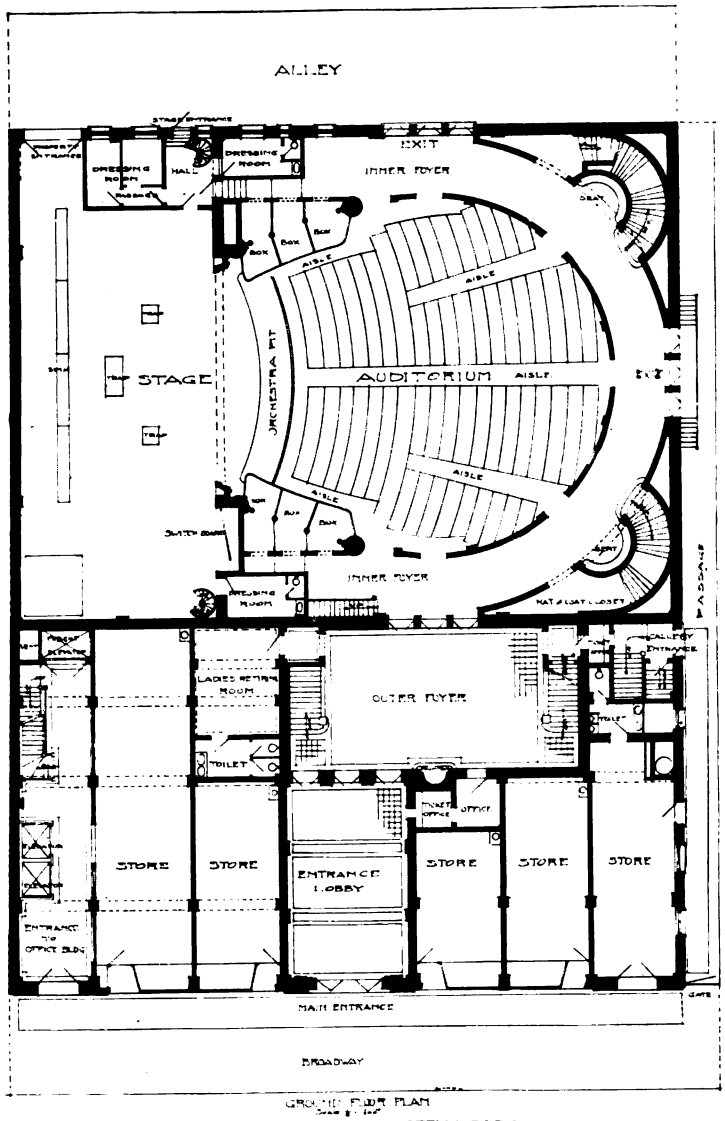
Carrying a given load in tension with steel costs about one-sixth as much as it would to do the same work with concrete, but to carry it in compression would cost about twice as much to do it with steel as it would to do it with concrete. The net result applied to practical building operations has demonstrated in all parts of the world a lower cost for the reinforced concrete construction compared with any other method of fireproof building. In the New England states it has been demonstrated many times that for factory construction, reinforced concrete costs not to exceed 7 per cent more than slow-burning mill construction, and under favorable conditions the cost is about the same. In Los Angeles it is too early to make accurate comparisons for general work, but it is safe to say that in fair comparison to other kinds of work, reinforced concrete will lead in point of economy in cost, as well as in durability and general utility.

Los Angeles is favorably situated for the advantage of this kind of construction; our rock and sand are above the average, and are not expensive. This market supplies several brands of excellent domestic Portland cement from competitive points, with the competition of the importers and excellent prospects for its manufacture close at home. The price of Portland cement in this market will not be to exceed one dollar ($1) a barrel in less than five years, which will make concrete construction universal even for cottage construction. Beach sand, though unfit for plastering, is suitable for concrete work, and will eventually be brought to the city for 30 or 40 cents per yard. Skilled labor in all branches will advance in cost. Common labor will become cheaper as population becomes denser, as it has in all older countries.

Concrete construction employs a greater proportion of common labor than any other system. It seems, therefore, that the future will show that reinforced concrete will be the universal building material for all manner of uses. There is not a State in the Union which has not large deposits of suitable material for the making of Portland cement. Cement factories are being built in the United States at the rate of one to three per month, involving capital for each to the extent of at least $150,000. Promoters say that there is no kind of enterprise so easy to float as a cement factory. The profits are large and the demand exceeds the supply. The cost per barrel at the Iola, Kansas, factory, including all expenses, is about 35 cents. Can there be any question, therefore, of our entering rapidly an age of concrete construction?



Interior of New Majestic Theater, Los Angeles *A. F. Rosenheim, Architect* C-265



GROUND FLOOR PLAN

MAJESTIC THEATRE and OFFICE BLDG

AFROSEMEIM ARCHITECT LOS ANGELES CAL

C-266

The Inclined Elevator

The latest application of the inclined elevator, commonly known as the moving stairway, is found in a freight elevator for carrying trunks, mailbags and boxes between steamers and wharves. This elevator, which is practically a gangplank and can be shifted about, contains within itself the entire apparatus, including the electric motor.

Its floor, instead of being composed of planks, is a movable platform.

There are only four such elevators now in use in the world, and these are all at Dover, England. Steamshipmen are considering its use here.

Another use of the inclined elevator is in stores, from basement to sidewalk. On it men with hand trucks and with rolling boxes or baskets are carried, as well as merchandise.

Another novel use for the inclined elevator has been found in England at seaside resorts on its southern coast. Here in many places the beach runs from high bluffs, from which visitors must descend by stairs to reach the shore. At a number of these places elevators have been installed.—Architects and Builders' Journal.

* * *

New Method of Stairbuilding

The stair builder who, of all woodworkers, has one of the most difficult tasks, is threatened by the invention of a north side man who believes he has found a way of constructing stairways much more cheaply. The plan includes an inclined plane with grooves, in which are inserted triangular frames with level surface on which the foot is to rest. The foot rest is strong, but light and kept from slipping by the weight of the person. In the progress up or down stairs, the foot rest may be made to slide, and the size of the step may be anything from an inch to the extreme of leg-stretching. Experiments are now being made with the device, and great claims in the matter of convenience and comfort for the aged and infirm are made for it.—Ex.

* * *

His Trade Pin

A verdant youth who had just completed his apprenticeship as a carpenter, dropped into a jewelry store and, after looking at some fraternity pins, asked: "How much is this one with square and compasses on?" pointing to a Masonic pin. "Five dollars," said the dealer. "You haven't got one with a handsaw on, have you? I'm just out as a carpenter and jiner, and I'd like to have something to wear so people would know what I am doing. I'll take it, though I'd like to have one with a hand saw, but I guess this one's plain enough. The compass is to mark out our work, and the square is to measure it out, and every gol durn fool knows that G stands for gimlet."—Ex.

Reinforced Concrete Residence of Mr. Henry Gervais, under Construction C-267

A Reinforced Concrete Residence

A FINE example of reinforced concrete construction as applied to residences is shown in this number of the Architect and Engineer. The photograph was taken of the house in course of construction. A picture of the building, finished, or nearly so, will be shown next month. This residence is the property of Mr. Henry Gervais, a well-known artificial stone steps and mosaic manufacturer. It is situated near Burlingame and is a credit to the owner who is also its designer and builder. It is the pioneer building of its kind near San Francisco.

It is claimed by Mr. Gervais that the walls are only four inches thick and that the house is very cool in summer and very warm in winter, that no moisture whatever creeps through the walls and that plaster can be applied to rough walls without any furring. The outside walls can, if wanted, be plastered with cement plaster and given any kind of finish desired.

The floors and roof are also of reinforced slabs four inches thick and fifteen feet span reinforced with three eight round bars eight inches center to center in both directions. The beams are eight inches by twelve and reinforced with four three quarter inches round rods held together with one quarter inch stirrups.

The stairs are also built of reinforced concrete and above the middle landing to the second story they are suspended to the girder above. The house is entirely fireproof and its strength will increase with age. It is also very sanitary as no living animal or insect can lodge in the walls which are solid. All rooms are sound proof from one another as are the two stories. The rate of insurance on such a building is very low and the depreciation is nearly nil. This house was visited by a number of prominent architects during its construction and they pronounced it a complete success.

Accepted Design for California Hall, University of California *John Galen Howard, Architect* C-268

Reinforced Concrete

By GEORGE H. WYMAN, Architect

GREAT interest is now being taken in reinforced concrete construction by both architects and engineers.

This method of building has come almost like a thunder clap out of a clear sky, although by investigation it is found that different persons have been experimenting (and some quite successfully) for the past thirty-eight years.

A gardener by the name of Monier, living in Paris, France, seems to have been the first person to discover the value of embedding wire and steel rods and other metal shapes into concrete.

Germany also furnishes examples in the inventions and successes of the Hennebique system.

Structures of both the Monier and Hennebique systems may be seen in the United States.

E. L. Ransome and P. H. Jackson, of San Francisco, have each added much information along this line by their persistent endeavors, Mr. Ransome being the inventor and patentee of the twisted bar which is being used largely in work throughout the country.

Perhaps the greatest effort in the building line in the past twenty years has been to find a truly fire-proof material having the required strength for structural purposes and approaching in cost the combination of brick, steel and wood, which is so well known and so universally used.

It would appear that reinforced concrete comes nearer filling these requirements than any process yet discovered, and in consequence we see at the present time some four or five important buildings being constructed by this new method in our own city.

Disastrous fires in our cities have shown the need of this investigation, the Chicago fire led to many attempts to produce fireproof buildings, and as a result we have our wonderful, gigantic steel frame buildings, in which many devices, more or less successful, have been used to protect the steel from excessive heat.

There was much adverse criticism of the steel frame building at the time of and for some time after its inception, as there now is with regard to reinforced concrete.

Some years ago a circular letter was distributed condemning concrete as a fireproof material, stating that concrete subjected to intense heat and immediately cooled with water was left in a crumbling, disintegrated, useless condition, and it is said that some concrete taken from one of the buildings located in this city, after having been subjected to heat, crumbled without the application of water, but reports upon the condition of a large number of the latest fire-proofing devices and systems, after they had passed through the recent, terrible Baltimore fire, would contradict this damaging statement with reference to concrete, and would seem to establish it as one of the best fireproof materials.

There is quite a difference of opinion among those who have given much study and made careful tests, strictly of reinforced concrete, as to the mixture, size and shape of steel, and whether stirrups should be used in beams, and if so how best to place them to counteract shear and give the greatest strength to the beam.

Numerous tests have been made to determine the effect in compression, tension, shear and the adhesive qualities of the cement to the steel, but perhaps the most important tests have been those to determine the effect on the concrete in tension, when the beam was loaded to exceed the safe elastic limit of the steel, although some very good authorities maintain that the cement can withstand this severe strain and recover, and that its continued usefulness is not impaired. This surely cannot be so. The entire strain must be taken by the steel or the concrete must certainly be ruptured, although the cracks are invisible to the naked eye.

In one series of tests, beams which have been previously immersed in water, when under loads excessive to the steel, gave evidence of fine cracks on the tension side, by water coming to the surface, these cracks were marked, other places showing no signs of cracks were also marked, and when the loads were removed the concrete was carefully cut away from the beams, and in each case where the water had shown, the concrete fell apart, while the other parts remained solid and uninjured, should these cracks occur in all excessively loaded beams, and should they extend into the beam as far as the steel, they would allow the moisture in the atmosphere to enter, and in time the steel would become so much affected that the beam would lose its entire strength value.

Tests of columns made with the column in a horizontal position are not the best which could be obtained, as the weight of the column aids much in its bending tendency, before the end pressure is applied; more accurate tests could be made by placing the columns in a vertical position, as they are placed for permanent use in buildings.

The recent conclusions that concrete made with small stones, and mixed wet, is equally as good, if not better, as regards strength, than the former process of using large stone and mixing dry, aids much in the ease with which the concrete is put in place, and gives more assurance of a uniform solid, well filled in around the steel.

It would be unfortunate if, through insufficient knowledge on the part of architects, or through the ignorance of cheap labor, which will undoubtedly be employed, some deplorable accident should take place and condemn the entire process before its full merits are known.

It may be unwise to place pipes and fittings and other materials not a part of the regular reinforcement, promiscuously into columns and girders. This may cause serious disaster.

Care must also be taken not to infringe on patents in placing the steel, or in other ways, as much expense and annoyance would be caused owners of buildings by litigation.

The question of value of floor space taken up by reinforced concrete columns as an offset to the additional first cost of steel fire-proofed columns may well be considered, as the concrete column takes up more room than the steel column, with its fireproof cover.

In cases where changes are desired after the completion of a building difficulty will be experienced in cutting away the concrete and steel, and such cutting would in some cases impair the entire strength of the building.

The effect of earthquakes upon this class of construction is as yet problematic and may prove disastrous to structures as they are now being built, and may necessitate special provision being made to stiffen up all intersections of columns and girders to meet these severe conditions.

We are living in a great age of experiment, and by experiment we learn. Therefore it is well to offer encouragement to new processes, that it may be

determined whether or not they are better than those to which we have been accustomed.

But those who assume responsibility in the erection of buildings should be thoroughly posted before undertaking work of importance, and thus avoid serious damage and loss of life.

* * *

Will Not Supplant Stone or Brick

Terse Statements Regarding Reinforced Concrete Made by Octavius Morgan, Architect, at Meeting of Southern California Chapter, A. I. A.

IN this discussion tonight I have been placed on the negative side in the matter of reinforced concrete construction, yet in justice to myself I must state that I am not opposed to reinforced concrete; that I recognize it as another method of building construction that is coming into more general use in the United States, and which has been in use in Europe for a number of years, especially in heavy construction, such as bridges, warehouses, etc.

The last few years I have made quite a study of this construction, and I must say that I have concluded that reinforced concrete has come to stay; that the safe and proper construction of a building in reinforced concrete is entirely dependent upon competent designing, competent supervision and the use of the best materials and labor. Reinforced concrete will not supplant stone, brick or steel construction. It will be merely another alternative method of construction. It will have its place, and is more adapted to certain forms of construction than others.

I believe the conservative man will for some time yet stick to the skeleton steel frame for high building. As is usual with all new things in this country, there is a tendency to claim for it merits that do not exist, and to make claims that the material or method of construction does not actually possess. In incompetent hands reinforced concrete is a dangerous method of construction; perhaps more so than any other method of construction, and the temptation to experiment, to cheapen cost and lessen time of construction is greater than in any other; and in no other, perhaps, is the danger greater by doing this than in reinforced concrete.

The advocates of reinforced concrete, to push its use, make great claims as to saving in cost and saving in time, and to substantiate these claims they will sometimes be tempted to reach the danger line; for one of the greatest elements of safety in reinforced construction is that the concrete shall have sufficient time to efficiently do its work.

The designer and user of reinforced concrete construction must ever have in mind the absolute uniformity required in their cement, their sand and broken rock, and their steel, and the placing of the same, to get the results required. When we read reports of the tests that have been made with this form of construction, especially in columns, we cannot but note the lack of uniformity in results. This must come from lack of uniformity in the material and construction, and shows how hard it is to get this uniformity. With knowledge before us the factor of safety should always be large—never less than four and better six.

I have before me reports of a number of tests made at the Watertown Arsenal during the year 1904 by the War Department, and when I see the variations of from 100 to 300 per cent differences in the tests of what was supposed to be like mixtures and the like arrangements of materials, I must say that it is almost with fear that I take up this method of construction.

Another thing, as to the reinforcement to columns that the steel rods give, we find the same variations in results and a disappointment as to the reinforcement the steel has given to the concrete. I take one test of a plain column, composed one cement, two sand and four broken rock three and one-half months old, the ultimate crushing strength was 1,710 pounds to the square inch. A reinforced concrete column of the same dimensions and the same mixture, one, two and four, reinforced with four three-quarter square rods set in two inches from the surface, the ultimate crushing strength was 1,990 pounds; that is to say, the steel one had 280 pounds per square inch, or 14 per cent to the ultimate crushing strength of this pier. These tests were numbered 1583 and 1580, respectively.

Again, we find in test No. 1615 a plain concrete pier, mixed one, two and four, six months old, ultimately crushing strength 1750 pounds.

Test No. 1610, concrete one, two and four, reinforced with four three-quarter twisted rods, eight months old, 1820 pounds ultimate crushing load per inch.

Apparently when the mixture is one, two and four, we get the best results. These tests surely show us that we must not place too blind confidence in the result to be obtained in reinforced concrete columns. Where concrete of the above mixture is used we apparently do not get the increased strength from the reinforcement that one might anticipate; but where a poorer mixture of concrete is used the steel reinforcement is more apparent, as in the following two tests, 1607 and 1608, plain concrete piers, mixture one cement, three sand and six broken rock, the ultimate strength was 462 pounds to the square inch.

In test No. 1608, concrete piers with a mixture of one, three and six, reinforced with four three-quarter twisted steel rods, ultimate strength 1,370 pounds. Here we have an increase of 200 per cent. Steel shows to its best advantage in a mixture of this proportion.

In reinforced concrete perhaps the most astonishing results are obtained from reinforced concrete beams and girders, and perhaps the greatest saving is made in this form of reinforced concrete construction. You use the steel in tension and the concrete in compression, getting the best and most economical results from each strain for metal used.

Reinforced concrete, more than any other method of construction, depends for its success on the contractor and his employes, for in no form of construction could an incompetent contractor or a careless workman produce such dire effects. The cement, the sand, the rock must all be of the right quality, must all be of the right mixture, that is, as to proportion, must be properly mixed, must be put in place in the proper manner, must be properly tamped—a failure of any one of these several items means failure of the whole. And in the placing of the steel not only must it be of the right sizes, but it must be in the right position. And from the extra difficulties of supervision and the knowledge of the architect that he is neither omnipotent, omniscient nor omnipresent, the cautious man will be slow to take up this form of construction; though perhaps when he does he will be the safer man to employ.

The enthusiast in this form of construction, to show his faith in reinforced concrete, will not always be on the side of good construction and absolute safety.

In this great and pushing age, this age of great competition, we are all

reaching for new things, and the fact that a thing is a new thing is by many considered evidence that it is better than the old—as they say, "More up to date." And to do business the new man will take up and push a new thing, making claims that are oftentimes of the most extravagant nature both as to cost and to time.

As I said in the beginning of this talk, great claims are made for the great saving in cost and time. Now, in certain forms of concrete construction, such as the heavier buildings—warehouses, bridges, loft buildings and structures of a similar character—no doubt reinforced concrete effects its greatest saving; that is, the actual saving in the structural parts makes a great proportion of the whole; but where it is to be used in an office building or any other finely finished building, the proportionate saving to the whole is very small. While the saving in the cost of the structural parts and the reinforced concrete frame may be in the neighborhood of 40 per cent, yet, as to the cost of the whole building, the saving may not exceed from 5 to 10 per cent. While this saving is worthy of consideration, as it is the duty of every architect and engineer to use this money of his client to the best advantage possible, yet this very duty requires that he shall be cautious and not, for the sake of a small saving, injure the whole.

In this great hue and cry as to the advantage of reinforced concrete construction, the builder is apparently forgetting the advantages of the older forms of construction—brick, stone and steel. There is no question but what, for high building, the steel skeleton frame will still hold sway, unless more positive and regular results can be obtained from reinforced concrete. The advantage of steel frame is the uniformity of its material and the ease with which it can be inspected from the time the metal is dug from the mine to the time it is set in place, a finished product, in the building; and the results obtained from such tests are absolutely positive. And the defects in steel are more patent to the eye of both the expert and the layman than in the material used in concrete and the method of its application. Again, in brick or stone the tests can be made more readily and the defects, if any, are more visible to the eye.

Now we are talking of brick—the product of clay—it is well to consider the faithful service it has given to the world during the last five thousand years and more, and not run away with the idea that this genuine material will be quickly given a back seat.

When I look at the results of a number of tests made at the Watertown Arsenal in 1904, at the same time the tests were made with the plain and reinforced concrete piers, we cannot but feel that our past confidence in this honest material has been well placed. Note a few of the tests:—

Test 1636, a face wire-cut mud brick, laid up in neat cement, crushed with an ultimate load of 4021 pounds per square inch.

Test 1596, hard brick, made at West Cambridge, Mass., laid up in neat cement, crushed at an ultimate load of 4,700 pounds a square inch.

A pier constructed of the same brick, laid one part cement, three parts sand, crushed at 1,800 pounds per square inch.

A pier made of this same brick, one part lime and three parts sand, crushed at 994 pounds per square inch.

Now, you will notice that it was the mortar in which the brick were laid that made the difference in the crushing strength of the piers.

A hard brick pier laid in neat cement crushed at 1,969 pounds per square inch.

A pier laid in one part cement and three parts sand crushed at 1,800

pounds per square inch, and a pier laid one part lime, three parts sand, crushed at 735 pounds to the square inch.

Now, we have another test, and I give this to show that we have a great variation as to loads. We will take test 1623, light, hardbrick, laid in neat cement, 1,061 pounds per square inch. Test 1635, made one part cement and three parts sand, crushing load 1,224 pounds. Test 1598, one part lime and three parts sand, crushing load 465 pounds to the square inch. The age of this pier was only twenty-four days, and you all know that a lime mortar pier at this age does not begin to give the maximum strength. In the cement-mortar piers, that is, a pier laid up in cement mortar, you are getting very nearly the full strength of the cement. And I have no doubt the brick pier, when six months old, would carry nearly double the load here given.

From the tests here given of brick and concrete piers, you see there is but little difference in the results; although, of course, with the increased strength of the pier, the difference in favor of the reinforced concrete would be more apparent. The advantage of a brick wall over a reinforced concrete wall is that it has more mass and would have all the advantages that this term means in case of fire and for stability. A poorly constructed brick wall is much more safe than a poorly constructed concrete wall. It will stand alone, and the difference between it and a good wall is that one will stand more than the other, but a really poor concrete wall has no structural value whatever.

Concrete, plain and reinforced, is, perhaps, more valuable for retaining walls than any other material, and where it is possible I should use it for this purpose at all times. But as the walls of a building, I am strongly prejudiced in favor of brick; as I said before, for its mass and stability, and again, for its greater adaptability to meet the changes that are incidental to the life of a building.

Concrete and reinforced concrete, when used, must be considered as a permanent construction. It is not well adapted to meet changes that are incidental to the life of a building. It being a plastic material, it has all the characteristics of plastic construction. Once done, it is done for all time.

In this discussion perhaps it is not of much importance to make any comparison as to the value of old material, but when we consider the salvage from a concrete building when it is torn down, and the salvage from a brick building, and the salvage from a steel building; in the concrete building instance it is nothing, worse than nothing—a bill of expense to get out of the way, in some cases costing more to remove than the original construction; but with the brick wall you get back more than enough to remove it, and much good material can be used again; and in the steel frame you save from 25 per cent to 50 per cent of the first cost of the material.

Another thing to be considered in the reinforced concrete structure as compared to a steel structure is the inconvenience that arises from connections that may have to be made to any part, for which provision was not made at the time of its construction. This will be patent to all who will give it a moment's thought.

After thoroughly weighing this subject at the present time, I must say that I give preference to steel construction over reinforced concrete, where the owner is willing to pay the small additional cost.

I consider reinforced concrete, as I before said, merely as another method of construction, and for the same reason that a man would put up a frame building because he cannot afford a brick building, a man would put up a reinforced concrete building because he cannot stand the additional expense of the steel frame building.

As to the fire-proofing qualities of reinforced concrete, I must say—for

although there is some prejudice against it—I personally believe in its fire-proofing qualities, and have no prejudice against it; in fact, am heartily in favor of concrete for fire-proofing and for reinforced floors. Its plastic nature lends it very advantageously for this purpose.

Though I am supposed to have been talking against reinforced concrete, yet after all is said and done, it is merely a criticism of reinforced concrete, and in no way to be considered a "knocking" of this method of construction. I believe for ages to come there will be room for all the different methods of building construction—the frame building, the brick building, the steel frame and the reinforced concrete building, each to be adapted for the purposes and the conditions under which it will be used, and it entirely depends upon the discretion of the architect, the amount of money to be expended and the purposes for which the building is to be used, as to the method of construction that will be used.

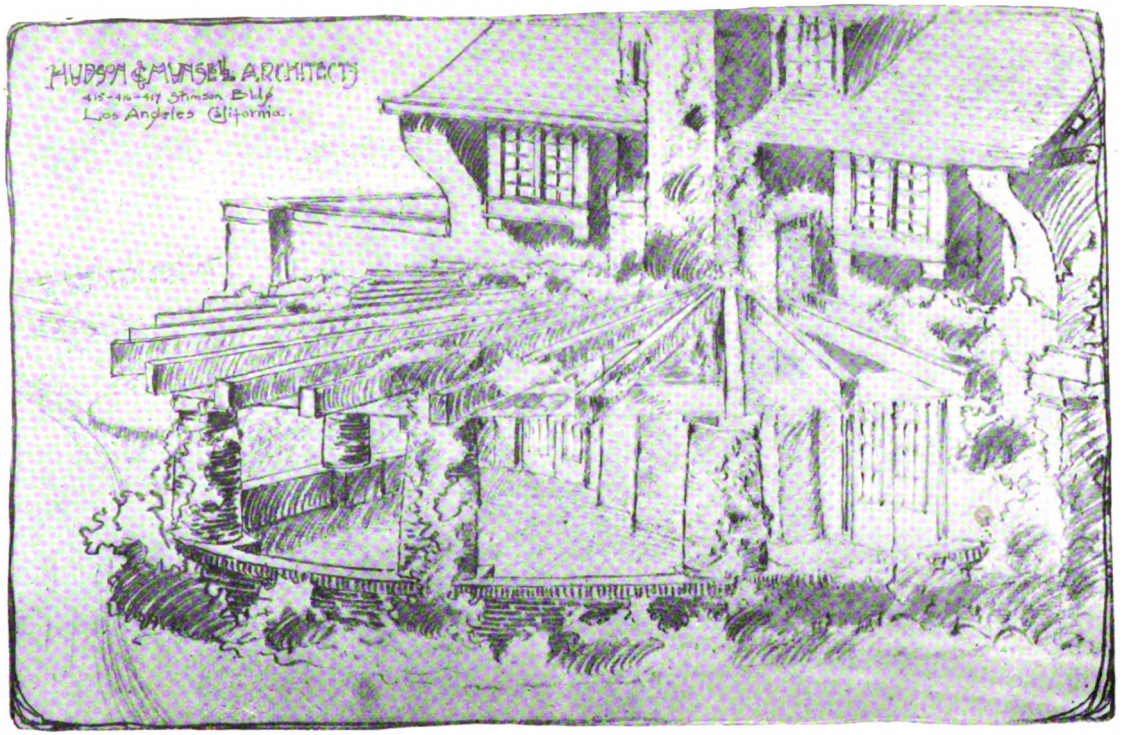
In what I have said I have not attempted to be in any manner technical. My statements have, perhaps, been rather rambling, for I have realized that the competent architect can make a successful building of any method of construction that might be determined upon.

Reinforced Concrete Their Theme

THE regular meeting of the Southern California Chapter of the American Institute of Architects was held November 21st at the Banquet hall of the Cafe Bristol in Los Angeles. Covers were laid for twenty-five.

The meeting was called to order at 7:45 o'clock and after the election to membership of Mr. Timothy Walsh, member of the Board Chapter of American Institute of Architects, the subject of the evening, "Reinforced Concrete," was taken up. Intensely interesting papers were read by Charles F. Whittlesey, Geo. H. Wyman and Octavius Morgan, and they were fully discussed by all members present with special remarks and references by Messrs. Carl Leonardt, Theo. A. Eisen, Chas. F. Whittlesey, Octavius Morgan and John P. Krempel. The papers are published elsewhere in this number of the Architect and Engineer. The following officers were elected: President, A. F. Rosenheim; Vice-president, John Parkinson; Treasurer, August Wockenbaith; Secretary, Fernand Parmenter. Entertainment Committee—John P. Krempel, Theo. A. Eisen. Press Committee—Octavius Morgan, J. Lee Burton, Fernand Parmenter.

Alfred F. Rosenheim, who was re-elected President of the Chapter, came to California from St. Louis in February, 1903, to construct the H. W. Hellman building in Los Angeles. Mr. Rosenheim studied at the Massachusetts Institution of Technology, and after leaving that institution was employed in the office of no less than six prominent architectural firms in Boston. Returning to St. Louis in January, 1886, Mr. Rosenheim established a clientele which he retained up to the time of coming to California. He built many important structures in St. Louis and has buildings to show from Boston to Los Angeles and from Minneapolis to New Orleans. He is a charter member of St. Louis Chapter, A. I. A., and has been a member of the American Institute of Architects since 1899. He was a member of its Board of Directors in 1895 and has frequently been sent to conventions as delegate from the Institute.



Detail Sketch showing Semi-circular Pergola, Capt. C. E. Thoms' Residence, Los Angeles
Hudson & Munsell, Architects

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Reinforced Concrete

By HARRISON ALBRIGHT, ARCHITECT

CONCRETE is commonly understood to be a conglomerate of broken stone or gravel, sand and cement, thoroughly mixed with water and tamped in place.

It was the material most extensively used by the Romans, and in strength and durability no mass, however hard the stone or large the blocks, equals the walls of concrete which they built, and which can only be destroyed by a laborious process like that of quarrying stone from its native bed.

The Pantheon of Rome, about 2000 years old, is covered by a dome 142 feet 6 inches in diameter, cast in concrete, being one solid mass, covering the building like a shell.

Reinforced concrete is concrete in which has been imbedded steel bars of the proper form and size and in the proper position for the purpose of resisting tensile stresses.

In 1849 Lambol de Minoval built a boat of concrete in which he imbedded steel netting. In 1855 he exhibited this boat at the World's Fair at Pasis and it was then credited as being the first reinforced concrete structure.

In 1867 Monier, a French gardener, used the same principles in constructing flower boxes, small water tanks and the like, and to him was issued the first patents on reinforced concrete construction. Soon after this its use was extended to the construction of floor slabs, pipes, etc.

Hennebique is credited with being the first to adapt the principle of reinforced concrete to columns, beams, etc. Companies operating under his patents have erected buildings which have cost upwards of $60,000,000. Numerous companies have been formed for the purpose of constructing buildings of reinforced concrete and they have erected, in all parts of the civilized world, buildings which, in the aggregate, have cost many millions of dollars.

Although the practical advantages of reinforced concrete were demonstrated long before theoretical analysis of its properties were entered into, there is still much hesitancy over its use, due, no doubt, to the want of an understanding of its true properties. However, tests, experiments and researches have been made as years have gone by, until today, formulas have been established whereby the architect and engineer can calculate to a nicety the results that will be attained under a given proposition.

The use of reinforced concrete has become so general and its importance has grown to such an extent that no architect or civil engineer can afford to be without a thorough knowledge of its properties and applications; for the time is fast coming when this type of construction will be more extensively used than all other types combined, and the architect or engineer who is not prepared to undertake the work will be in want of something to do. There is hardly anyone who will not concede that both concrete and steel are unexcelled building materials, and a proper combination of the two materials which makes reinforced concrete, must necessarily make IT all that can be desired.

The best authorities estimate that the tensile strength of the strongest concrete is only about one-tenth of its resistance to compression; therefore, the combination with concrete of a material which shall possess the requisite tensile strength, is the most serious problem in reinforced concrete. It is essential that the elasticity of the steel be so reduced that the steel and concrete shall act as integral components of the composite structure. This unity of action is secured by the use of twisted steel bars invented and patented by

Mr. E. L. Ransome and extensively used by him in buildings which he erected in various parts of the country.

The requisite reduction in the elongation of the steel is accomplished by twisting. The twisting also affords the most mechanical bond, being continuous throughout the entire length of the bar. It is also noteworthy that the ultimate strength of the steel is increased in the process of twisting, and that the twisting in itself is an effective test of the steel, for steel with inherent weakness will not twist.

The purpose of this paper is to point out to you some of the stumbling blocks which the beginner is apt to meet with in his first efforts in reinforced concrete construction, and what is essential to a successful outcome.

The ease with which reinforced concrete may be applied to almost any form of construction, and at the same time the necessity for properly reinforcing so as to counteract the effect of tensile strains and stresses, really divides the work into two heads—the architectural, and the engineering. Therefore, in works of importance it is desirable that the drawings be carefully gone over by an engineer of practical experience in this method of construction, for, while there is no method of construction under equal conditions that is as economical or more trustworthy, in order to secure a successful outcome, the work must be subjected to a rigid inspection at all times, and the contractor should be held responsible to the obtaining of certain specified test results. The most active inspection will not always prevent poor workmanship or faulty construction, either of which can destroy the strength of structures made of the best materials. The proportion of the concrete may not be in all parts according to the specifications; good judgment may not have been exercised in gauging the quantity of water. If too much water is added, the strength of the concrete and especially its co-efficient elasticity, will be decreased. If too little water be added, the adhesion of the concrete to the reinforcing metal will not be sufficient. Great care must be exercised in the inspection of materials that they be up to the standard required. All cement should be tested on the ground to ascertain its tensile and compressive strength and to establish the evenness in grade, and no cement should be used which shows disintegration in the boiling test. The sand must be carefully inspected to see that it is clean and free from impurities and not too fine —not over 25 per cent of its bulk should pass a 30-mesh sieve. The crushed rock must be hard and free from shale or decomposed particles, and not too coarse—all should pass a ¾-inch sieve. The steel, if not twisted, shall be tested to ascertain if its quality is correct. If twisted, the twist should be measured to ascertain if it has the correct number of turns per foot, according to size. Hard, or what is termed "high carbon steel," should not be used in tensional work as it is liable to snap when loaded. Quite as important as the quality of the material is the placing of the same. In order to secure the intended action of the steel, care must be exercised that it be placed on the lines of the stresses created in tension, shear or compression; otherwise its effectiveness will be lost in whatever degree it is misplaced. The misplacement of the reinforcing metal changes the construction from reinforced concrete to simply a protection of steel by concrete, and, unless the steel be excessively heavy, failure is sure to result. Care must also be taken with the concrete that the proper percentages of its component parts are properly massed and mixed, that the proper amount of clean water is incorporated. Great care must also be exercised in the placing and tamping the concrete in the forms in order to secure complete density throughout the entire mass and perfect contact over the entire surface of the reinforcing metal.

The National Cement Users Organization

By WILLIAM B. GESTER, C. E.

THE interests of concrete users and concrete building material makers are assuming an importance undreamed of a few years ago.

Ferro-concrete construction and the manufacture of concrete blocks for building purposes, in an almost bewildering variety of form, in every State in the Union, are increasing at a rate that is astonishing to all who have not made especial study of the reasons therefor. These reasons, boiled down, are simply inherent value and economy. They are so patent to all men who have seriously investigated modern building conditions that it is not to be wondered at that thousands of practical mechanics, previously engaged in other lines of building enterprise, should take up concrete building with enthusiasm. It is unfortunately true that some, perhaps many, without any previous knowledge of building materials or construction, have followed the impulse to undertake work in so promising a field of endeavor, but the mass of the newcomers in the field are not men of this class. Builders, brick and stone masons, carpenters and men of allied trades, by the score, are the main helpers in the renaissance of concrete construction.

The very wonderful growth of the industry during the past twelve months has proven the wisdom of the formation of the "National Association of Cement Users," made a year ago.

The second annual convention of this national organization of concrete men is advertised to take place at Milwaukee, Wis., during the week beginning January 9th next.

The convention will be held in the Armory Building, where abundant space has been set apart for what is confidently expected to be the most complete exhibit of appliances for cement and concrete work, special tools and machinery ever gathered in this country. All of the newest labor-saving devices will be operated and explained, and ample opportunity given for comparisons and exchange of views.

There can be no possible question of the great value to the whole industry and to every individual engaged in it, of this meeting of concrete manipulators.

A large number of prepared papers upon numerous phases of the business will be read, and these, with the subsequent discussions, will, without doubt, be full of interest and will be teeming with practical value.

A list of some of these papers follows, and a perusal of the subjects gives warrant to the prediction that interest will be deep and sustained throughout the meeting. Following is the schedule:

"Observations on the Testing and Use of Portland and Natural Cements," by E. S. Larned, C. E., Boston, Mass.

"The Tests of Concrete at St. Louis," by President R. L. Humphrey, Philadelphia, Penn.

"The Fire-Proofing Qualities of Concrete," by E. T. Cairns, chairman of the Committee on Cement for Building Construction, of the National Fire Protection Association, Chicago, Ills.

"Air Tamping of Concrete Blocks, and Conveying of Blocks," by J. P. Sherer, Milwaukee, Wis.

"Cement Block Architecture," by Louis H. Gibson, Indianapolis, Ind.

"Building Regulations Concerning Concrete," by Will J. Scoutt, Chicago, Ills.

"Water-proofing," by J. L. Mothershead, Indianapolis, Ind.

"Causes of Failures in the Concrete Block Business," by O. U. Miracle, Minneapolis, Minn.

"The Use of Cement and Concrete for Farm Purposes," by S. M. Woodward, U. S. Department of Agriculture, Washington, D. C.

"Reinforced Concrete," by C. A. P. Turner, Minneapolis, Minn.

"Concrete Mixers, Tampers and Other Machinery," by E. P. Kelly, New York City.

"Manufactured Stone," by J. C. McClenahan, New York City.

The Pacific Coast users of cement must make a long trip in order to attend this convention, and yet the matters involved are of so much interest that it is hoped they will be well, if not numerously, represented.

* * *

Leakage in Building Supplies

One of the experiences which fall to the lot of nearly every builder and contractor is the shortage of material of one kind or another which occurs during the erection of a building. In his estimate the builder knows to an almost certainty the exact amount of this thing or that ordered in the construction, and he bases his orders for supplies accordingly. As the work progresses he is apprised of the deficiency in bricks, cement, lumber or other articles ordered, and he scratches his head while he mentally wonders what has become of the property. It may amount to little or much, according to the honesty of his employes and the opportunity afforded to appropriate the goods without detection. In the aggregate it frequently sums up quite a noticeable figure and sometimes causes a considerable reduction in the profits of a contract. A recent cause of complaint is the disappearance of the empty cement sacks, which has led to a lively controversy between the building supply houses and the contractors. The cost of the unreturned bags is charged against the latter, and they in turn feel they are being unjustly treated. Several arrests were lately made for larceny of these cement sacks, followed by conviction and the imposing penitentiary or jail sentences. Viewed from a business standpoint, there is no more reason that a contractor should be robbed of building material than that a jeweler should be plundered of his gems or that a bank should suffer a loss of cash through the dishonesty of those it employs. In the latter instances theft is rare, while with the contractors it is so common that it scarcely excites comment, except some strongly-worded expletives from the victim when a shortage is reported. The why and wherefore that contractors are victimized is invariably attributable to a lack of system, a careless method of handing out supplies which is known in no other branch of business. Were contractors to adopt the practice of other business men this leakage would soon cease. Let them employ a checking system and hold the man in charge of the supplies accountable for whatever is given out, whether it be a steel girder, a keg of nails or a sack of cement, the empty of which must be returned to his keeping. Should a leakage appear under these conditions it could be easily traced and the responsibility placed where it belongs. The loose way that things are managed by a majority of contractors is an invitation, to those dishonestly inclined, to steal, and the marvel is not that this looting of supplies exists, but that it is confined to such a limited extent. Look out for the leaks—that way the profit goes.

Tile Roofs

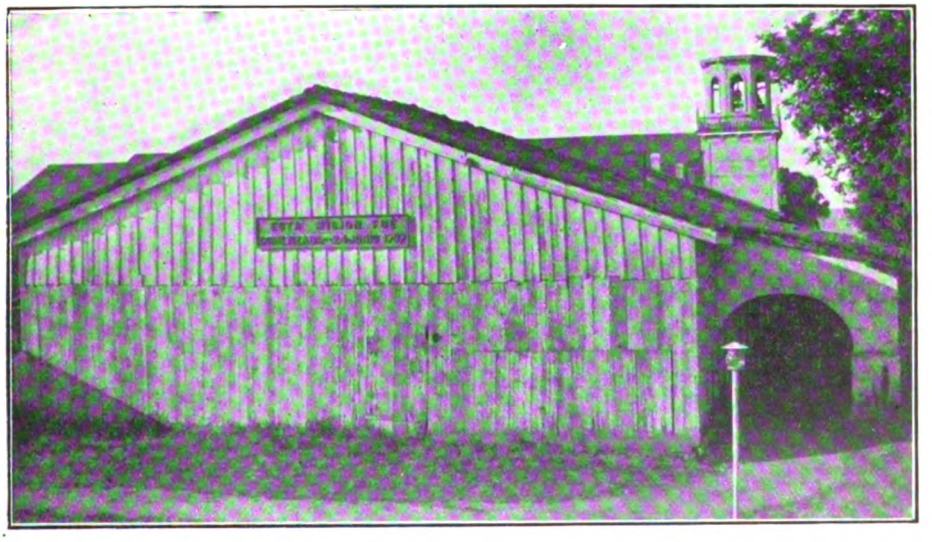
By W. E. DENNISON, President of the Steiger Brick & Terra Cotta Co.

THE desire for shelter having ever furnished the ruling motive for house building among all races in all ages, it follows naturally that the most important part of any building is that which affords the shelter.

Primordial man in all regions must have found shelter in caves, beneath overhanging rocks, or under the leafy boughs of trees. When driven thence by his predatory neighbors, the necessity for shelter became the mother of invention, and invention begat the roof. Reeds and grasses and leaves were gathered and leaned against the cliffs or hung across the recumbent trunks and limbs of fallen trees, or placed upon conveniently disposed stones. Probably thus the thatch constituted the first roof made with hands, and the roof ever since, in all its variety of forms and materials, has screened the frailties, sheltered the hopes, quieted the fears and safeguarded the dreams of man.

The architecture of many countries has treated the roof not only as an essential part of the house, but even its characteristic feature—as witness the Mansard roof over many palatial public and private buildings of France, the picturesque roofs ornamenting the ancient chateaux of France and houses of Turin and many interesting examples in England.

Taking the Greeks as the arbiters of architectural taste, we should never erect a building which does not show the roof in the most distinct manner. While they borrowed much from the Orientals, they never copied the flat roofs of Persia and Arabia. The roofs of Greece invariably slope and afford the best possible protection from the rains while completing the symmetrical effect of the design. Gothic architecture, a term applied in derision and meaning clumsy and awkward, went to the extreme of running roofs up to great heights, breaking them up into all sorts of odd shapes and sticking them full of fancy windows. Our English ancestors were given particularly to this aberration, with the result that there are probably more haunted houses in England than in all the rest of the habitable world.



Mission San Juan Baptista C-270

The roof should then be visible and should express as simply as possible the completion of the design of the building, and just as unmistakably as the shapely beaver tile surmounts with becoming dignity the faultless broadcloth. But as we see many men whose sense of congruity is expressed by the combination of an overcoat and a Panama hat, we find some architects whose ideas seem to be that a roof is primarily a signal, for we see their creations come sailing down the line of vision like the gaudy bunting of a full-dressed ship. As men milliners they would design a blue bonnet with a flower garden on it to match a black dress trimmed in green.

Roofs are distinguished by (1) their form of construction, comprising the flat roofs of dry, tropical countries and of commercial buildings so common to this country, and the sloping roofs variously known as gabled, hipped, pent house, mansard and gambrel roofs; and by (2) the materials composing them, such as thatched, shingled, battened, slated, tiled, metal covered, tarred, asphalted and gravelled.

It being the chief office of the roof to afford shelter, that material which has the most endurance should be selected for the roofs of buildings designed to have great permanence.

We believe there is but one style of roof in this country which can bring the testimony of a hundred years to prove its worth. So far as we know the first roof of any magnitude in California covered the Mission San Diego de Alcala. This mission was founded July 16, 1769, by Junipero Serra the great missionary padre. It was the first of that great chain of missions, extending from San Diego to Sonoma, where stands the last, founded July 4, 1823. Every one of these missions had a roof of terra cotta tiles. These tiles were moulded of clay, familiarly known as adobe, found near the mission sites, and when sun-dried were placed in rude kilns and burned to the temper and color of an ordinary common brick. Each tile represented the half of a truncated cone split lengthwise. They were laid on the roof without nails.

Another View of Mission San Juan Baptista C-271

This roof, besides being impervious to rain, affords the best possible method of refracting the sun's rays. That they have outlasted a hundred years and are apparently good for another century, is well attested by the mission at San Juan—photographs of which are shown in this number.

Heating, Lighting and Electrical Work

Heating and Dust

By Prof. W. F. BARRETT

ALL heating appliances depend upon the transference and heat from some source to the parts of the building it is intended to warm. This transfer can be effected in three ways: By the slow process of conduction, by the quicker process of convection, or by the swift process of radiation. In the case of hot-water pipes all three processes are at work, the heat is conducted through the iron pipes, which warm the room both by radiation and convection. In the case of an open fire, radiation is practically the only agent by which the heat is distributed to the persons in and to the walls of the room. As the air is almost as transparent to radiant heat as it is to light, the air of a room cannot be warmed by radiation, and hence our domestic open fire-grates warm the room indirectly by heating the floor, walls and furniture, and these absorbing the radiant heat warm the adjacent air by convection. This latter process consists in the transfer of heat by moving masses of the warmed air or other fluid, the motive force being gravity, the colder denser air displacing the lighter warm air. These currents are the means by which all fluids are heated, as both gases and liquids are very bad conductors of heat.

In all systems of heating by radiators the air is warmed; the walls of the room are therefore cooler than the air, and it is a matter of common observation that when this is the case the walls become rapidly covered with dust and dirt. On the other hand, when the room is warmed by an open fire the air is not heated by the radiation from the fire, but the walls are, and it is the warm walls which warm the room. When this is the case, the air being cooler than the walls, much less dust and smoke are deposited on the walls, which therefore remain cleaner much longer than in a room which is heated by warm air. This is notably seen in the difference between the wall-papers in a room heated by an open fire and a room heated by a stove; in this latter case the wall-papers become rapidly disfigured and dirty by an unsightly deposit of dust. Many are under the impression that this is due to the dust and dirt caused by the stove or the leakage of smoke through the joints in the stovepipes, but that this is not the case is seen from the fact that gas stoves give rise to precisely similar dirtying of the walls as coke stoves, and so do systems of heating by hot air. In fact, every one must have noticed the upward stream of dust and dirt that attaches itself to the wall in the immediate neighborhood of a radiator, whether that radiator be warmed by hot water, steam or gas. So great and so constant is this disfigurement that

it has been urged as an objection to the use of radiators and heating by hot-water pipes; and in some cases radiators are placed in the middle of a room or far from the walls to get rid of this annoyance. The same thing may be noticed where hot-water pipes run along the wall; near the pipes this wall gets blackened.

Clearly it cannot be due to any dust created by the radiators, for they are perfectly clean surfaces. It is, therefore, a matter of some importance to try and ascertain the cause, and then, if possible, remedy this defect in the use of all radiators. For this purpose we must turn to physics, and the investigations of Aitken, Scotland and Lodge in England on the phenomena of the deposition of dust have in recent years given us the solution.

Many years ago Professor Tyndall noticed that when dusty air was strongly illuminated by a sunbeam or by the electric light there rose from the summit of any heated body placed within the dusty air a stream of dust-free air. This was rendered apparent by its not scattering the light; and hence a fine black stream was seen rising from the hot body. Any one can see this by heating a wire or rod of metal and putting it in a glass vessel filled with smoke; upon brilliantly illuminating the smoke a sharp black line will be seen above the hot line or rod. Tyndall, Franklin and Lord Raleigh have given different explanations of this experiment, but none were satisfactory. Professor, now Sir, Oliver Lodge and his demonstrator, Mr. J. W. Clark, took up the matter and made numerous experiments. Almost simultaneously Mr. Aitken in Scotland began working at the matter and arrived at much the same explanation as Professor Lodge.

The general result of all these experiments showed that the invariable tendency of fine dust particles is to deposit themselves on any neighboring cold surface. The dust-free stream of air rising from a hot body is caused by the warm body being surrounded by a dust-free coating of air, and the ascending current of warm air carries this dust-free layer with it, giving rise to the dark stream line seen above the warm body.

Many striking experiments were made by Mr. Aitken to show the tendency of dust to leave a warm-surface and attach itself to a cooler surface. Thus, if two mirrors, one hot and the other cold, are fixed face to face near to each other and placed for a few minutes in a vessel filled with a dense cloud of dust, formed by burning a little magnesium wire within the vessel, it will be found when the mirrors are removed that the warm mirror is perfectly clean, while the cold one is coated over with magnesia dust. Or, if two glass rods, one cold and the other hot, are dipped into some hot magnesia powder and then taken out, the warm rod will be found to come out quite clean, but the cold rod is thickly coated with powder.

But the most interesting illustration of the repulsion of dust from a warmer surface to a cooler surface is seen on partitions of timber-framing plastered and plastered ceilings. Wherever the wood framing or joists occur the wall is clean, whereas the rest of the surface is darkened by adherent dust. In fact the wall or ceiling appears to become transparent, showing the wooden studs through the plaster. This is due to the fact that the wood, being a bad conductor of heat, remains warmer than the adjacent plaster, and hence the dust leaves the part where the wood is beneath and attaches to the cooler plaster.

It looks as if the old idea of a repulsive force produced by heat was, after all, correct. In fact, if we heat in a crucible any fine incombustible powder, such as magnesia or silica, we shall see the particles of the powder become self-repellant and mobile like a liquid. Heat, we know, does lessen the cohesion of bodies, making a rigid and brittle body, like glass, ductile and

viscous; it does drive the molecules of bodies farther apart, causing a cubic inch of water to become nearly a cubic foot of steam, or 273 cubic feet of air at freezing point to become 373 cubic feet at the boiling point. But the expansion and the change of state from solid to liquid and liquid gas to gas produced by heat is due to the greater amplitude of vibration, the increased width of the swing, of the molecules of a body, and does not necessarily involve a repulsive force radiated from the hot body, though its kinetic energy is increased by heat.

Here we have a practical means of filtering air from dust. It is only necessary to have two concentric tubes, the inner tube conveying the steam and the outer one kept cold; any dusty air passed between the hot and cold tube will deposit its dust on the inner surface of the cold tube, and much finer dust or germs can be so deposited than can be stopped by filtering through ordinary screens.

* * *

Babies Wanted in these Flats

Milwaukee, Wis,, is the possessor of a new kind of philanthropist, to-wit: "The Baby-Flat Landlord."

Gen. Louis Auer, ex-politician, national guard officer, real estate man and good fellow, is building five apartment houses in Centre Park. Each will hold 39 families. These are the baby flats.

"I am a great believer in babies," said General Auer in talking of his buildings. "Some people think my views antiquated, but this question of race suicide is greater than people think.

"I am thoroughly in earnest when I say I am in favor of President Roosevelt's stand on this question. There should be from five to seven children in every family.

"It is the duty of every married couple to raise children and plenty of them. If they have six, and then come twins or triplets, so much the better.

"Today we see too many young couples living in apartment houses. Children are forbidden, and they have none. There are too many families with one, two and three children.

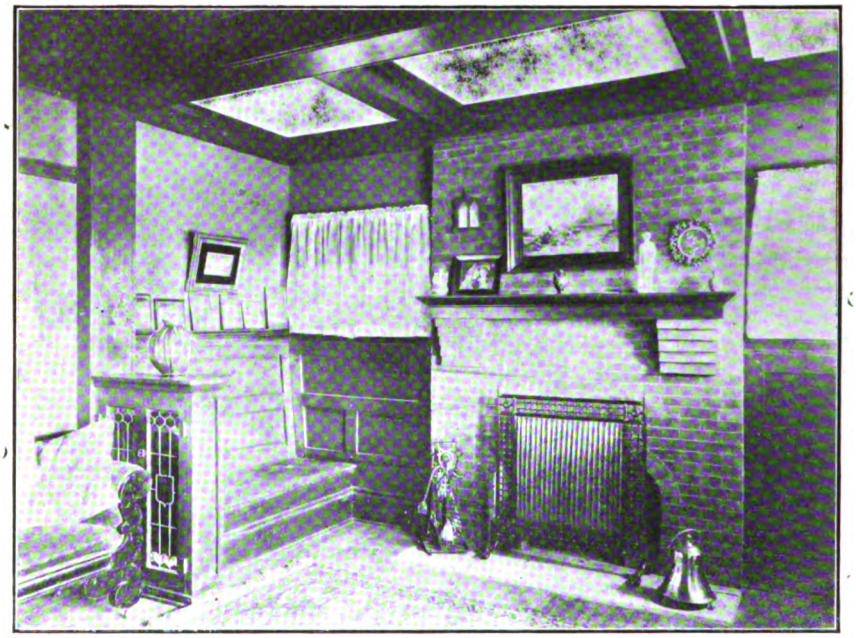
"So you can see how I happened to conceive the idea of the baby flats. I thought that I, too, would offer inducements to stem this tide of race suicide.

"I will give one or two months' rental to the parents of every child born in the apartments. The family without children will not be barred from the buildings, but we especially invite families with children, many of them.

"No expense has been spared in making the flooring as noiseless as possible. We claim that the buildings are as complete as possible in this respect. Let the youngsters romp.

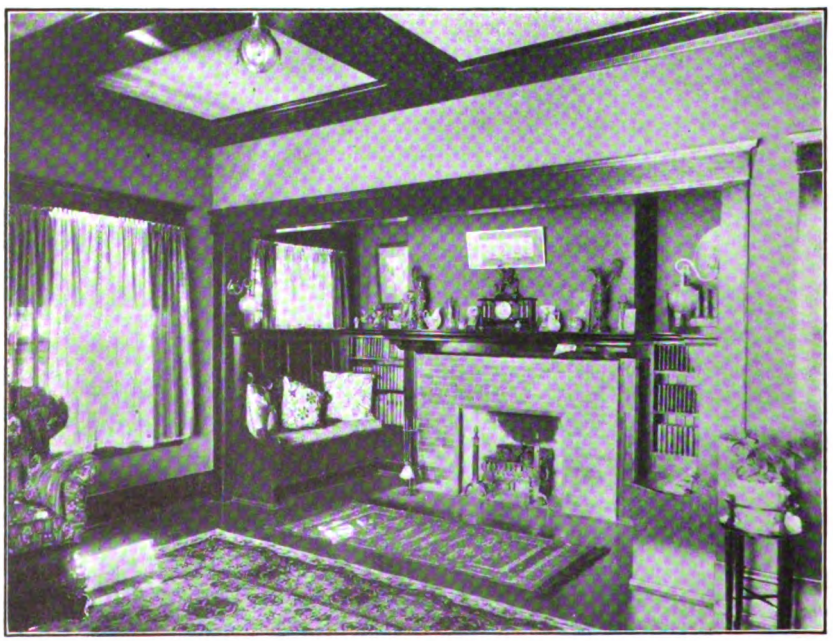
"But the big feature is to be the playground in the rear. When the apartment buildings are all complete there will be a big square. This is for the exclusive use of the children. All the paraphernalia of an up-to-date playground will be provided.

"When the expenses and income of the flats have adjusted themselves I may see fit to increase that prize for babies."—Architects and Builders' Journal.



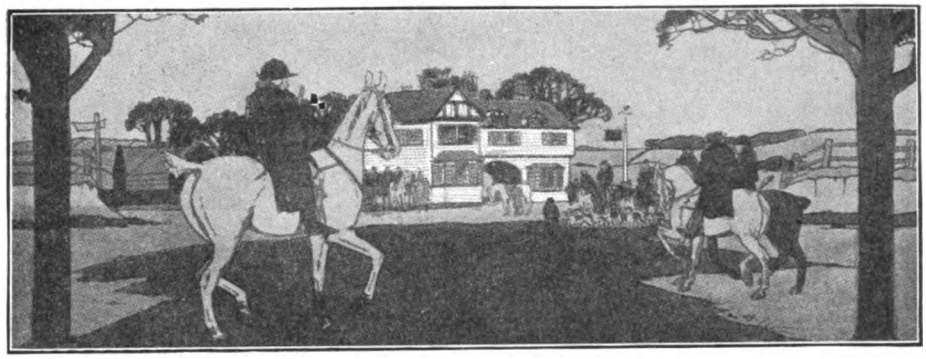
Corner of Living Room in Cochran Residence, Hollywood
R. Mackay Fripp, Architect

C-272



Living Room in the Graves' Residence, Los Angeles
R. Mackay Fripp, Architect

C-273



Interior Decoration Up-to-Date Furnishing

New Wall-papers

This is a busy month for both housekeeper and decorator. Fortunate the woman who returned to town before the fall rush of redecorating set in, for never was there greater activity in the way of doing over houses and apartments. Now that prices for apartments are keeping pace with the best residences, the decorator is pressed into ceaseless service to provide the new and the novel. Extreme effects are rather disastrous in an apartment, a fact often overlooked by the mistress.

An Athenian thirst for novelty is the root of much inferior work in the house-furnishing line. Women are often accused of wanting what every other woman has. This may be true of bonnets; it is never true of wall-papers.

A leading New York decorator takes a hopeful view of the situation. In discussing the question, he says:

"Every year shows a big increase in the number of householders who show more or less anxiety on the subject of gaining harmony and artistic effect in their house decorations. Unquestionably people are paying more attention to art than they did twenty years ago, when I started in this business.

"I don't say that there are not many who will sacrifice art to novelty, but the number is lessening. At the same time, fortunately for business, people like new things.

"Instinctively some women know exactly what to choose in order to get the best results; others rely entirely on a decorator or a salesman. For the last ten days I have been called in consultation oftener on the subject

ENTRANCE TO PATHWAY
FROM MAIN DRIVE AT
CLAREMONT
BERKELEY, CAL.

John Galen Howard, Architect C-274

of living rooms, dining rooms and halls than of other rooms. Why, I cannot explain, unless it is that so many of our customers live in apartments and prefer to put expense on rooms which are most in evidence, saving on sleeping rooms—a poor custom.

"In most of these cases I have recommended something like this: For the modest drawing room there is no wall covering more desirable than some of the new papers of satin finish, even to the shadow or sheen which distinguishes damask.

"Here is an example," and the decorator spread out a roll of paper, heavy, pliable as cloth, and which was a reseda green, self-toned damask paper.

"We use no frieze with this paper, and the ceiling is usually cream white to match the woodwork of the room, which preferably ought to be white. If, however, the woodwork is darker, it were better to tint the ceiling a neutral tint which will harmonize with the paper and woodwork, and not present a startling contrast.

"Soft tones, such as greens, ecru, brown, yellow and rose, are preferred to the gayer ones, and the woman who is on the lookout for harmony is careful to match her wall-paper to the color most pronounced in the groundwork or background of her furniture covering. To illustrate:

"I had a customer yesterday who came in carrying a long strip of heavy brocade which represented her parlor furniture. It was a Louis XVI. effect of rosebuds and russet leaves against a background which was neither gray nor ecru, but a cross between the two—a most difficult color to match.

"I agreed with her that the wall-paper ought to approach as nearly as possible to that color, and I went to work to match it. Before long I gave up the idea of a brocade paper, although my customer's heart was set on it, and turned to the fabric papers, which are as new as anything now in the market, the designs called homespun leading off, and representing an astonishing variety of neutral shades as well as brighter colors.

"With these fabric papers we sometimes use a frieze and also what we call an upper third effect of a pattern paper of conventional or other design. These homespun papers, by the way, have quite driven out cartridge papers, although they cost more, and it is a long time since we have had anything at a moderate price quite so charming.

"Here is a variety of the fabric papers in which the originality of the frieze idea is shown to advantage. Just take a look at these."

The decorator spread over a form a roll of plain paper topped with a landscape frieze which showed the tops of trees behind a hill. Another had tall growing trees in the foreground, a third was a marine view, the outline of sailing craft showing in the distance, and the impressionist school was followed in all the designs, which in no case presented startling contrasts of color, but harmonized perfectly with the wallpaper.

"But to go back to the lady and her sample: It could not be matched, I found, in the hundreds of shades the homespuns offered, and therefore she decided to go to a trifle more expense and have her walls covered with a fine-quality grass cloth, which matched the sample perfectly.

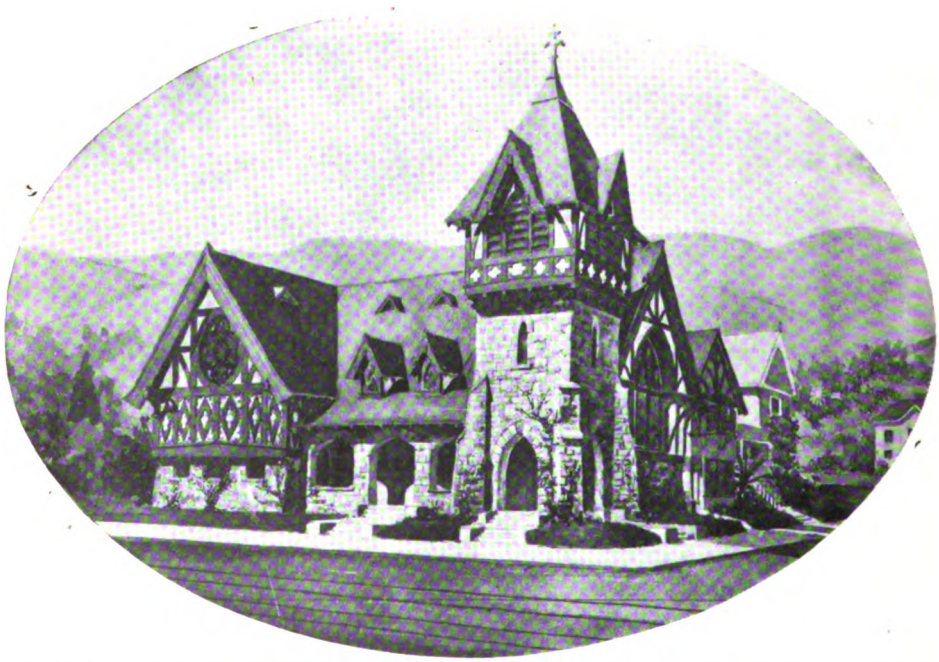
"One of the most popular combinations of paper for a dining room of medium size and modest appointments is a plain fabric wall-paper, put on to a height of six or seven feet if the room is about nine or ten feet high, and finished with an upper third of paper to match. This is covered with a conventional design, either self-toned or in two tones, a shelf molding separating the two.

"This molding is about four inches wide, and a couple of narrow grooves run its length to support upright plates and saucers.

"We are using the same thing extensively in libraries, the shelf molding serving as a receptacle for pictures, which rest in the grooves instead of being hung.

"To the anxious inquiries after something attractive in a hall wall-paper I recommend these broad stripes—self-toned, of quiet colors. For the time being the fancy for gayly colored hall paper has disappeared—that is, among shoppers of taste—and the output of the manufacturers emphasizes broad stripes for this purpose rather than conventional designs.

"For bedrooms, on the contrary, flower effects lead all others, the designs for the most part being large. No matter how bright in color the garlands and bouquets on the chintz papers may be—and the chintz papers are perhaps the favorites—the background is neutral in tone. In using these chintz papers they are joined to the cove with a narrow picture molding only. There is no frieze."



Epworth M. E. Church, South, Berkeley *C. W. Dickey, Architect* C-275

The City Beautiful

The Real Spotless Town

By JOHN H. HARTOG, Manager Alameda Advancement Association

WE HAVE all seen the advertisements of "spotless town" and smilingly admired the artist's ingenuity. Few people realize that there is one unpretentious little city right here in California that is an inspiration for anyone who wants to depict the "town sans spots." This beautiful town lies across the bay from San Francisco and is known as Alameda.

Alameda, up to last summer, was just like all cities of like size; it had pretty homes and good pavements, but it lacked that finishing touch which is the pride of most cities in the "old country," where the chances for amassing a fortune "while you wait" do not monopolize the people's energies, hence allow them more time to see themselves as others see them. Especially is this true in picturesque Holland, where one sees cattle with blankets on and their tails tied up with blue ribbon, and where it is each housemaid's duty to scrub the yellow brick sidewalk.

No one denies that Holland is the cleanest country in the world, aye, that the love for cleanliness borders on a craze. No one with a soul for the artistic contradicts the quaint beauty of its architecture. But try and picture to yourself one of those unique Dutch streets, but with it sidewalks overgrown, its vacant property wildernesses and its trees odd shapes and sizes and dead or missing here or there. What good would the pretty architecture be with such uncongenial surroundings?

It is only in recent years that we in this country have taken breath to look around us and come to a realization that a beautiful residence alongside of an ugly wilderness is an incongruity that jars on the sensibilities of anyone blessed with any degree of finer feeling.

Improvement clubs are springing up in every city and in most every part of every city. All are doing some good. Some more, others less. But even the least is commendable.

It takes education to create taste. It takes taste to create the demand. Traveling is admitted to be a great educator. No one, for instance, who has once seen the splendid system of street cleaning in Sydney, N. S. W., ever forgets how before the people are astir, the main streets, paved with perpendicular wood-blocks laid on concrete, are washed with a hose and swept and sanded and when you come into that city you are impressed, the impression packs itself in your "luggage" and like your conscience, it is everlastingly with you. Henceforth filthy streets are an abomination to you. But you are alone, like one crying in the desert. Others who have lived all their lives among unkempt surroundings, listen to you and laugh at your

aestheticism. But some more go and return; they too are impressed by the same thing, albeit it, in other countries. You are no longer alone. The idea commences to gain strength and lo and behold, at last it becomes an irresistible force that overrides all obstacles and secures the desired improvement, be it in pavement, or sidewalk, or vacant lot or fences. True, to some extent the love for cleanliness and beauty is born, not made. But that love lingers to some degree in the breast of everybody, barring degenerates, even though it lie so dormant that one would fain disbelieve its existence.

I remember showing a millionaire manufacturer from this country a factory in Europe, which is the non plus ultra for exterior beauty and interior cleanliness. Feeling quite sure that his soul absorbed the same delight in beholding this splendid temple of industry that mine did, I said to him: "Now, if I had the millions you have, I would on returning to America, tear down the rotten old shacks you have and build something like this. It would be a better advertisement than anything you could do and would be a daily delight to you and all the thousands you employ." And what was his answer? Did he fathom the suggestion? Did he realize that such enjoyment as I mentioned would be the greatest that his untold wealth could create for him? No, he floored me with a counter-question: "How much more money would I make by having such a fancy front?"

Well there was a time when a man was afraid to dress well for fear he would be called a fop; to trim his nails and keep them white for fear he would offend those who can't. But that time is passing.

Once upon a time there was an old fool, upon whom God had bestowed enormous wealth to see what he would do with it. But money did not make a gentleman out of this man of piggish tastes. He was slovenly and greasy, dirty and unattractive and kept on piling up millions. And the younger generation saw and decided that in order to become wealthy it was a condition sine qua non that one must be untidy and careless of appearances. And so they grew up and imitated the bad example. But that folly is wearing out.

So with cities. Talk to the people in some cities and berate them for their filth and dirt, their smoke and grime and they will parrot the absurd reply: "Oh, this is a hustling town. We are too busy to tidy up."

There you have the previous idea all over again. Too busy to be clean!

Now in this city, in Alameda, the people are pretty busy too. Enter their offices in San Francisco and no busier people will you find anywhere. But it doesn't take them very much time to send their financial support once a month or once a year to an association, whose business it is to plan out and think out and act out the very things required to make life more attractive and for which the business men themselves do not have the time.

And so in addition to several improvement clubs which are more particularly interested in the wants of their own locality, there came into being one organization, with a headquarters and a regularly organized working force and in six months time this city has become the cleanest, neatest city in the State, aye, maybe in the country.

First of all a census was taken of all unsightly lots and sidewalks. If you will stop and think of it, you may realize what a task this is in itself, for it would be worse than useless unless you secured the name and the address of the owners and the dimensions of the properties, in order to quote estimates for work to be done.

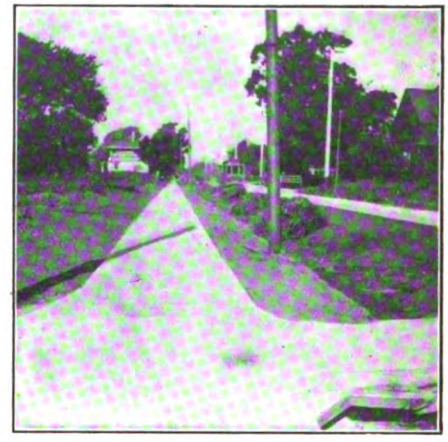
To write to all of these, once, twice and in some stubborn cases, three times is another laborious task. Then the real work commences. A cleaning force has to be organized, the men taught to do the work effectively and

economically, for a properly trained man can do more work in one day than two green or unwilling workers.

It was no easy task to get people to consent to let us clean up. And yet we found many exceptions. Many people realized that our efforts were sincere, that our argument for a cleaner city and a more valuable one had the true ring and these owners readily consented. Some had to be urged, threatened or cajoled. A few, a very few, there were who simply turned a deaf ear to our entreaties and being both Eastern people it was hardly feasible to send a policeman to arrest them.

Strange to say both were newspaper people! The only thing to be regretted is that these unwilling spirits are going to benefit by the results in spite of their actions.

C-276



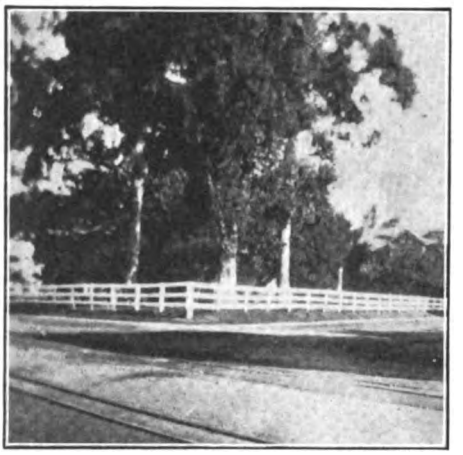
C-277

The first picture with this article shows a condition that you can find in your own city, no matter where you live, for all American cities are suffering from this same trouble in greater or lesser measure. The cart on the streets belongs to the city. The Street Department worked in harmony with our efforts, realizing that an improved condition of the streets, would eventually redound to its own glory. The second picture shows the same corner cleaned up. This is at the southwest corner of Union street and San Jose avenue.

The piles in the street, are mainly dirt shoveled off from the sidewalk strips and partly brush and weeds. Most of the weeds, however, are first burnt off. Then they are cut out root and all and where the ground is above grade it is leveled to or slightly below the cement walk. Failing this, the loose dirt keeps spilling over the cement and is a decided nuisance in dry weather, while in the rainy seasons it causes the water to stand on the very strip which was laid down to give pedestrians a clear pathway.

In going about the city at present one can tell just where our experienced gang of men did the work and where it was done by unexperienced labor at the expense of the owner, who was willing to obey the city ordinance but wasn't going to let us have the glory and pleasure (?) of doing the needful.

Strange to relate, the good example became infectious and all last summer one would see little "gangs" of children imitating us and generally one of the band was doing the ordering and let the others do the hoeing and sweeping. That one will grow up to be a politician and he'll boss some ill-started town, or I miss my guess.



C-278

Every city has more or less lots, termed "vacant lots." Erroneous appellation, exclaimed a divine in his sermon on our work, for they are not vacant, he maintained. No lot can be vacant, that is full of weeds. So this preacher said.

Alameda can show you what to do with them. Out of the many, whose appearance has been metamorphosized from an ill-kempt eye-sore to a space, pleasant to look upon, the following is a fair sample. It is located at the intersection of Encinal and Central avenues and while a black and white reproduction gives but a poor idea of the reality, the most aesthetic will admit that to have such a vacant lot to look out upon is no sore trial to the abutting residents.

Another item that sadly needs the strong hand of the law, or still better, the equally strong hand of public sentiment, is the craze existing among real estate agents to put signs all over property telling you that it is for sale. Imagine a church, theater, hotel or club-house which, instead of one sign on its front telling the anxious gazer its name, should have its name or functions pasted, nailed or painted over, on and under every window! Yet when a piece of property or a residence becomes for sale, lo and behold, at once the hustling agent damns it forthwith by plastering it all over with "for sale" signs. Wouldn't one neat sign do just as well? One lot had a sign about twenty feet high, by thirty wide, announcing the agent's name in letters eight feet tall. So far, so good. Everybody to his taste, as the French say. But in front of each supporting post, was a smaller sign, giving you identically the same information. One couldn't help but recall the story of the brilliant man who cut a hole in the door for the cat and then at great cost of labor and time cut a smaller opening for the kitten. Let us charitably suppose that the small sign was for ordinary mortals and the large one for near-sighted buyers.

Then again, where agents are satisfied to put just one sign on a piece of property, it often is a fact, that several others follow suit, with the result that in some instances one lot would bear the names of six or more agents.

Now what are the facts in prospective real estate transactions? Did you ever buy a piece of property? Probably you did. And of course you went right down to the property, carefully jotted down the name and address of the real estate man and while you had one or more good friends in the real estate business, whom you were anxious to favor or preferred to trade through, you cruelly neglected your friend or the man in whom you had confidence and went instead to the stranger whose name was on the sign.

As the German comedian says: Yes? No?

The Alameda Advancement Asociation opened its headquarters on the main floor of a business building on the principal business thoroughfare in Alameda on June 12th, 1905, and organized its cleaning gang exactly one month later. The last laborer was laid off November 11th. In these four months nearly 300,000 square feet of unsightliness have been wiped out. Not only that. Virtue is its own reward. So in lieu thereof as many square feet of neatness have taken its place proclaiming to all the world for cleanliness, and decency. In addition to that, fully as much more similar work was done at our request, but directly by the owner or occupant.

Builders' Exchange

The Mission of the Builders' Exchange

BUILDERS' exchanges in some cities of the country are of late becoming imbued with the ideas of enlarged magnitude on the subject of exhibits or displays of building material, and these ideas are not only good things themselves, but are putting new life and zest into such builders' exchanges as are taking them up. Cleveland and Philadelphia have worked out some good plans on this enlarged idea of permanent exhibits, and now Baltimore has caught the spirit, too, and has leased for a term of years quite a large space on the fifth floor of the Builders' Exchange to be used as display room for permanent exhibits of building materials. In practically all cities where there is a Building Contractors' Exchange, some effort is nearly always made at displaying building material, but many of these efforts instead of being fostered by the exchange, are really more the result of business enterprise on the part of manufacturers and their representatives in getting samples of their ware on display together with desk room where they can be seen and be in close touch with building contractors who gather at the exchange.

While this all helps a little, it is but a small step in the direction of bringing contractors and manufacturers of building material in close touch, and the enlarging of these ideas and fostering their expansion by builders' exchanges if properly carried out, can do lots of good, both for the members of the exchange themselves and for the manufacturers of building material. It not only saves time and facilitates business in many ways, but it adds strength and life to the builders' exchange itself. An example confirming this idea is to be had from Cleveland where the establishment of a permanent exhibit on a somewhat extensive scale has not only practically saved the old builders' exchange from going out of existence, but has put some life into it, and made it many times more useful to its members and to the city at large than it ever was before.

A description of the new Cleveland Exchange quarters at hand says that the entire floor space comprises 6,205 square feet, a portion of which is devoted to the exchange proper, and the balance given over to exhibition purposes and to desk room space, presumably both for the members of the exchange and manufacturers' agents who have displays there. The exchange is equipped with all modern conveniences and appliances, including smoking and reading rooms, rooms for private consultations, etc., and made as inviting in every way as possible. The daily attendance at the exchange is said to average more than 200, which is good evidence not only of the advertising advantages of the display, but also shows the live interest being taken by virtue of the enlarged ideas and increased facilities for doing business. What has been done in Cleveland can be done in any enterprising city if gone about in the right manner, and it is altogether a good idea that is respectfully commended to the attention of builders' exchanges.—The Clay Worker.

Among the Architects

Information contained in this publication is gathered from the most reliable sources accessible, but to make it absolutely accurate the publishers urge the co-operation of the members of the profession :: :: ::

BUILDING NEWS.

Municipal Building, Seattle, Washington. Cost $175,000. Architect Clayton D. Wilson, of Cleveland, recently of Los Angeles. The Board of Public Works of Seattle will advertise for bids at once for the erection of this building, which will be of stone, brick and steel, and fireproof.

Alterations and addition—1928 Vallejo street, San Francisco. Architect, T. J. Welsh, Parrott Building, San Francisco. Owner George C. Boardman. Figures are now being received in the office of Architect Welsh for extensive improvements to Mr. Boardman's property on Vallejo street.

High School, Sacramento. Architect, R. A. Herold, Sacramento. The plans are ready for figures and can be seen either at Mr. Herold's or at the office of the Board of Education, Sacramento.

Chronicle Building, San Francisco. Plans are to be prepared at once for the rebuilding of the burned portion of the Chronicle Building, at Kearny and Market streets, San Francisco. It is likely that Mr. D. H. Burnham, who has charge of the building of the addition to the Chronicle Building, will supervise the plans for rebuilding the burned part.

Business block, Auburn, Cal. Architect Patterson Ross, San Francisco. Cost $8,000. Plans are now being prepared for this building, which will be two stories and contain stores on the ground floor and a lodging house upstairs.

Reinforced concrete residence, Berkeley. Architect, William Knowles, San Francisco. Cost $20,000. Name of owner withheld for present. Mr. Knowles is at work on plans for this house, which will be built on the Mexican style of architecture, with a flat roof and roof garden. Mr. Knowles is also working on an apartment house for Berkeley, which will be treated in the same way.

Three story and basement building, San Francisco. Architect, Nathaniel Blaisdell, 222 Sansome street, San Francisco. Owner, George W. Hind, 302 California street. Cost, $40,000. The contract for the erection of this building has just been let to J. C. Caldwell.

Bank Building. Architects, Meyer & O'Brien. Owner, Humboldt Savings Bank. The revised plans for the Humboldt Bank Building are now being finished. They call for a ten-story steel, brick and stone structure to cost in the vicinity of $125,000.

Residence, Baker and Green streets, San Francisco. Owner, Col. A. D. Cutler, San Francisco. Cost, $10,000. Architect, M. G. Bugbee, San Francisco. Pans are now being prepared in the office of Architect Bugbee for this house, which will be colonial in style.

Library, Berkeley. Owner, State University. Cost, $700,000. Architect, John G. Howard, Italian-American Bank Building, Montgomery street, San Francisco. The Board of Regents of the State University have instructed the architect of the proposed new library building, plans for which were started some time ago and then abandoned, owing to lack of funds, to resume work on the drawings at once with a view to building the structure without further delay.

Residence, Ward street, Berkeley. Owner, Mathew Harris, San Francisco Architect, W. H. Warff, Berkeley. Cost, $3,600. The house will contain eight rooms, with natural color redwood interior finish.

Residences, Oakland. Owner, Karl H. Nickel. Cost from $2,000 to $3,500. These houses are to be built in the Linda Vista tract. Three have been started and others are contemplated.

Parochial residence, Oakland. Owner, Church of the Immaculate Conception, Jef-

ferson and Eighth streets, Oakland. Architects, Shea & Shea, San Francisco. Cost, $12,000. This house is to contain fifteen rooms and will be thoroughly modern. The general contract has just been let to J. McIntyre.

Eight-story and basement fireproof building, Kearny and Hardie place, San Francisco. Architects, Meyer & O'Brien, Crossley Building, San Francisco. Owner, Frank W. Marston. Cost, $60,000. Plans have been completed for this structure, which will be of ornamental iron, pressed brick and terra cotta. The lot is 38 by 40 feet.

Alterations and addition, north side of O'Farrell street, west of Devisadero, San Francisco. Architect, T. Patterson Ross, San Francisco Owner, Young & Swain Baking Company. The company has outgrown its present quarters, and it is proposed to build a good-sized addition costing close to $20,000.

Garage building, 227 Golden Gate avenue, San Francisco. Architect, T. Patterson Ross. Owner, Joseph Estate. Cost, $16,000. The present building will be raised and enlarged.

Flats and stores, west side of Howard street, near Fourteenth. Architect, T. Patterson Ross. Cost, $15,000. Owner, Annie T. Grundy. There will be four flats and two stores, all of which will be finished in an up-to-date manner.

Apartment house, east side of Mission street, between Twenty-second and Twenty-third streets, San Francisco. Architect, Nathaniel Blaisdell, San Francisco. Owner, George U. Hind. Cost, $50,000. The building will be a three-story frame and brick and will contain stores on the ground floor and apartments overhead. The building will have a frontage of 85 feet and a depth of 120 feet.

Apartments, southwest corner of Hyde and Pacific streets, San Francisco. Owner, D. Redmond Payne. Cost, $30,000. This building will be four stories and will contain apartments and stores. J. Wilkin is to build a flat building on the east side of Baker street, south of Hayes, to cost $18,000.

Hotel and office building, Berkeley. Owner, John H. Spring, president of Spring Construction Company. Cost, $35,000. Mr. Spring has just purchased the lot at Adeline and Alcatraz avenue, and plans will be drawn at once for a modern brick building for hotel and office purposes.

Elks Building, Stockton. The Elks have decided to put up a new building to cost $100,000, and have called for competitive plans which must reach John Doyle, Secretary of the Building Committee, by December 6. Building is to be 100 by 100 feet, three or four stories, of brick and stone, elevators, etc.

Bank building, California and Sansome streets, San Francisco. Architects, Bliss & Faville, Crocker Building, San Francisco. Cost, $100,000 Owner, Bank of California. The entire building will be occupied by the bank. Corinthian columns, California granite, marble interior, elaborate fixtures, etc.

Additions and improvements to Sanitarium, Race street, San Jose. Architects, Theo. Lenzen & Son, San Jose. Cost, $30,000. Owners, Mr. and Mrs. O'Connor. Improvements include new heating and ventilating plant of most improved pattern, capable of heating 700,000 cubic feet.

Warehouse, Front and Battery streets, San Francisco. Architects, Wright & Polk, San Francisco. Owner, W. P. Fuller Co. Cost, $50,000. This building is to be of heavy steel construction. There will be monumental arcades on the front filled in with fireproof wire. Plate glass set in metal frames. Bids are now being taken.

Three-story brick building, Aberdene, Wash. Architect, C. M. Cook, Oakland. Cost, $100.000. Owner, Name withheld for present. The building will be of brick and steel, three stories, offices and stores.

Residence, San Mateo. Architect, C. M. Cook, Broadway, Oakland. Cost, $6,000. Owner, W. T. Phillips. The house will contain eight rooms.

Masonic Temple, San Jose. The various Masonic lodges of San Jose are to erect a temple at the corner of South First and San Carlos streets to cost about $20,000. No plans have been prepared as yet.

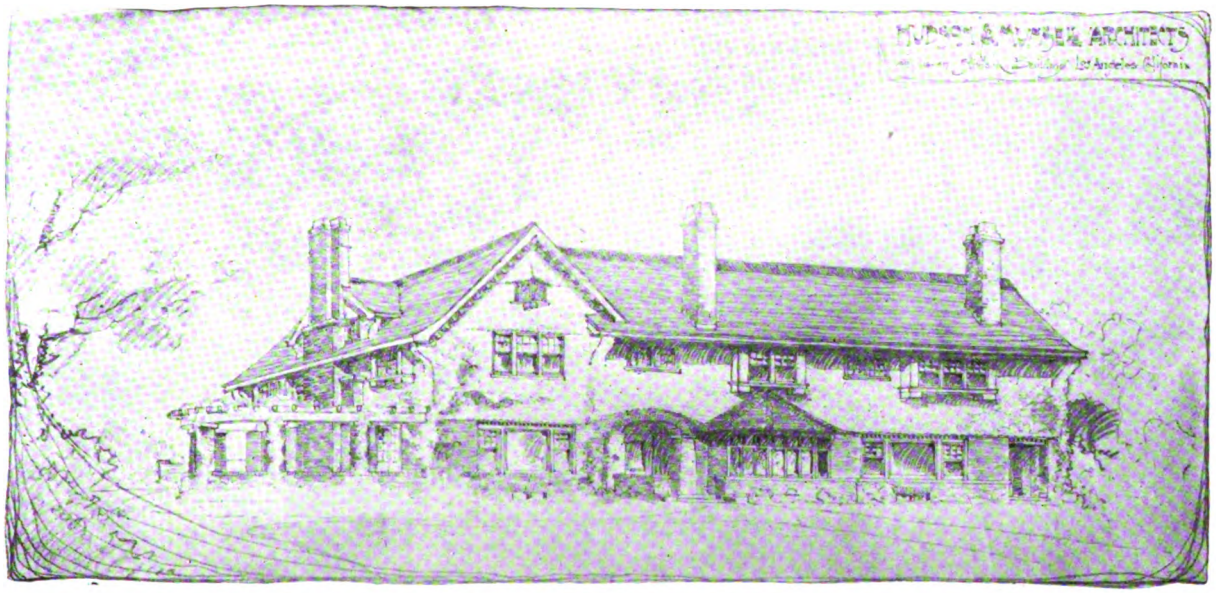
Church, San Francisco. Architect, T. J. Welsh, Parrott Building, San Francisco. Owner, Church of St. Agnes. Plans are now being prepared. For further information see architect, or pastor of St. Agnes' Church.

High School, Sacramento. Cost, $150,000. The Board of Education has just authorized the erection of a new High School building, for which plans are to be prepared at once. For information address Chairman of Board or Superintendent of Schools.

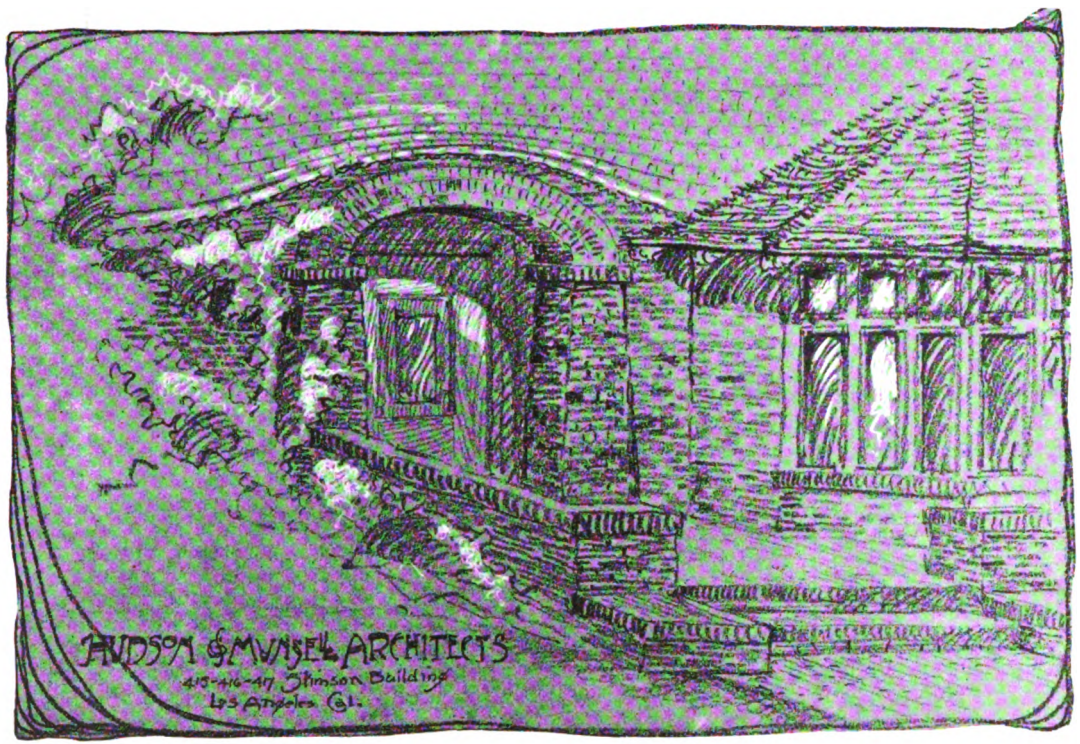
Residence, Pacific avenue, San Francisco. Architects, Bliss & Faville. Cost, $40,000. Owner, John D. Spreckels. The contract for the erection of a fine home has just been let to G. H. Walker, of San Francisco.

Bank alterations and improvements. Corner Montgomery and Sacramento streets, San Francisco. Architect, D. Franklin Oliver. Cost, $8,000. Owner, Pacific Mutual Insurance Company. Bids for these improvements are now being taken at Mr. Oliver's office, in the new James Flood Building.

Addition to college, San Jose. Architects, Theodore Lenzen & Son, San Jose. Cost, $30,000. Owner, College of Notre Dame. The building is to be 70 by 88 feet, brick, two stories, granite steps, cement columns, tin roof, etc.



Exterior View of Captain C. E. Thom's Residence, Los Angeles *Hudson & Munsell, Architects* C-279



Detail Sketch, Showing Entrance to Capt. C. E. Thom's Residence, Los Angeles *Hudson & Munsell, Architects* C-280

THE

Architect and Engineer

OF CALIFORNIA

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EDITORIAL

UNCLE SAM FOR ART

Uncle Sam is fast dispelling the imputation that America has little appreciation of art as an embellishment of public buildings. We have an instance right here in California in the beautiful new postoffice building. In New York the tendency of the government to encourage things artistic is seen in the new custom house now under construction. The style of the building is modern French Renaissance, which permits elaborate treatment. This the architect, Mr. Cass Gilbert, has taken advantage of and has commissioned notable sculptors of this country and Europe to execute the groups or figures consistent with the objects to be allegorically represented These sculptured designs are largely external ornamentation, which will greatly add to the architectural effect. Four of these are continental groups, picturing the four land divisions of the globe, and twelve figures, typical of the great nations of the earth. Each of these latter is characteristic of the people it represents, and even in the carving on the lintels of the windows the racial types are indicated.

♣ ♣ ♣

ORDINANCE NEEDED

At the recent annual convention of the Massachusetts State Firemen's Association, William T. Cheswell, Chief of the Boston Fire Department, read a paper on the danger to life from fires occurring in crowded stores. In addition to well-known recommendations relating to limitation of space betweeen fire-walls, brick-enclosed staircases and fireproof elevator shafts, Mr. Cheswell lays particular stress on the planning and placing of stairways in the positions that they would most naturally be expected to be found, and the importance of the fact that the foot of one flight should conduct naturally to the head of the next lower one. He also condemns the use of the revolving door and calls attention to the fact that storekeepers, who wish to display large stocks, do

not provide in the passages between counters and showcases a sufficient and reasonable amount of space. We agree with a contemporary that here is a matter which should be regulated by ordinance, even though it would in a manner interfere with individual liberty of action and the right of use of private property. These great modern temples of trade should be in every detail as much subject to public control as are theatres, factories and churches.

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CONCRETE SIDEWALKS

The concrete sidewalk is no longer an uncertainty from the standpoints of permanence and durability. Modern methods have been used advantageously in making a concrete mixture that will not crumble, crack or warp. The concrete sidewalk has been in existence for nearly a quarter century, but it is only recently that the perfect cement walk has appeared. The use of Portland cement has demonstrated that it is by far the best material for sidewalk purposes. Experiments made recently with concrete and natural stone sidewalks have shown the former to outclass the latter both in regard to durability and in the power to resist moisture.

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A CLASSIC BANK BUILDING

We have heard some exceedingly beauty of design of the new building for the Bank of California, by the well-known firm of architects, Messrs. Bliss & Faville. A handsome perspective of the building, which is to adorn the corner of Sansome and California streets, was shown in the November number of the Architect and Engineer.

The design is classic. An exchange comments that it is to be the most notable building to be erected in San Francisco in 1906. It may be interesting to our readers to know that many details of the structure are taken from ruins in the Roman Forum. The columns, for instance, are patterned closely after those of the Temple of Jupiter Stator, and are fifty feet in height.

The architectural scheme is that of a colonnade of Corinthian columns, between which are screens of bronze grilles and glass to admit light. California granite is the material chosen for the work. The interior will be of grand proportions, one large banking room covering the entire building lot and reaching to a height of fifty feet. Pilasters on the sides of this room will support an ornamental ceiling, and the general effect will be the same as for the exterior. The interior finish will be of marble and mahogany throughout the building. Above the banking room, but concealed by the balustrade, will be two rows of offices for the officials of the various departments connected with the bank. These will be reached both by an electric elevator and by a staircase. Modern furniture of the best designs will be installed, harmonizing with the rich yet sober decorations.

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THE WRECKING OF A WORLD'S FAIR.

The work of demolishing the splendid buildings at the Louisiana Purchase Exposition is a colossal task, as indicated by the amount of material collected by the company which purchased the structures from the fair management. In a list sent out to prospective purchasers of the material no less than 100,000,000 feet of lumber is offered for sale, comprising every kind and description, 50,000 sash, 10,000 doors, together with one million dollars' worth of copper wire and other electrical material, vast quantities of pipe, fencing, roofing material, furniture, in fact, an aggregation of second-hand goods such as never before was placed on the market. A novel feature is the offering of 25,000 bamboo poles used by the government in the Philippine Reservation, the last memento of the man-eating natives of Uncle Sam's new possession.

The Publisher's Corner

PACIFIC COAST LUMBER & MILL CO.

The desire to modernize and systematize business methods is uppermost in all business men's minds. Foremost with these ideas will be found the Pacific Coast Lumber & Mill Company, located at the corner of Second and Grove streets, Oakland, and incorporated with a capital of $50,000. A. Kendall is the president and general manager; C. G. Bird, secretary; J. A. Park, treasurer, and A. J. Patterson, manager of lumber department.

This company was first established by Mr. A. Kendall on July 21, 1880, with a capital of about $300 and a plant consisting of one small building occupying in all about six building lots, and operating two stickers, one planer, one band saw, one jig saw and one or two other small machines.

Twelve years later, July 1, 1892, this concern was capitalized for $50,000. Extensive improvements were made from time to time until today the plant and yards cover an area of three or four city blocks, carrying a stock of Redwood, Oregon pine, California Sugar and Mountain pine, White Cedar, Curly Redwood, Oak, Maple and other hard woods, amounting to over five million feet, and having a floor space in its mill of over 50,000 square feet, employing on an average of 130 men, with a weekly pay roll of over $2300.

Steam power is used throughout except for lighting, electric lights being extensively used. Steam jets and hydraulic fire extinguishers are well distributed as a protection against fire. The company has a perfect blower system for the collection of all sawdust and shavings, which are carried direct to the fire pit. This company has a great advantage over other woodworking plants insomuch as it is able to furnish everything from all kinds of rough construction timbers to the very finest interior finishing for any building complete.

The company is heavily interested in extensive forests and mills in Humboldt coun-

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Of California

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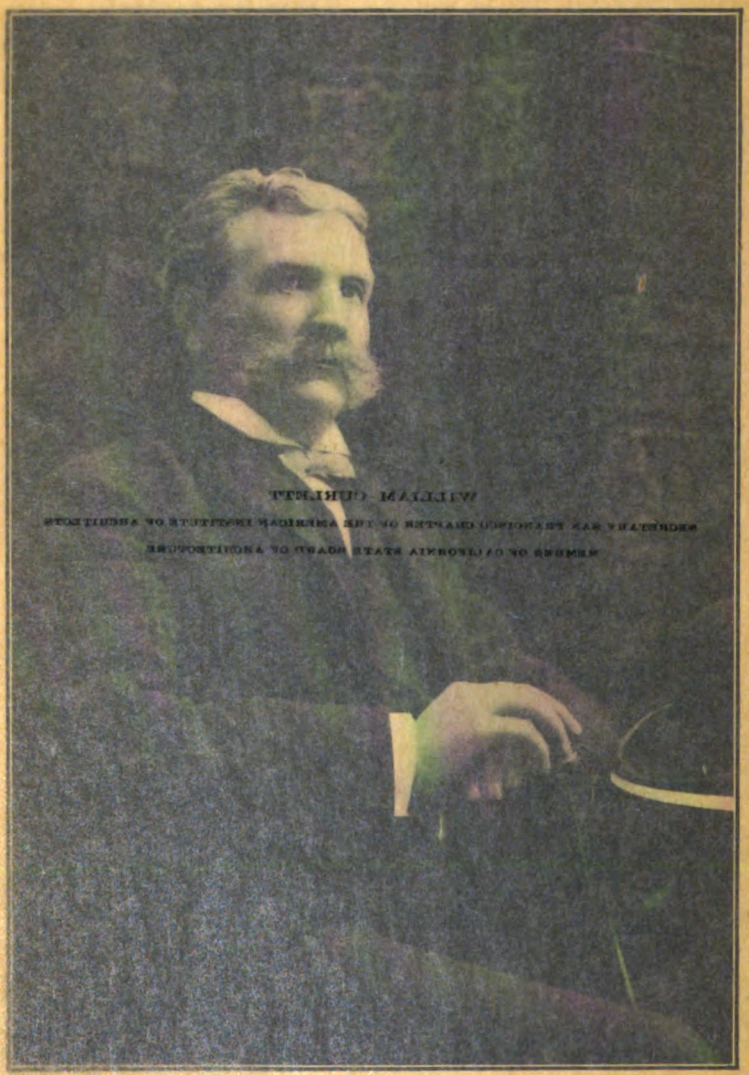
Contents for January

WILLIAM CURLETT
SECRETARY SAN FRANCISCO CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS
MEMBER OF CALIFORNIA STATE BOARD OF ARCHITECTURE



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Hotel Saint Marks, Venice.
Photos by Graham, Los Angeles.

Marsh & Graham, Architects. **C-29k**

The Architect and Engineer
Of California

VOL. III JANUARY, 1906. NO. 3

Venice of America

By NORMAN F. MARSH, B. S.

EW moons have passed since the cries of the gull and bittern were familiar sounds to the sand dunes and waste places of what is now a magic city.

Seldom have ideals been conceived and wrought into the real in such a short period of time.

Like the Aladdin's lamp of nursery days, wealth and labor have been the wand that has transformed an uninviting landscape in the southern part of California into scenes that delight the aesthetic. To the Founder of Venice, Abbot Kinney, great praise is due that he had the courage to attempt that which to the ordinary mind would seem like a fanciful dream; and yet inspirations are like dreams that seldom shape themselves in realities.

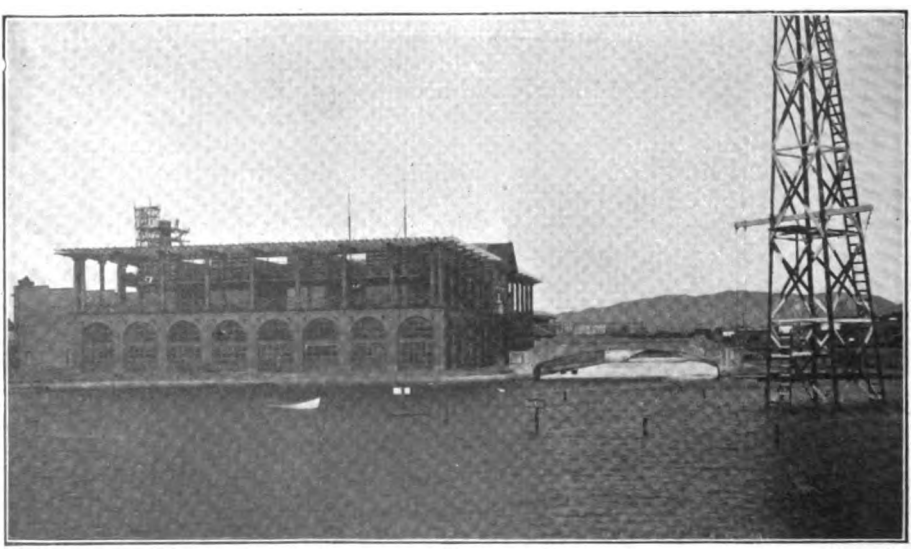
Venice might properly be divided into three sections. The Pier section, which juts into the sea some eight hundred feet, terminating in a granite breakwater. The Arcaded Streets and the Grand Basin, or canal section, around which are grouped the residences.

The entrance to the pier at the sea end of the Arcade Street is flanked by the large Oriental and Foreign Exhibit building, where costly and beautiful wares are to be seen.

Midway to the left, as you go onto the pier, is the good Ship Cabrillo, named in honor of the intrepid explorer who discovered the great Pacific. Built along the quaint line of an old Spanish ship it presents an interesting and unique structure. One may dine on its decks or in its salons and feel the charm of nautical surroundings and scenes, free from all discomfort. The ship is one hundred and eighty-two feet from stem to stern and fifty-two feet beam. The three masts are tall trees from the great forests of Oregon. Rigged with fighting tops, ladders and the equipment of an old Spanish mistress of the seas, it makes an attractive bit of marine architecture of other days.

Just beyond the Ship Hotel, some distance farther out, stands the great Auditorium, one of the most imposing structures of the magic city. This large structure, capable of seating 4,000 people, with ample stage and dressing rooms, was erected in the record time of just twenty-eight days. The acoustics of this building are very sensitive, and the most delicate notes of the

Windward Avenue (Arcade Street), Venice. *Marsh & Russell, Architects.* C-292



Bathing Pavilion, Venice *Marsh & Russell, Architects.* C-293

violin can be heard with ease at the remotest points. In the wings of the stage, hid from view, is a magnificent pipe organ, and when played the music seems to be floating all about you. With careful lighting and a soft color scheme this is a delightful place to hear a fine concert, a masterly oration or an interesting play. In this building is located the Palm Garden, where one may go to refresh the inner man and listen to dulcet strains from master hands.

Coming off of the pier one is impressed with the Hotel Saint Marks, standing on the corner of Ocean front and Windward Avenue, a hostelry of some seventy-five rooms with its large inner court and salt water baths. It is an attractive headquarters for tourists and sojourners at Venice. Next to the Saint Marks is Hotel Windward, an interesting and typical building of the far-famed Venice of the Adriatic.

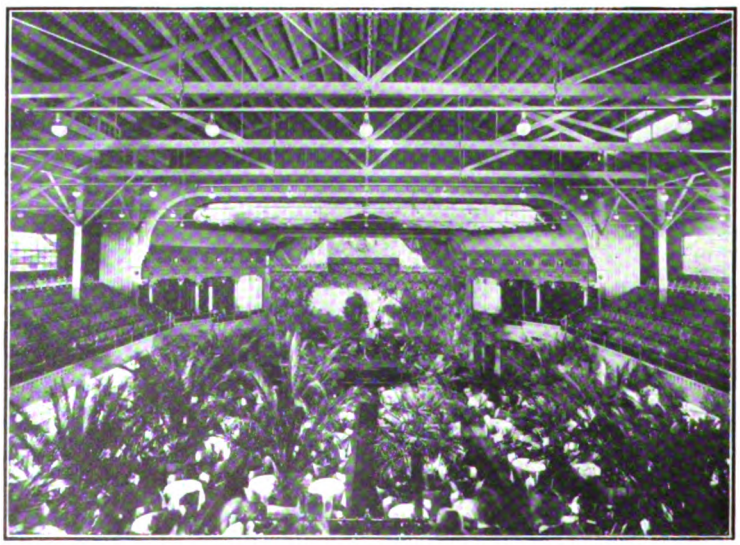
Windward Avenue, the Arcade Street, is composed of substantial buildings of brick and steel with concrete foundations. The second story comes to the curb line and is carried by massive columns (gems of the moulder's art), the ceilings being groined, forming vaulted corridors, a picture that delights the eye of the artist.

The Bank of Venice, which occupies a prominent corner, is an attractive structure with Venetian lines. The Arcade Street is the busy mart of this magic city.

Venice has two bath houses—the Surf bath, built on the sand for those who love to sport in the waves and enjoy a stroll in the spent breakers, and the great bathing Palace, with its plunge, promenades and numerous dressing rooms, located on the great inner lake, the hub of the canal system. Its classic lines find a faithful mirror in the placid waters which surround it.

Colonnade, Venice. *Marsh & Russell, Architects.* C 294

Venice. *Marsh & Russell, Architects.* C-295



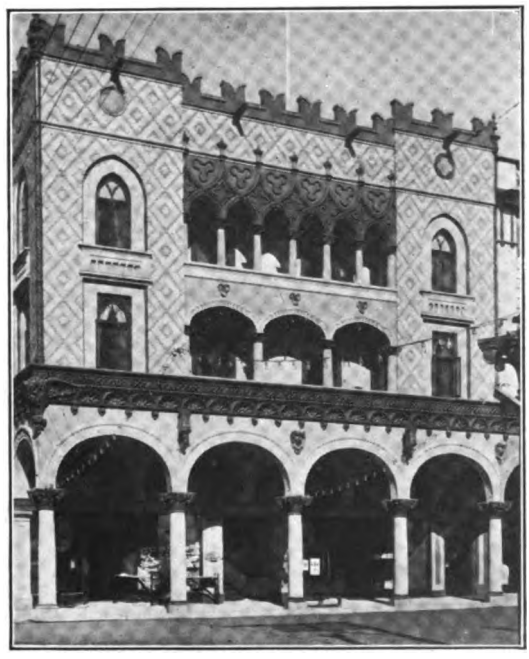
Palm Gardens, Venice. *Marsh & Russell, Architects.* C-296

At the end of Windward Avenue, overlooking the grand basin and the bathing lake, stands the Amphitheatre floating the pennants of many nations. This is so arranged that the great crowds which gather there can have full view of the aquatic sports, and in the summer evenings often gather for twilight concerts and to watch the gondolas glide over the waters, shimmering in the glow of myriads of electric lamps. Venice at night is a glow of light, which transforms the outlines of its main buildings into rims of fire.

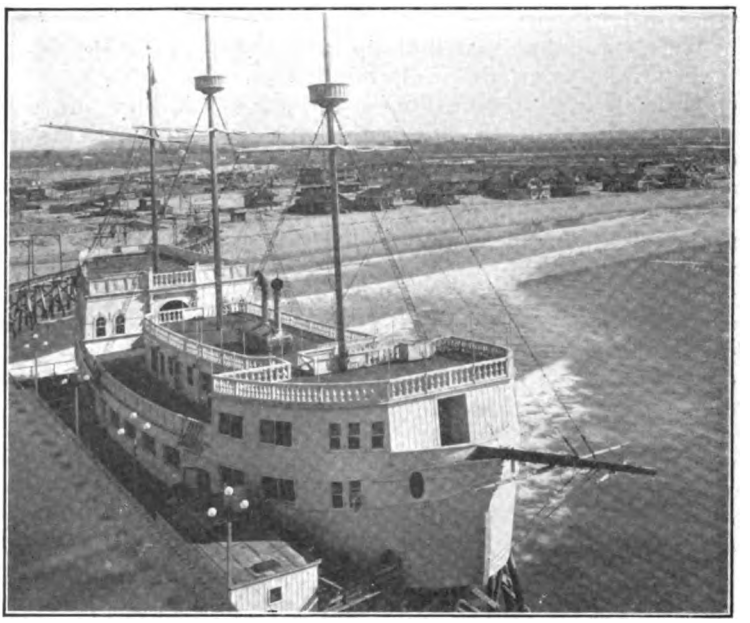
Hard by the Amphitheatre is the Midway Plaisance with its interesting little buildings. From the Temple of Mirth to the stately minarets which pierce the sky, one may find great variety in this collection of unique structures. This is the playground of Venice, and here the throngs gather to visit Fair Japan, the Klondyke Museum, Oriental Show or the trained animals, etc. The designer has been taxed in planning these, running the gamut from the sublime to the ridiculous.

Separated from the other buildings is the University of Arts, a picturesque and artistic little structure devoted to the arts.

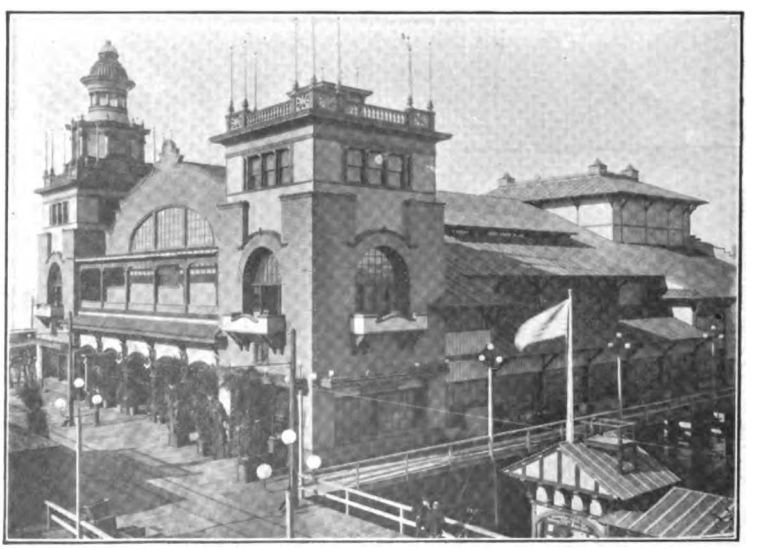
It seldom falls to the lot of a single firm of architects to design a whole city; but such has been the work of Marsh & Russell in the creation of Venice of America. How well they have met their opportunity these illustrations in a measure portray. A fuller and better understanding of the uniqueness and boldness of the enterprise can be more fully understood and appreciated by those who have looked on the magic city (built for the generations) with its stately arcades, shimmering lagoons, floating pennants and glistening minarets—such a picture as was little dreamed of a twelvemonth ago.



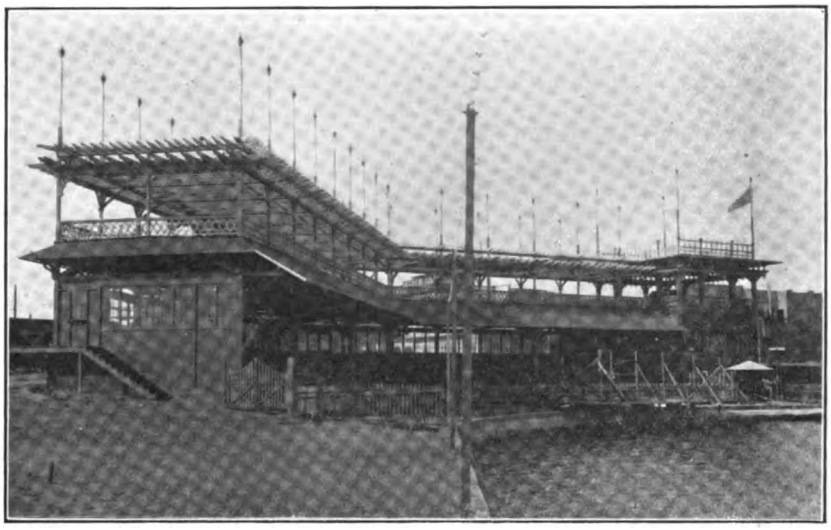
Hotel Windward, Venice. *Marsh & Russell, Architects.*
C-297



Cabrillo (Ship Hotel), Venice. *Marsh & Russell, Architects.* C-298



Auditorium, Venice. *Marsh & Russell, Architects.* C-299



Amphitheatre, Venice. *Marsh & Russell, Architects.* C-300

Some New California Bank Buildings

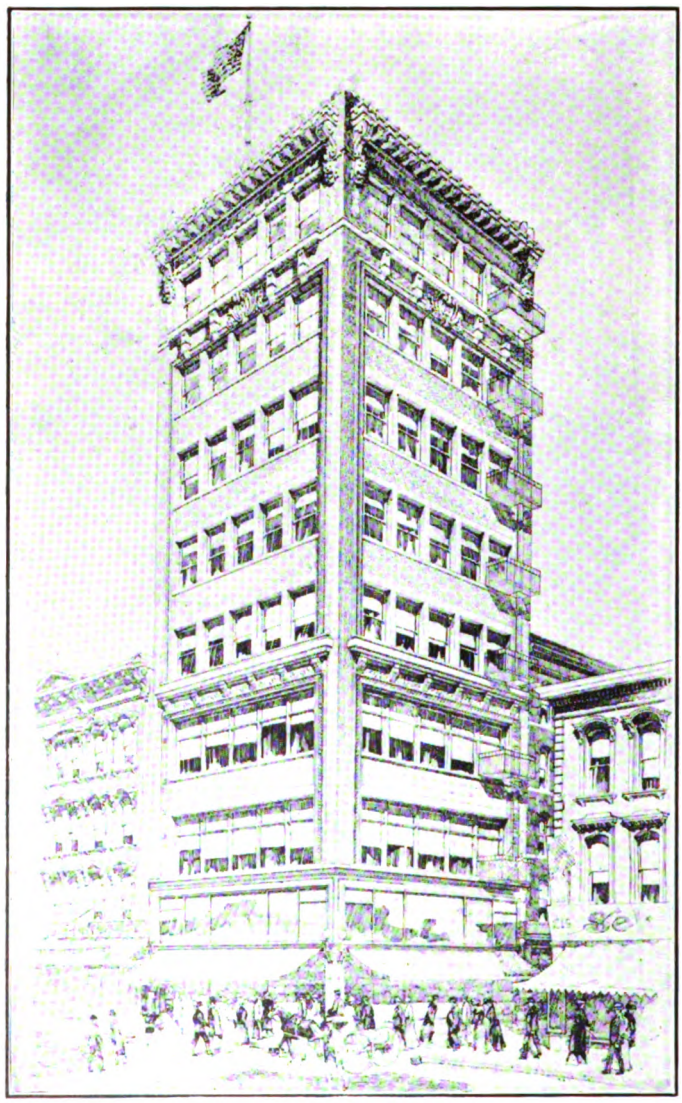
THE illustrations of bank buildings shown in this issue of the "Architect and Engineer" are from the office of Meyer & O'Brien, Crossley Building.

The buildings shown are the Columbus Savings bank and the Bank of Bakersfield. The latter is of modern French architecture now so in vogue, and consists of two stories, built of sandstone, and finished throughout in mahogany. Every convenience known has been carefully considered in the designing of this building so that for comfort and compactibility it is unexcelled.

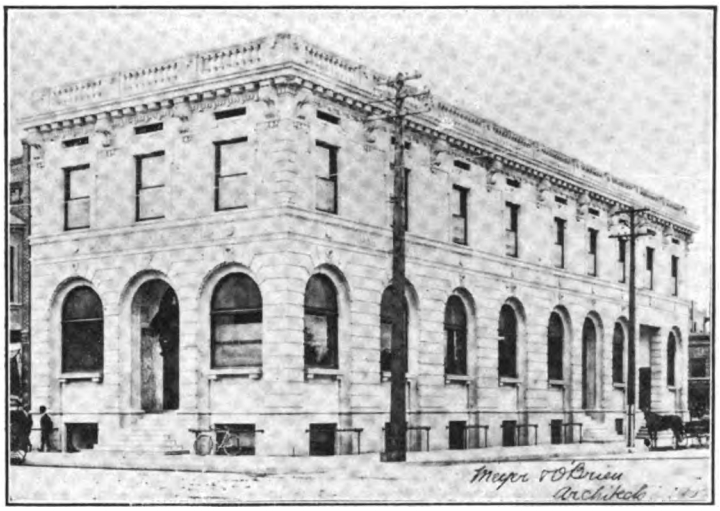
Meyer & O'Brien have distinguished themselves especially in bank buildings, the building of the new Columbus Savings bank and the remodeling of the Germania Savings bank being two of their late works. They have also completed sketches for the Bank of Woodland, situated at Woodland, Cal.

Humboldt Savings and Loan Society have secured the services of this firm of architects for the erection of their new twelve-story building, to be erected on the south side of Market street between Third and Fourth streets.

The first story of this building will be entirely of granite and the remaining stories will be of stone and cast iron. One of the features will be the large and oval arrangement of the banking counters with a public space in the center. Comfort and convenience of the attaches as well as the public have been carefully considered and planned.



Marston Building, San Francisco. *Meyer & O'Brien, Architects.* C-301
Steel Frame by Ralston Iron Works.



Bank of Bakersfield. *Meyer & O'Brien, Architects.* C-302

Columbus Savings Bank, San Francisco. *Meyer & O'Brien, Architects.* C-303

The Tevis Tomb at Cypress Lawn Cemetery. *John Galen Howard, Architect.* C-304

University of Arts, Venice. *Marsh & Russell, Architects.* C-305

Artificial Lighting Instruments of Various Periods

By CARL E. ROESCH

THE flickering light from a burning log sufficed for our earliest ancestors. Came then a torch of pine, and later a rush dipped in tallow—the candle. In Egypt the lamp was born, thence carried into Greece, and to the Goddess of Learning, Minerva, was consecrated. Into Rome it soon found its way, where vessels of bronze with richly adorned silver inlays served to illumine the dwellings. In religious worship, too, the lamp was a feature, while those known as Everlasting Lights guarded well the tombs of the ancient dead, the burning lamp signifying the immortality of the soul.

The Candle! The Lamp! Primitive? Perhaps! But while the age in which we live demands a more convenient mode of illumination, they must ever represent to us the classic, the beautiful.

Prior to the advent of oil, the tallow candle was deemed quite a satisfactory illuminant, the manufacture of which is familiar to our grandfathers, who can recall the wooden forms in which the glowing tallow was poured. No early colonial home was complete without its candle mould. The beauty of the old colonial and Flemish candlesticks is so thoroughly appreciated that in the present day they are often adopted after being provided with the more convenient electrical connections and serve the two-fold purpose of decoration and utility.

This mode of lighting gave way to the more brilliant kerosene lamp, which has not been entirely supplanted at this date, being given preference in many homes over the more modern forms of lighting, particularly as reading lamps, due to the mellow quality of the light, considered by many who spend much time in reading by artificial light to be the least trying on the eyes.

In the year 1792, on the nineteenth of September, Mr. William Murdock, of Cornwall, England, invited a few friends to spend the evening at his house in Redruth, promising them, as one of the evening's diversions, something a little out of the ordinary. There was no hint as to what it was, but an invitation from the great scientist was not to be treated lightly, as it meant an enjoyable as well as an edifying evening.

When all had assembled he placed a sheep's bladder, apparently filled with air, upon the table and pricked it with a knife; still none of his guests suspected what was coming. When, however, he applied a lighted candle to the aperture and a bluish-yellow flame issued therefrom, Mr. Murdock had unwittingly made use of the first gas fixture known in history.

Such a fixture was hardly destined to serve any practical purpose other than to present Mr. Murdock's claims to the world as the discoverer of illuminating gas; but it was not long before he had placed metal pipes in his house, leading from his colliery near by, fitted them with at least serviceable, if not

artistic, terminals and enjoyed the distinction of being the first to use gas for illumination. Shortly afterward a company was formed in which were interested Mr. Bolton and Mr. Watt, two other prominent men of the day, and gas was finally supplied to light not only houses, but the streets of London and other large cities in England. The fixtures at this time consisted of small metal tubes with conical ends having three tiny perforations, from which issued three little jets of flame rather in the shape of a fleur-de-lis.

When the Amiens Treaty of Peace was signed by England and France, in 1802, it gave Mr. Murdock an opportunity to show his patriotic pleasure and incidentally to advertise in a practical way to the masses what his new discovery would do. Near his colliery in Birmingham he erected an enormous arch made of gaspipes pierced with numerous little openings, some of which formed the letters of an appropriate legend, while the rest extended high into the air in the form of a triumphal arch. Mr. Murdock saw to it that there was a plentiful supply of gas turned into these pipes at the proper time, and the lighting of the arch was a ceremony long to be remembered. The entire population of Birmingham turned out to see the wonderful sight, and it was a nine-days' wonder, not only in Birmingham, but throughout England as well. The demand immediately thereafter for this new means of illumination became so great that companies were started all through England, under the parent company at Birmingham, and Mr. Murdock was ultimately well repaid for his patriotic enthusiasm.

In America illuminating gas was first used by Mr. David Mellville, at Newport, R. I., in the year 1806. It was afterward adopted by other wealthy men of the day, and in a short time came to be generally recognized as an important factor in domestic economy and comfort.

The instruments used for lighting were at first plain iron pipes, such as were used for conducting the gas from the mains. Later on it occurred to a few enterprising minds that these pipes could be hidden by means of applied decoration, and all sorts of metal leaves, flower forms, fruit and even heads and figures were used for this purpose. This continued until the fact was recognized that not only could the pipes be hidden by decoration, but that the pipes themselves could be made to assume artistic forms. Then followed examples of the brass-moulder's craft, which were finished and artistic productions, and to this day represent the best that can be produced in this branch of artisanship.

From this point, the next radical change was the forward movement and impetus given to all methods of lighting by the advent of the electric light. This was truly the beginning of a renascent epoch in fixture designing, as the wonderful possibilities of the new light were recognized almost immediately. The rapid strides taken in the perfection of the marvelous little bulb, both in its mechanical improvement and the embellishment of the devices for its practical application are fresh in the minds of most of us. Here was a light which would burn when placed at any angle or position, and those interested soon availed themselves of this fact, and the beautiful lighting fixtures of the present day are the result.

While the pleasure and satisfaction of an open log fire is unequaled from an aesthetic point of view by any modern method of lighting, the demands of the present day and age preclude the possibility of our depending to any great degree upon such primitive methods. We therefore are compelled to resort to the more practical if less poetic lighting appliances, and thanks to the ingenuity of designers now engaged in this work we need not necessarily surround ourselves with inartistic creations, the truth of this being borne out by the evidence on every hand of most beautiful adaptations from the recognized standards of decorative art. This is particularly true when the designer returns to the use of wood which he carves into various suggestions of Italian motives and then gilds, some of our craftsmen being sufficiently proficient in this art to obtain antique colorings which are hardly distinguishable from the genuine. Examples of this work are to be seen in some of the better shops. The writer recalls particularly a pair of carved wood standards beautifully executed, the Italian detail offering excellent opportunity for gilded embellishment. These standards were intended to aid in the lighting of a staircase hall, where carved wood wall brackets of similar design and treatment formed the principal scheme of lighting.

A rather striking departure is the discovery of the artistic possibilities of mica and its embodiment in various forms of light fixtures. It is especially appropriate as a substitute for art glass, lending itself readily to the more refined types, inasmuch as it is possible to give it certain color effects, and thereby preserving the harmony of the room treatment.

The effort being made at this time to have the useful and necessary surroundings of our daily life beautiful than to waste that energy and creative ability in useless bits of bric-a-brac is apparent in the application of electric light to candlesticks, lamps and such other more or less necessary articles of utility and decoration with which we surround ourselves.

Atmosphere, beauty and color have now been found to be at one with utility, although much thought and study is required to avoid the pitfalls of either extreme and to bring perfect harmony between utility and beauty.

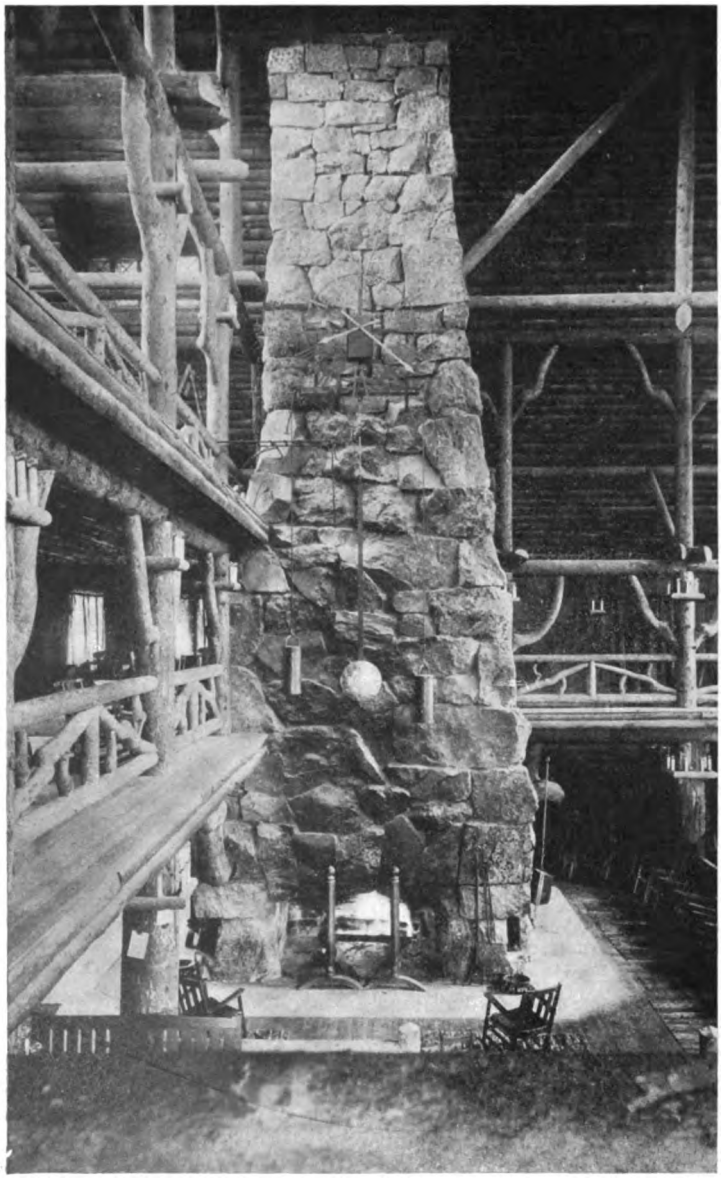
* * *

A School of Architecture

A NATIONAL school of architecture will be founded in New York by the members of the Society of Beaux Arts Architects. It will seek to develop a distinctive American style, and it will bring opportunities for study to the four thousand draughtsmen in New York, many of whom are ambitious to enter the profession of architects, and are studying to that end under conditions not as favorable as they might be. There are at present several centres of practical teaching in New York, conducted under the general guidance of the education committee of the Society of Beaux Arts Architects. William Warren, president of the society, will appoint a committee of five architects, however, who will see what can be done toward the foundation of a central and national school.

William Warren is quoted as explaining the plan as follows:

"Our system reaches an entirely different element from other institutions. The great unfortunate feature of other systems is that they create an elite, which, among art students, cannot exist. If these two elements—that of those who can devote all their time to study, and the draughtsmen, who, until the appearance of this society, were absolutely ignored—could be brought closely together, the incentive to both would be great and the benefit to our art likewise."



Rustic Interior in Office of Old Faithful Inn, Yellowstone Park C 306

Rustic Architecture

By A. W. SMITH, Architect

UNDER this head should properly be embraced everything other than strictly city dwellings and business structures. In this line of architecture there is much room for improvement. The average suburbanite frequently gets his plan from a combination architect and builder who is generally a failure architecturally if not as a builder, or else he demands a plan which invariably is a copy, exact or nearly so, of some strictly city building.

There is, however, a growing sentiment in favor of a class of strictly rustic work and for the benefit of the commuter and his architect (?) and builder a few general directions are herewith outlined.

First, no matter how small or inexpensive a house may be, it should be made an ornament to the landscape, remember, keeping in mind the maxim that "ugliness is a crime."

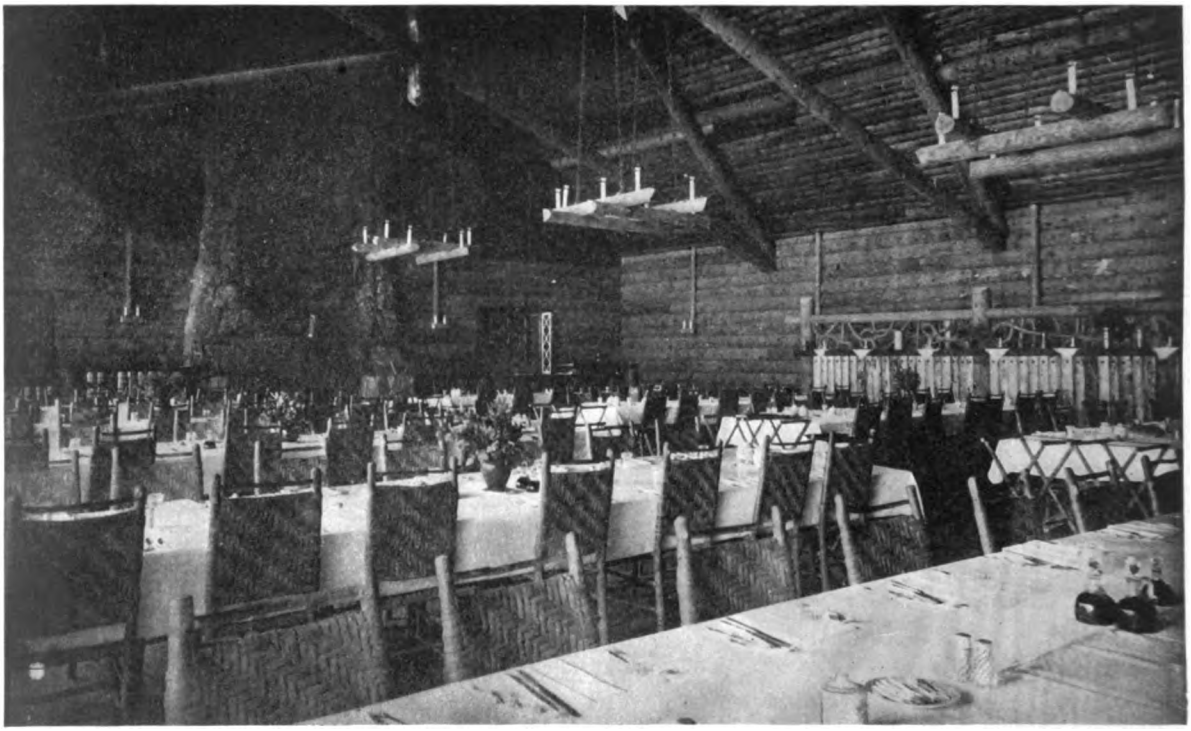
The main features of this new school of design are truth and simplicity. No ornament whatever is applied that is simply ornamental and that has not some constructive value that demands its existence. Simplicity is an essential. No complicated structural devices are a necessity in any ordinary structure.

The exterior wall covering should be shingled, shakes, or rough clapboards—the two former need no painting and the latter should be given two coats of a good shingle stain. All window casings and mouldings should be as far as possible of rough stuff sawed to shape and with the "moulding" idea as far removed as possible. All roofs should have wide projecting eaves, the roof construction should be evident and should be fairly heavy. This means what is called a "rake" cornice which is vastly more appropriate than a "level" cornice where the plancier is put on level and finished with a gutter. The roof should be constructed with as few breaks as possible. Every hip and valley added to it only increases the expense and adds another possibility of a leak. Finish the eaves by omitting the inevitable wood gutter and if a gutter is necessary build in a metal gutter on the roof a foot or so above the ends of rafters. Leave the rafter ends plain, don't cut them into fantastic and outlandish shapes.

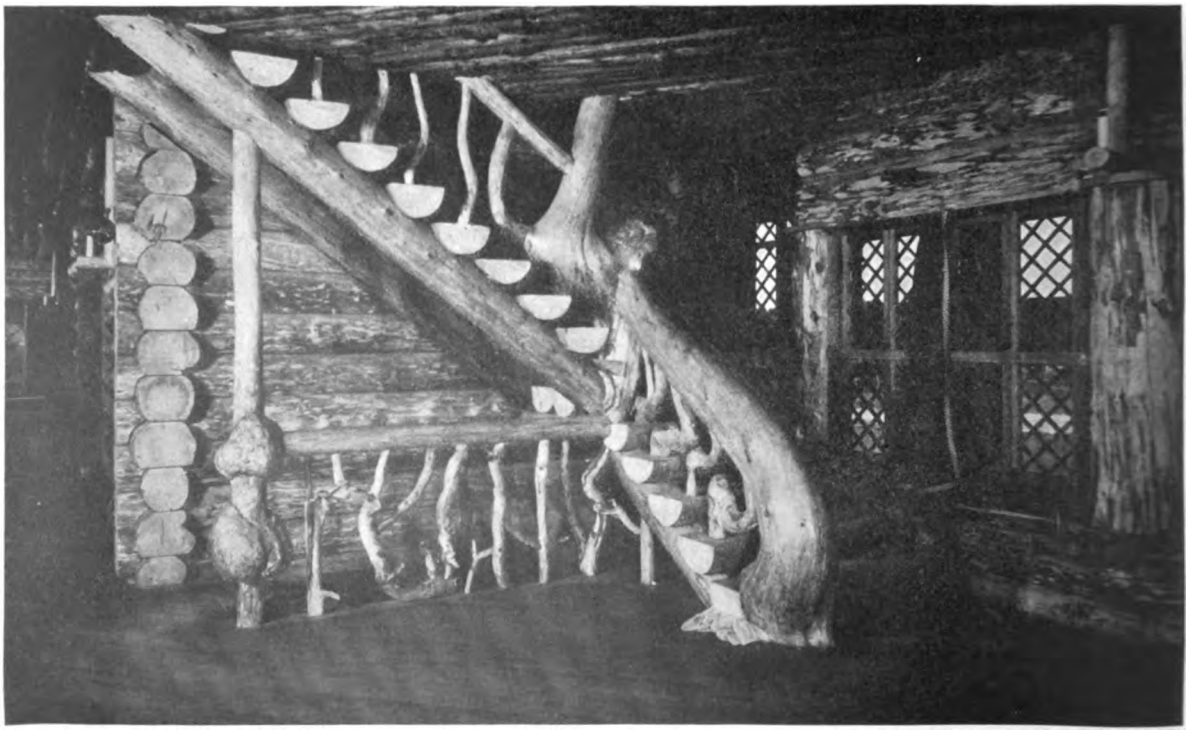
Build flower boxes and potted plant shelves wherever they will be of use but don't ever put them under a high sash or any other inaccessible place. Make your porches wide and generous—make your porch columns of plain square sawed stuff and make the frieze over them of a heavy plain square timber. If this needs braces, put them on, but don't put on imitation dowel pins and imitation tenon ends. If you really mortise this stuff together then let it show but don't sham. Finish your gables, if you have any, with the same exposed timbering as you have indicated for the roof, but don't build a great heavy gable end with hammer beam trusses, or purloin and truss effect unless your roof is so constructed throughout.

Make your windows wide and not high and put in plenty of them—it is generally a good idea to make an entire end of a dining or living room of windows, and two windows four feet wide are not too much for an ordinary bedroom. Hinge your windows wherever practicable to do so—and use leaded glass or wood bars to make them in small lights and in so doing avoid fantastic designs of lead and wood and confine yourself to diamond shape and square lights.

If your porch comes where a wide porch roof would cut off sunshine or light then leave the roof covering off and make of it a pergola effect, this



Dining Room, Rustic Interior C-281



Rustic Stairway C-282

will not cut off your desired sun rays when you want them and you can have a rolling canvas cover, that can be arranged to roll down on your rafters to give shade when wanted. Make your porch railings simple in design. If you are near a much traveled street or road make your railing a solid buttress, wide and low, it will create an idea of privacy and a wide rail makes an excellent shelf for plants. If an open-work rail is appropriate or desirable then use a heavy square rail and plain square balusters all of rough stuff so that it will be an efficient guard against a possible fall of your balcony and yet not convey the idea that it was put there to exhibit samples of the skill of some member of the wood-turners' union.

When you build your outside steps don't use the usual one and a quarter inch stepping, it is thin and lacks the appearance of strength and rigidity. Use instead, three by fourteen inches rough stuff, with the front edges just chamfered. This will last longer, won't need painting as much and will warp but very little and you won't have cup-shaped steps holding water in them after every rain.

Make your garden walks of red brick—their surface has texture and color which are missing in cement and their color harmonizes with your lawn and garden while the cold smooth even gray surface of a concrete walk never harmonizes with anything. If your lot is above grade make the steps thereto also of brick, they also look better than the usual concrete steps and you never slip on a brick footing.

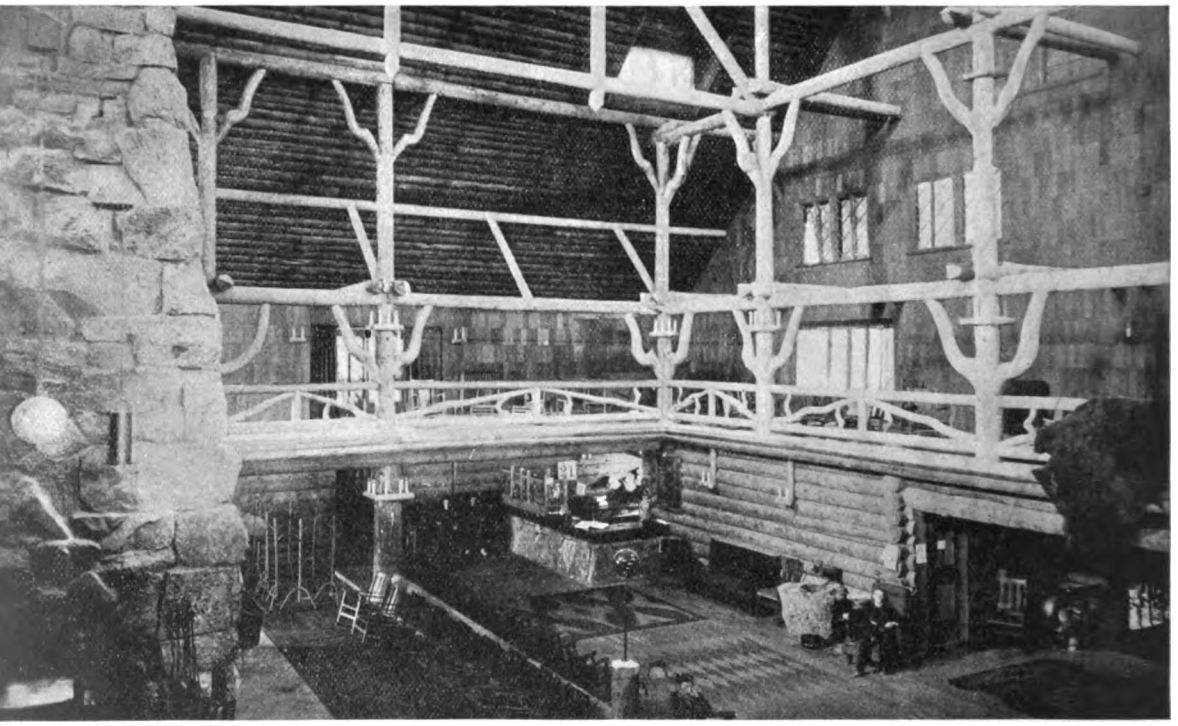
Your doors, outside doors anyway, should be thick. The average outside door is one and three quarters inches thick and any burglariously inclined gentlemen can open one with a hard shove of his shoulder. The doors should be plain and made to fit the occasion. Should light be so necessary in your hall, that glass must go in your door then use one large single panel of plate glass and get this glass one inch thick, it costs a little more but a man will have to use a sledge-hammer to break it.

Don't use any paint whatever on the outside of your home. Stain everything with some good shingle stain. Stain your cornices and trimmings in a different color from your main walls and stain your roof some light green. Don't try to stain your roof so dark that it looks like slate—it won't fool anybody and it won't look nearly as good as slate.

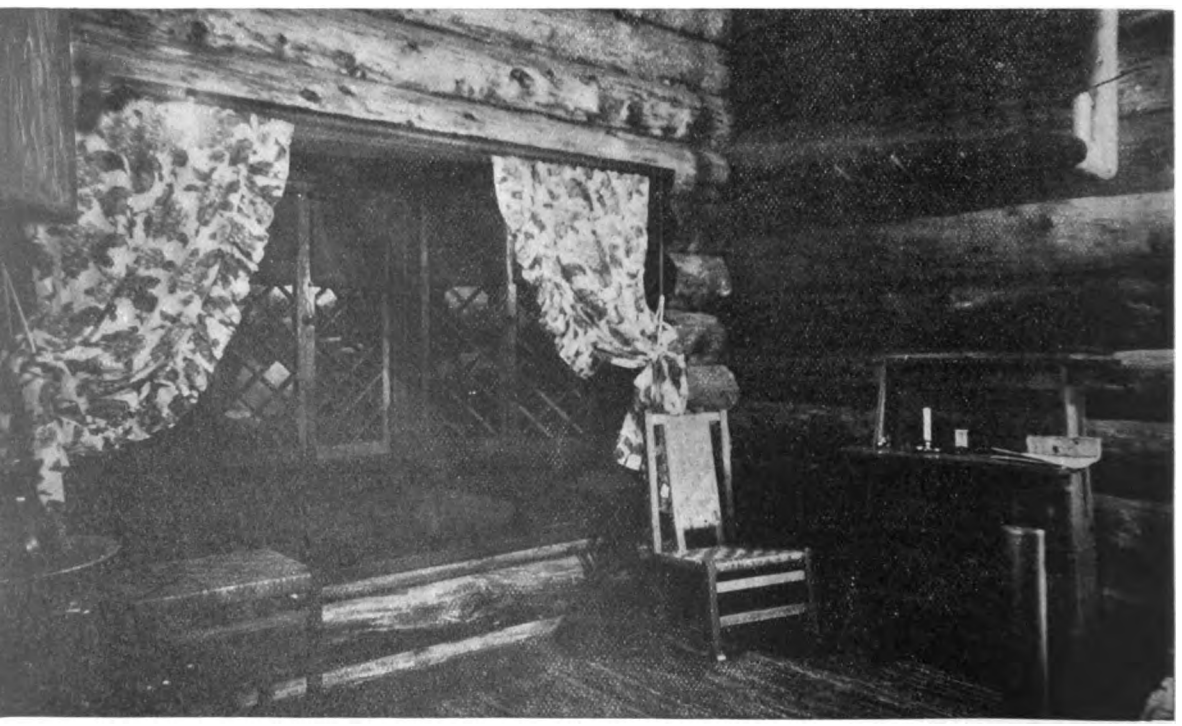
Carry your chimneys up at least three feet above the highest point of your roof and build them of the roughest brick you can get and don't let your bricklayer make too nice and smooth a job of laying them. If any of the chimneys project so high that a brace is needful, have a heavy strong iron brace made, not a light fanciful scroll work affair such as is ordinarily used.

If you follow these few general ideas you will create a building that will blend harmoniously with its surroundings and that will appear "at home." You will not find its construction expensive, as the rough lumber suggested is less costly than surfaced material and millwork and requires less labor and expense to install. You will also find that your painting bill has been reduced to a minimum, so that you will not only be a benefactor in having put in existence something that is an ornament to the community but you will have benefitted yourself financially.

If this article has inspired any new thoughts or ideas either in the mind of some home-seeker or some one who prepares plans for these home-seekers, and if these parties will write to the editor of this publication another article will be published answering any inquiries that may be made and giving some general ideas as to the inside woodwork and trimming that would carry out the rustic idea, and that would make the interior also convey the suggestion of repose, simplicity and truth.



Office of Old Faithful Inn, Yellowstone Park C-284



Typical Log Bed Room C-285

*Architecture

By W. H. WHEELER, Engineering Department of Southern Pacific Company

MR. PRESIDENT, Ladies and Gentlemen, Fellow Members of the Hillside Club, Berkeley:

I was, indeed, flattered when invited by our worthy president, at the last meeting of the club, to read a twenty-minute paper on "Architecture —its Development in California." I appreciate the compliment and am pleased with the opportunity of being with you tonight, but I have some misgivings as to my ability to interest you.

I intend tonight, if possible, to give expression to some thought regarding practical matters which are lost sight of, but which force themselves upon the attention of the young architect the moment he gives practical sense to aesthetic creation.

I am aware that the following remarks are to be the theme for general discussion; hence my intention to generalize, rather than to trespass upon the threshold of detail, and as to the discussion, the more you disagree with what I have to say the more educational it will be for us all. Such discussions are generally more profitable and beneficial, to the audience, than an address of technical speakers. Let us hope that this may prove no exception to the rule.

Protection from the inclemency of the seasons was the mother of architecture. Of little account at its birth, it rose into life and light with the civilization of mankind, and proportionately as security, peace and good order were established, it became not less than its sisters, painting and sculpture, one method of transmitting to posterity the degree of importance to which a nation has attained, and the moral value of that nation amongst the kingdoms of the earth. It is only when a nation has attained that degree of power and harmony that architecture can be said to exist in it. Hence it is that architecture in its origin took the varied forms which have impressed it with such singular differences in different countries, differences which, though modified as each country advanced in civilization, were in each so stamped that the type was permanent, being refined only in a higher degree in their most important examples.

The original classes into which mankind were divided we may safely assume as three. Hunters, shepherds and those engaged in agriculture, and the habitations which each class would require would, of course be characterized by their several occupations.

The hunter and fisher found their accommodations in the caverns of rocks, and the indolence which those states of life induced made them insensible to any greater comfort than that which caverns afforded. Jeremiah, chap. 49, verse 16, speaking of the judgment of Edom, says: "O thou that dwellest in the clefts of the rock, thou holdest the height of the hill."

To the shepherd, the inhabitant wanderer of the plains, as pasture became inadequate for his flocks, another species of dwelling was more appropriate; one which he could remove with him in his wanderings. This was the tent, the type of architecture of the Chinese, whose people were like all the Tartar races, shepherds or dwellers in tents.

Where a portion of the race fixed its abode for the purpose of agriculture, a very different species of dwelling was necessary. Solidity was required as well for the personal comfort of the husbandman as for preserving from

* Read before the Hillside Club of Berkeley.

one season to another the fruits of the earth, upon which he and his family were to exist. Hence, doubtless, the hut, which most authors have assumed to be the type of that glorious creation, Grecian architecture.

Reeds, canes, the branches, bark and leaves of trees, clay and similar material were used in the construction of these earliest forms of habitations. The first houses of the Egyptians were reeds and canes interwoven. The same material served to form the houses of the Phoenicians. According to Pliny, the first houses of the Greeks were clay, they not knowing of any process of hardening clay into brick. The Abyssinians still build with clay and reeds.

The period at which stone was originally used for architectural purposes is quite unknown, as is that in which cement of any kind was first employed as a medium of cementing masonry. They were doubtless the invention of the race which we have mentioned as cultivators of land, to whom is due the introduction of architecture, properly so called. To them solid and durable edifices were necessary as soon as they had fixed upon a spot for the settlement of themselves and their families.

Chaldea, Egypt, Phoenicia, China are the first countries on record in which architecture, worthy the name, made its appearance.

From here I skip detail of period and arrive at that human inquiry, What is the definition of architecture? A learned writer on archaeology has stated it may be studied from two distinct points of view. Either it may be regarded statically and described scientifically as a thing existing, without any reference to the manner in which it was invented, or it may be treated historically, tracing every form from its origin and noting the influence one style had upon another in the progress of time. The superiority of the latter is that it becomes instead of a mere art to the artist or employer, one of the most important adjuncts of history.

Painting and sculpture rank among what are called phonetic arts, while those which contribute to the wants of man, such as food, clothing and shelter, of which architecture ranks, are known as the technic arts.

1. What is the true definition of the word architecture or of the art to which it applies?

2. What are the principles which ought to guide us in criticizing architectural objects?

Fifty years ago the answers to these questions generally were, that architecture consisted in the closest possible imitation of the forms and orders employed by the Romans; but this was somewhat modified by the publication of Stuart's works on Athens.

At the present day, churches generally adhere to the mediaeval designs, while public halls, libraries, legislative buildings, etc., adhere to classic forms, alternating between Greek and Roman, and in some of our large mansions and churches that compromise between classicality and common sense which is called Italian; so it is the duty, or I might say, the function, of the historian of architecture to trace the origin, growth and decline of the architectural styles which have prevailed in different lands and ages, and to know how they have reflected the great movements of civilization. It is also his function to explain the principles of the styles, their characteristic forms and decoration and to describe the great masterpieces of each style and period.

Style is a quality. The historic styles are adjuncts of development. Style is character expressive of definite conceptions, as of grandeur, gayety or solemnity. It is not the result of mere accident or caprice, but of intellectual, moral, social, religious and even political conditions.

Gothic architecture could never have been invented by the Greeks nor could the Egyptian styles have grown up in Italy. Thus the history of

architecture appears as a connected chain of causes and effects, succeeding each other without break, each style growing out of that which preceded it; a springing out of the fecundating contact of a higher with a lower civilization.

To study architectural styles is therefore to study a branch of the history of civilization.

Technically, architectural styles are identified by the means they employ to cover enclosed spaces; by the characteristic forms of the supports and other members (piers, columns, arches, mouldings, entablatures, traceries), and by their each individual decoration, the plans receive consideration since they show the arrangement of the points of support, and hence the nature of the structural design.

From the first development of the art, in the Nile Valley, a second development is found in the valleys of the Tigris and Euphrates. Through various channels, the Greeks inherited from the Egyptians and Assyrians, the Romans in turn adopting the external Greek detail which gradually developed into a complete and original system of construction and decoration, and spread it over the civilized world, which (thanks to those glorious disciples of the art whose names will forever be revered by all students of archaeology) has never wholly outgrown or abandoned it.

With the fall of Rome and the predominance of Constantinople, these forms transformed to another shape, called the Byzantine, or the development of the Christian domical church architecture, and here we find that the tameness of blindly-followed precedent was avoided, and the departure from traditional tenets contributed undoubtedly to the originality of Byzantine architecture.

The Oriental taste for brilliant and harmonious and also minute decoration are from the phonetic standpoint the chief characteristic of this style of architecture; but from the technic standpoint they kept to the traditions of the Roman in relation to the distribution of weights and strains of the vaulted structures, upon isolated and massive points of supports, strengthened by deep buttresses as the occasion demanded.

I might here delve into detail and describe the pendentive, their geometrical ornament, etc., but I must pass on to the period about the year 710, when Spain, the proud Castilian kingdom, was overrun by the Moors, who left their architectural genius as a monument to the future generations, in the shape of mosques and palaces, and although this same race was dominant through the world at this period, yet the most splendid phase of this branch of Arabic architecture is found not in Africa but in Spain. I allude to the Alhambra at Granada.

The petty kingdoms into which the different cities of Spain were divided by the Moors were eventually recovered one by one by the Christians during the fourteenth and fifteenth centuries, the capture of Granada in 1492 finally destroying the Moorish rule.

The power and dominion of the Moors in Spain were emphasized by high civilization and extraordinary activity in building, and even after their expulsion the style they introduced became natural in the regions they occupied.

With the series of campaigns from 1217 to 1252, which began the overthrow of the Moorish dominion, began the development of Gothic architecture, and with the resulting spirit of exultation and wealth accruing from booty, came a rapid development of this style, mainly under French influence, which was at this period producing some of the noblest examples. This style sufficed for a while to meet the requirements of the presumptious and luxurious period which in Spain followed the overthrow of the Moors and the dis-

covery of the new world, America. But it was inevitable that the Renaissance should in time make its influence felt in the arts, largely through the employment of Flemish artists, in jewelry and silverware, arts which received a great impulse from the importation of precious metals from the new world, so that Renaissance found special acceptance which was characterized by surface decoration, spreading over broad areas especially around doors and windows, florid escutcheons and Gothic details, mingling with arabesques delicately chiseled.

From Philip II's reign, in 1556, this style was succeeded by a coldly classic, singularly devoid of any originality and interest, which lasted until the middle of the 17th century, then in turn by more debased and untrained extravagancies, from which Babel of styles existing at this period in Spain it is an easy matter to imagine the difficulties of the untrained designer or architect to tell where one architectural conception ended and the other began, and it is at this point that I leap from Spain to the Missions in California, which were founded by the Jesuits, and from historical records we learn were in a flourishing condition in 1768.

It is also at this point I leave the trampled path of repeating history, and endeavor to elucidate or give thought to the style of architecture as it appears to me, when those self-sacrificing species of mankind of the Romish Church, who traversed the arid wastes and endured the buffeting of the wind and waves with one desire, one hope, to spread the teachings of Christ to the poor brain-deluded Indians. And did they succeed? I answer, yes. Nor did they enjoy the confidences of these poor aborigines by force or coercion. No, but by the system of educating them in the sciences relating to the nourishment of the body. Once that was perfected, it was a simple task to teach them what spiritual nourishment meant to the soul, being apt at the various industries taught them, such as agriculture, caring of stock and other arts of domestic life.

The next important step was the execution in a practical shape of the Church, workshops, storehouses and other chambers for the use of the teachers, etc., and various other quarters, the whole combined constituting the Mission, and from this class of structure we get the style termed Mission architecture.

By comparing the different photographs of the various examples more or less in the state of decay and desolation, I am inclined to think while studying probably the best example, namely, the San Luis Rey, that had the advent of the white settler, bringing with him the wants, ambitions and greed of Anglo-Saxon life, been postponed or delayed until a later date, that we would have seen, already cast in the rough by those unskilled geniuses who saw the grand examples of ecclesiastical architecture in their Motherland, and had reproduced them as best they knew, and remembered them, assisted by the unskilled hands of their flocks, a new style.

The composition of San Luis Rey as a mass is remarkable, and the pity of it, that some philanthropic lover of art or some association have not undertaken to send some of our young architectural enthusiasts in the form of traveling scholarships, which honor would be won by competition, to make complete measurements and of other agricultural data so that we may have, if not the restoration of the structure, a detailed memento, in book form, of scale drawings to leave to posterity how near we were to a new style.

This system of restoration is very frequent among the great architectural societies of the Old World and in the East, and I say if explorations can be sent yearly to Greece, Italy, etc., by these societies, why cannot some such restoration expeditions be sent from here and delve in the ruins of California and even Mexico?

It may be seen by photographs, and I might say by personal observations, for a few months ago I paid a visit to the old Mission at Santa Barbara, and during my short stay I made minute inspection of the structure. I found that solidity was one of their crowning features. Of course, there seemed to be buttresses placed out of keeping with the design, but I presume that they were afterwards built to strengthen what has proved to be too weak to withstand the shocks of earthquakes.

Color was another feature, the foliage beautifully combining with the light color of the exterior, crowned with a roof of red tile. Would that shingles were banished and tile and slate used in their stead today.

And so we read that the ruins of the Missions were completed by the American conquest, the few remaining Indians having been driven away. The old friars had departed in disgust and anguish; some of the churches were sacreligiously degraded to the use of stables. In others many parts were demolished for the sake of the timber, tiles and other material they afforded. But it is certainly refreshing to learn that an attempt had once been made by the Government to procure an estimate of the expense of repairing and re-establishing San Luis Rey to its former condition, but as devastation and neglect had made too great an inroad upon the vitals of the structure to warrant the cost of restoring, it, of course, was abandoned. But to quote a celebrated writer on Mission architecture: "This Mission stands today, magnificent even in its ruins, a monument of the piety, industry and disinterestedness of the venerable monks who were the first colonists of Alta California."

And not only this old ruin, but numerous others which doubtless you are more familiar with than myself, serve the purpose of furnishing a very notable portion of the middle distance for many a canvas by our local landscape painters.

The advent of the Anglo-Saxon on the discovery of gold from all the different nationalities as tabulated by Mr. Dooly in his analysis of that great race, "Bringing with them the architectural peculiarities of their different lands, thus making our cities, at their very start, a hotch-potch of every clime and condition."

A two-hours' walk around the older portion of San Francisco gives the student of architecture a decided attack of head reel; while a tour through the more modern sections renders him a fit subject for the Insanity Commissioners.

In the older portions of the city one is alternately delighted and depressed by what he sees along the streets which were the fashionable promenade and shopping centres of the early days—notably Clay, Commercial and Sacramento streets. One finds the simple substantial stone buildings, containing lines and simple ornamentation, suggestive of a continental, or, more properly speaking, French origin, the buildings themselves, being constructed of the best materials and workmanship and remaining in good condition to this day. A particularly good example of this class of construction was the old City Hall, the site of the present Hall of Justice, but which was originally the Jenny Lind Theatre; and it is very interesting to note the advancement of the city through its buildings from this period of simple, solid style to the examples, notably where the successful pioneer had endeavored, by an over-indulgence of saw-mill or band-saw architecture, to let the world know how much money he possessed; and I have no doubt he succeeded; and this style has and still prevails in a smaller degree in the sections where flats predominate; but thanks to the—shall I say the artistic sentiment that is beginning to dominate us—originality in minute forms and other features is now in vogue, it is no more the cry: "Oh, I want a design the same as Brown, Jones

and Robinson," but instead, "I want a design different from anybody else." And if the proper architect is thus appealed to, then you can reckon they will get something different. And so it is with the larger buildings—you find the same conditions. The general class of large mercantile buildings as exemplified by some recent structures is of a high order, and I must right here express my admiration for at least three bank buildings, and by an illustration recently published in our daily papers another bank building is contemplated, which designs are in keeping with their purpose. There is no necessity of asking if this is a bank or a church.

There is an edifice missing in San Francisco. I allude to a cathedral. A cathedral that will be symbolical of piety and that is a true Gothic example, something that will be a monument for future ages, classed with such edifices as Notre Dame, Paris; Cologne Cathedral, Ulm Cathedral, Germany, or Durham Cathedral, England. Is it possible?

There is also another edifice missing in our large city of San Francisco which I am sure would gratify the hearts of, I would say, eighty per cent of its population, and that is a City Hall or Auditorium, where there would be installed a large organ, where every afternoon during the week recitals would take place for the education of a people where music is one of their gods; then I would assume those vice-traps—I allude to the cheap matinee theatres—would not gather in the easily-earned sheckles and pluck the flowers of our land, as is exemplified by ordinary observation every day in the week.

We have in Berkeley, some fine original types of rural architecture and for a rustic interior, the most enchanting I have ever seen, and I have been outside of California, is the interior of Hearst Hall, well worthy the visit of any sightseer when visiting the University. We have had unfortunately no building restrictions, in Berkeley, to speak of; so long as the general plans pass the plumbing inspector, or are carried out according to the fire ordinance regulations, there is no further worry. Why has this large town not awakened before this late date to such a necessity? Such necessity is a proper code of building restrictions under the guidance of a properly trained architectural inspector, one who is trained in the **phonetic** and **technic** points of the profession, then we may get something different to the drygoods-box styles so prominent among us to-day, whose owners sit up until the early hours of the morning asking Divine Providence to raise a Jack and Beanstalk foliage to hide the eyesore. Would that we could frame a local law, which is in vogue in France, wherein plans and specifications, when submitted, would not only be submitted for stability, sanitation and the like, but also for the approval of the elevations, and **if** such designs **were** not up to an architectural standard, **they would** be returned to the designer for further consideration; then we would not have to depend entirely on the greatest and grandest architectural ornament, foliage and flowers. I hope to see the day when plans shall read like this: North, south, east and west elevations, instead of as now; front rear and side elevations.

In conclusion I desire to express my pleasure and co-operation in that valuable article on home biulding in California, by Mr. Chas. Keeler, published in the Architect and Engineer.

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Willie to the circus went,
He thought it was immense;
His little heart went pitter-pat,
For the excitement was in tents.
—Harvard Lampoon.

How to Become an Architect

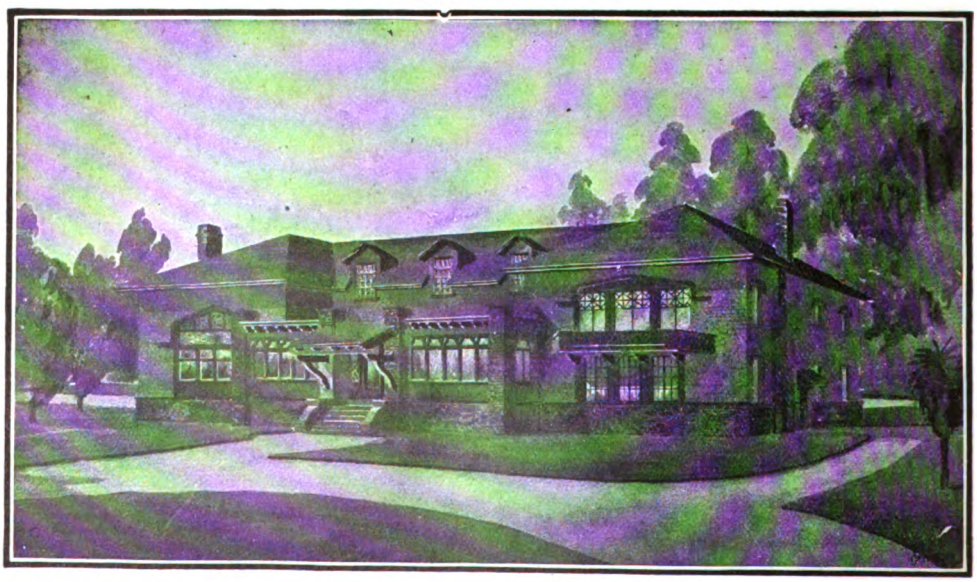
By A. D. F. HAMLIN, Professor of the History of Architecture, Columbia University, in "Inland Architect"

ON answering the question "How to Become an Architect," I have chosen to confine myself to one part only of the question, that, namely, of the educational preparation of the architect for entrance upon his profession. The first step toward becoming an architect is to decide what sort of an education is necessary, and this is the question I shall try, in a very brief way, to answer. The ideal education for the architect is an ideal that can never be realized. So many and so varied are the kinds of knowledge exacted of the modern architect that a life time is insufficient for the complete mastery of them all. By the time the ambitious student, beginning his studies in early life, had successfully completed the entire course and was ready to begin practice, he would also be ready for the grave. No practitioner can ever attain complete proficiency in all branches of his profession, even in a long life of activity, accompanied by constant study; much less can the student, no matter how admirable the school and the course of study, complete his education before he begins his professional life. Hence any course of study, any plan of architectural education, must be laid out upon a basis of compromises and omissions. Everything that can best be learned by the actual routine of the office—within its own field the most admirable of schools for the wide-awake man who knows how to profit by its opportunities—must be left to the office to teach him, and among the still almost countless subjects in which proficiency is desirable, some must be emphasized, some passed over but lightly, the rudiments only being inculcated; and many must be omitted altogether. So far as the formal teaching of the schools is concerned, it can only lay the foundations and teach the student how to build upon them. The student must himself erect the superstructure, by incessant observation, reading and study; by travel and by practice; by all the means which his subsequent career may offer him for self-culture and improvement.

Just because any scheme of architectural training, whether in a school or by home study, must be thus fragmentary and partial, there is wide room for diversity in the professional curriculums of different schools without sacrifice of efficiency or real inequality of training. Each will emphasize some subjects which others deem less important, each omit some things which others insist upon. The real test of the value of each system is not what it enables the student to do the first month after he has completed the course, but what it enables him to do five years later. One system may turn out clever draughtsmen, who will always remain merely clever draugthsmen. The graduates of another may be far less clever as draughtsmen, on graduating, and yet become the promising architects of the next decade and the leading architects of the following one. The second is the better school. It has laid broader foundations, and taught its pupils better how to build thereon.

The young man who is contemplating the study of architecture as a profession sees before him, apparently, two avenues of approach to the final goal; one through the office, that is by a course of apprenticeship; and one through a professional school of some sort. In reality there is but one, for no one can attain a mastery of the profession by either means alone. Whichever he enters first he must supplement by the other, and it makes little difference which he enters first. And if in opposition to this claim that both are necessary, you

Residence of Mr. J. E. Cook, Los Angeles *Hunt & Eager, Architects* C-286



San Francisco Golf Club House. *Ralph Warner Hart, Architect* C-287

(Courtesy of Sunset Magazine)

cite the example of distinguished architects who have never been to a professional school, I answer that these are the men who have made their whole career a school, supplementing the routine of the office by the hardest kind of study through long years. Moreover, these are the very men who, conscious of their own deficiencies and of the tremendous cost in time and energy of the learning they have acquired, are often the most earnest advocates of a thorough course of study in a first rate school.

In any course of education there are two ends in view—knowledge and discipline—the inculcation of facts and formulas, and the training of the mind in the use and application of the information so acquired. A diligent reader may acquire information from books, but discipline requires the teaching, example, and guidance of competent instructors, besides laboratories, libraries, draughting rooms and the paraphernalia of a well-equipped institution. At least, these make the discipline far broader and more efficient than any single private instructor or atelier can make it, while they also communicate information with a fulness and thoroughness impossible with home study, correspondence teaching, or private instruction. By long experience, by constant striving after the highest results, they have learned how to communicate knowledge and what knowledge, in each branch, is most essential; while the contact of student with student, the friendly emulation and constant interchange of ideas in a school, make the acquisition of knowledge as well as of discipline, doubly efficient and stimulating.

By all means, therefore, let the young architect go to a school of architecture; to the best school he can find, preferably in a large city where his whole environment will help to educate him professionally. The concentration of his entire strength for a few years upon the business of professional study will make that study doubly valuable and in the end effect a great saving of time. Concentrated energy is always more economical and efficient than divided energy. The system, regularity and thoroughness of the school training are extremely valuable elements in the formation of the habits which will dominate his after life. Any school of architecture is better than no school; the best school is the one which takes the broadest view of what the architect should be and know, and trains him for it by the strictest discipline and by enforcing the highest standards.

After the school course, or before it, if the student begins his office training so early that his mind will be still plastic when he enters the school, comes the apprenticeship of the office. The school graduate, when he first begins this apprenticeship in the office, finds it new and strange. All his theoretic knowledge and his long years of discipline seem at first of no account whatever. He is a novice, a freshman in office ways. For a month or two he hardly earns his salt. But if his schooling has been sound he will before long "find himself," and every day in the office will become more and more profitable to him, and he to the office. He finds himself in a new school, indeed, but in one in which, more and more, his earlier schooling proves of value. In a year's time he has distanced all the novices who have not had the advantage of such training, and in two or three he becomes not only a most valuable and useful draughtsman, but in a very true sense, an architect. He is well equipped for independent practice, should the opportunity present itself.

If, on the other hand, he has begun his studies with an office apprenticeship, his advancement has been much slower. After two or three years he begins to appreciate the limitations of mere office training. If he then enters the school he finds himself at first indeed a novice, in a new and strange atmosphere, but his years of office work stand him in good stead. They

strengthen greatly his grasp on certain parts of his course of study and his appreciation of the value of others. Draughtsmen are very apt to be the most enthusiastic students in a professional school. On graduating from it they stand nearly or quite where they would have stood at the same date had they taken their schooling first and their office work afterward.

But even the school and the office cannot suffice to complete the architect's training. The studies of the school have given him, after all, only rudiments, introductions to various fields of useful knowledge, beginnings in various kinds of intellectual and artistic training in which the ambitious architect will certainly desire and need further advancement. This he must accomplish chiefly by reading and travel. It is important to cultivate the habit of systematic reading, not merely of architectural works, but of general literature. The architect should be, of all professional men, the broadest in culture because his profession commands an outlook upon more and wider fields than any other. He is fortunate who has had the advantages of a college course, or of two or three years in college, before entering the professional school, who knows something, even a little, of the glories of Homeric verse, of the elegance of the Latin writers, of European history, of philosophy, of political science. It is an excellent plan to read a little poetry every day; to have some acquaintance with Shakespeare, with sonorous Milton, with Dante, with the sublime poetry of the Hebrews. All liberal culture tends to purify the taste, besides opening to the mind new sources of the keenest and highest enjoyment.

It is to be hoped, indeed, that the entire course of study, in and out of school, has tended to cultivate the taste. But the education of the taste should not stop with the school and office apprenticeship. If possible, the architect should travel, seeing with his own eyes the masterpieces of his art, forming his own judgments upon them, undergoing their silent but powerful influence, striving to master the secret of their beauty. He should visit as many as possible of the picture shows and art museums of his own city and country, whether he goes abroad or not, to keep his mind and taste open to the influences of the best things in all the arts.

I believe, also, in occasional participation in competitions in designs, especially sketch problems, even after the architect is engaged in independent practice. It is a good thing, now and then, to give wing to the imagination upon purely imaginary problems, unvexed by computations of cost and the limitations of purses and party walls. The Society of Beaux-Arts Architects is doing a good work for young draughtsmen in furnishing them with excellent design-problems to work upon; but I believe the older architects might well, once in a while, arrange to undertake problems of a little different character, larger in scope but requiring less time to work out, with advantage to themselves and to their clients.

There are many who cannot attend a professional school. For them, however, all the other means of education I have indicated are wide open. And I am quite sure, also, that the number is small of those who cannot compass the attainment of the school training, if they are really determined to seek it. The man who has to earn his own way through the school may have a long and hard fight to do it, but it is well worth the struggle. It may take him six years to cover a course that another completes in four, but the extra two years have also counted in his training. Such self-made graduates are among the most stalwart and influential men in the profession. Our schools of architecture are all democratic in spirit, and no man is looked down upon because he is earning his living and making his own way. For the man who is determined to get to the top, the best training is none too good, and is sure to be well worth all it has cost to win it.

Terra Cotta and Brick

Floated a Brick House Down the Allegheny River

A TWO-STORY brick house, sixty years old and weighing over 200 tons, was recently moved from Sharpsburg, Pa., a suburb of Pittsburg, down the Allegheny for a distance of five miles to the plant of the H. J. Heintz Co., at Pittsburg. Aside from the age and the structure of the house the moving was effected against seemingly unsurmountable obstacles and was certainly a feat of its kind.

The house was lifted by means of jacks and placed on blocks and rollers. From the very outset great difficulties were encountered. Between the house and the river was 800 feet of soft, marshy ground, apparently without bottom, and every moment it seemed that the old building would collapse. When the water's edge was at last reached the movers heaved a sigh of relief, though the worst was yet before them.

Before anything further could be done a severe flood arose and swept the country dooming many buildings in its path. The old brick house was surrounded by seething, pounding waters to a depth of half way to its second story, and stood midstream and almost inaccessible. The blocking and rollers were weighted down with steel rails and immense beams to prevent it being washed away.

At last the water abated sufficiently to permit the work to proceed. The house was moved down the river bank and lowered upon a huge coal barge.

The barge was fifteen feet below the level of the bank upon which the house stood. Huge blocks and timbers placed in rows rested on jacks in the bottom of the boat. A temporary foundation was built upon this, and when the top was on a level with the bank, a bridge was built extending from the land to the boat. Over this bridge the house was rolled, and then it was slowly lowered until it rested upon the bottom of the coal barge. Then slowly the down-stream trip proceeded, the barge being towed with great caution. Strong steel cable bands girdling the walls protected the old house from shocks.

In the four-mile trip there were four low bridges which must be passed under, and in each instance it was necessary to scuttle the barge. That is, the barge was sunk to a sufficient depth to allow the house to pass under clear of the bridge, by letting in sufficient water for the purpose. After passing under the bridge the water was pumped out. At one bridge the house had to be lowered six feet. The next excitement was lowering barge and house through a lock. This was successfully accomplished and the river trip completed without disaster.

In the final move to its new location it was necessary to cross three tracks of a railway system in just one hour. This close time schedule was conformed with, and an exceptionally clever piece of work was finished without further adventure. The house was moved purely as a matter of sentiment. The house was built in 1854 by Mr. Heintz's father, who was at that time a brick manufacturer and general contractor.

The work of removing it began on the second of one month and was completed on the fourteenth of the next, a little over one month.—Ex.

✦ ✦ ✦

Prevailing Style for Churches

SIGNS begin to be in evidence that even the ecclesiastical preference is running backward to the classic Mediterranean and away from the habitual Gothic, many churches of late being modeled with the dome, the column and pillars, the low proportions which gave such grace to the structures of ancient Italy and Greece. The Christian Church, perhaps, has been the most consistent pioneer in this direction, as will be shown in the following from the Kansas City Star descriptive of an edifice erected in that city:

"The Independence Avenue Christian Church, at Gladstone Boulevard and Independence avenue, has been completed at a cost of $125,000. Of this amount R. A. Long, the lumberman, gave $70,000. The new church is a handsome house of worship. Howe, Hoit & Cutler, architects, designed the structure as nearly to a pure Grecian Ionic style as compatible with the requirements of modern church usage. The main floor of the church is elevated a little above the sidewalk and is reached by wide steps through a great portico.

"The plan of the auditorium starts with a Greek cross having shallow arms, the intersections of which are surmounted by a low dome, furnishing light through a shallow inner dome directly over the center of the main auditorium. The auditorium is further lighted by windows in three of the arms of the cross. The fourth arm is occupied by the pulpit, organ and other equipments of the church service. The auditorium has a seating capacity of about 1200, with the possibility of a limited extension and increase by filling out the gallery space. The gallery is in the form of a horseshoe, inclosing three sides so arranged as to bring the gallery seating very close to the pulpit.

"The interior of the main auditorium is treated in low, simple, vaulted and grained work with the surfaces kept broad and plain. Practically none of the structural lines is recognized in the architectural treatment. This has given an auditorium admirably adapted to acoustic requirements yet simple in its details, and well adapted to the use to which it is to be put.

"The whole interior of the edifice is in white, relieved with low tints, conforming to the simplicity of the whole scheme. The doors, rails of gallery, stairs and similar places are in mahogany."

✦ ✦ ✦

"Eddie," said a mother to her little son, "I wish you would run over and see how old Mrs. Smith is. She has been quite ill."

In a few minutes Eddie came running back and reported: "She said to tell you it was none of your business."

"Why, Eddie," said the astonished mother, "what did you ask her?"

"Just what you told me to," replied the little innocent. "I told her you wanted to know how old she was."—Technical World.

Seventh International Congress of Architects

THE Seventh Congress will be held in London, July 16 to 21, 1906. The subjoined are the subjects for discussion:

1. The Execution of Important Government and Municipal Architectural Work by Salaried Officials.
2. Architectural Copyright and the Ownership of Drawings.
3. Steel and Reinforced-Concrete Construction: (a) The general aspect of the subject; (b) with special reference to aesthetic and hygienic considerations in the case of very high buildings.
4. The Education of the Public in Architecture.
5. A Statutory Qualification for Architects.
6. The Architect-Craftsman: How far should the architect receive the theoretical and practical training of a craftsman?
7. The Planning and Laying out of Streets and Open Spaces in Cities.
8. Should the Architect have Supreme Control over other Artists or Craftsmen in the Completion of a National or Public Building?
9. The Responsibilities of a Government in the Conservation of National Monuments.

The executive committee will be glad to receive papers on any of the above subjects for presentation to the Congress. Papers may be written in English, French or German.

Each paper must be accompanied by an abstract of not more than 1,000 words.

Papers and abstracts must reach the executive committee before the 30th of April, 1906.

All communications to be addressed to the secretary of the executive committee, 9 Conduit street, London, W.

The general permanent committee of the Congress consists of eighty-six members, with eleven from England, fifteen from France, seven from Germany, six from Austria, four from Belgium, two from Canada, three from Denmark, six from Spain, five from the United States, seven from Italy, three from Mexico, three from Netherlands, four from Portugal, four from Russia, three from Sweden three from Switzerland and one from Turkey.

The permanent committee for the American section is as follows: W. L. B. Jenney, F. A. I. A., chairman; William S. Eames, F. A. I. A., vice-chairman; Francis R. Allen, F. A. I. A.; Glenn Brown, F. A. I. A.; George O. Totten, Jr., A. A. I. A., secretary.

The American committee of patronage of the Seventh Congress consists of:

The Honorable the Secretary of State; the Honorable the Secretary of War; His Excellency the American Ambassador to Great Britain; Honorable Francis C. Newlands, U. S. Senator; John M. Carrere, Esq.; Honorable Joseph H. Choate; Frank Miles Day, Esq.; Daniel C. French, Esq.; Henry C. Frick, Esq.; Cass Gilbert, Esq.; John La Farge, Esq.; Charles F. McKim, Esq.; Francis L. Millet, Esq.; J. Pierpont Morgan, Esq.; Henry Siddons Mowbray, Esq.; Robert S. Peabody, Esq.; George B. Post, Esq.; Augustus Saint-Gaudens, Esq.; James Stillman, Esq.; J. Knox Taylor, Esq.; Henry Walters, Esq.; Prof. W. R. Ware.

The Presidents of the following Societies: American Institute of Architects, Architectural League of America, National Academy of Design, National Sculpture Society.

Society of American Artists, members ex-officio: Francis R. Allen, Esq.;

Glenn Brown, Esq.; William S. Eames, Esq.; William Le Baron Jenney, Esq.; George O. Totten, Jr., Esq.

A meeting of the permanent committee was held in Paris on December 15th in connection with work for the next Congress.

♣ ♣ ♣

Tallest Buildings in the World

THE tallest structure in the world is soon to be erected in New York. When completed it will occupy the space at the southeast corner of Twenty-fourth street and Madison avenue, where Dr. Parkhurst's church now stands.

The Metropolitan Life Insurance Company will erect this magnificent tower, which will be higher than Washington Monument. Plans for its construction are now under consideration by the company whose home office building occupies most of the block bounded by Twenty-third and Twenty-fourth streets, and Madison and Fourth avenues, and is one of the largest in the city. It will exceed all other business edifices in every dimension when the present plans are carried out.

According to the present plans, the tower will bear about the same relation to the main building that the Madison Square tower does to the Madison Square Garden building. The site of the Metropolitan tower has a frontage of 75 feet on Madison avenue and 150 feet on Twenty-fourth street. This will give a base area of about 11,230 square feet, which is considerably more than that of the Washington Monument. There will be offices in the tower, and, of course, elevators. There will be an observatory at the top, surmounted by a huge flagstaff.

The present plans, it is said, call for an edifice 70 feet square and 560 feet in height, but definite plans have not been fully decided upon as to minor details. The officers of the company have settled upon one point, that it shall exceed in height any tower in the world.

In erecting such a tower the engineering problems to be faced are not considered difficult by experts; but the architectural and artistic effects are certain to give more or less trouble. Very few of America's tall buildings are considered architecturally successful, Madison Square tower being one of the few. Washington Monument wins by its massive simplicity alone.

The World's Tallest Structures.

	Feet.
Metropolitan Tower (proposed)	560
Washington Monument, tallest structure	555
Philadelphia City Hall	537
Cologne Cathedral	512
Pyramid of Cheops	479
St. Nicholas Church, Hamburg	473
Strasbourg Cathedral	465
Park Row Building, tallest business structure	380
Liberty Statue	305
Hotel Belmont, tallest hotel	292

This table includes spires, towers and other structures.—New York World.

Cement and Concrete

Longest Reinforced Concrete Bridge in the United States

By FRANK M. BUTLER

MANY reinforced bridges have been constructed throughout the East and Europe during the past few years but, until quite recently, this class of bridge has not been used on the Pacific Coast. Lately, however, several large concrete structures have been built here, the most notable recent ones having been built by the Pacific Construction Company of San Francisco. At present this company has three large concrete bridges under construction: one across Dry Creek in the town of Modesto; one over the Stanislaus River at Ripon, which is to replace the old 200-foot combination span and long trestle approaches on either end, and the bridge for the counties of Fresno and Madera, over the San Joaquin River at the town of Pollasky. This latter structure is worthy of special notice inasmuch as it is the largest reinforced bridge yet constructed on the Coast and is, in fact, one of the longest if not the very longest modern concrete bridge ever built in the United States.

Work on the structure was begun in August last and, at this writing (January 12th) the bridge is complete except for the earth fill which is to make the roadway.

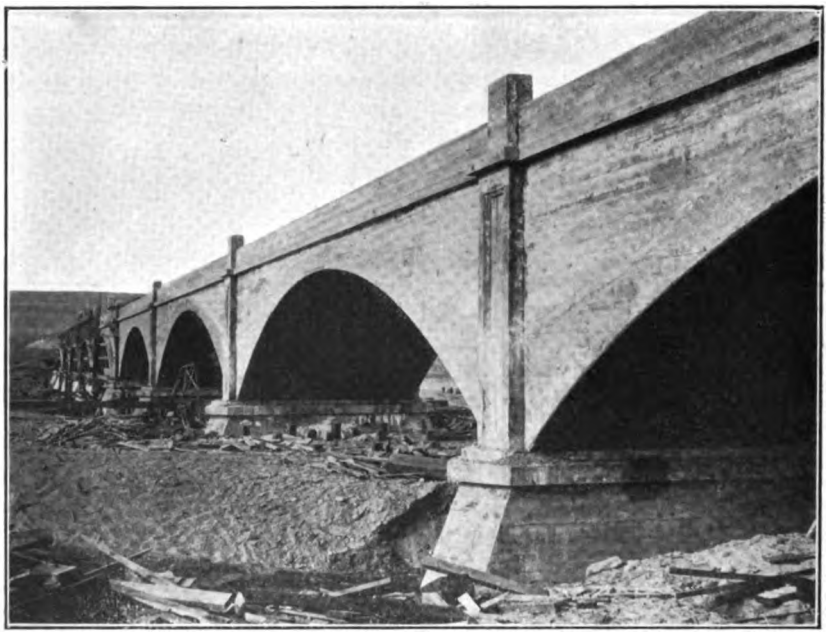
The bridge consists of ten spans of 75 feet each and has heavy end abutments with wing walls extending into the natural banks at either end. The roadway is 18 feet wide in the clear.

The river bottom at this point is composed of sand and gravel underlain with a soft decomposed granite bedrock and, at the season when this construction was prosecuted, the river was very low, the running water being not over 300 feet wide.

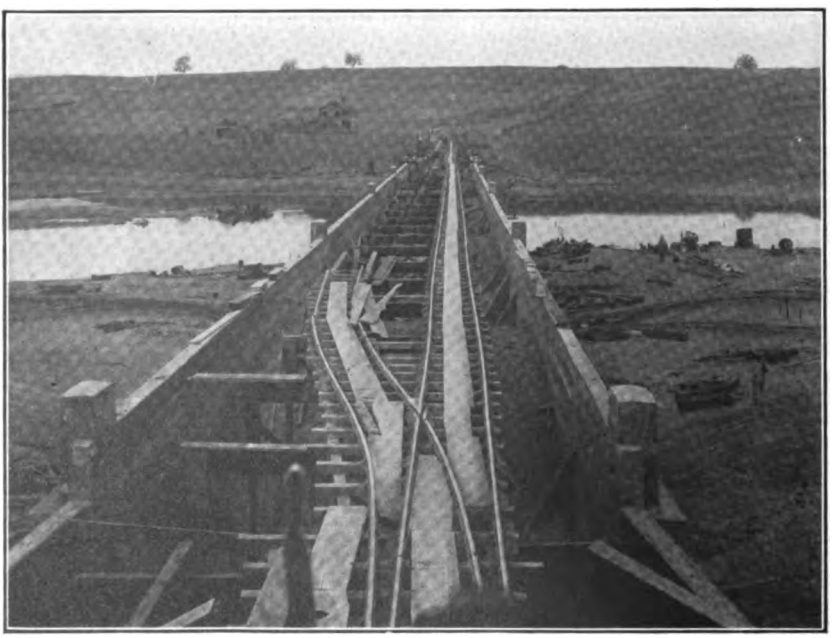
The piers are 31 feet long and 8 feet wide at the base and their foundations consist of thirty-three 12 x 12-inch blackheart redwood square piles in each. These piles were shod with heavy solid pressed steel shoes and were driven hard into the bedrock with a 3800-pound hammer. Coffer dams were placed around each pile cluster and the water and sand was pumped out from around the piles and the piles were then cut off about three feet below the lowest low water level and the concrete piers were then built thereon.

The end abutments are very heavy walls placed directly on the bedrock without piles and they, as well as the wing walls, are reinforced with corrugated bars as is the bridge proper.

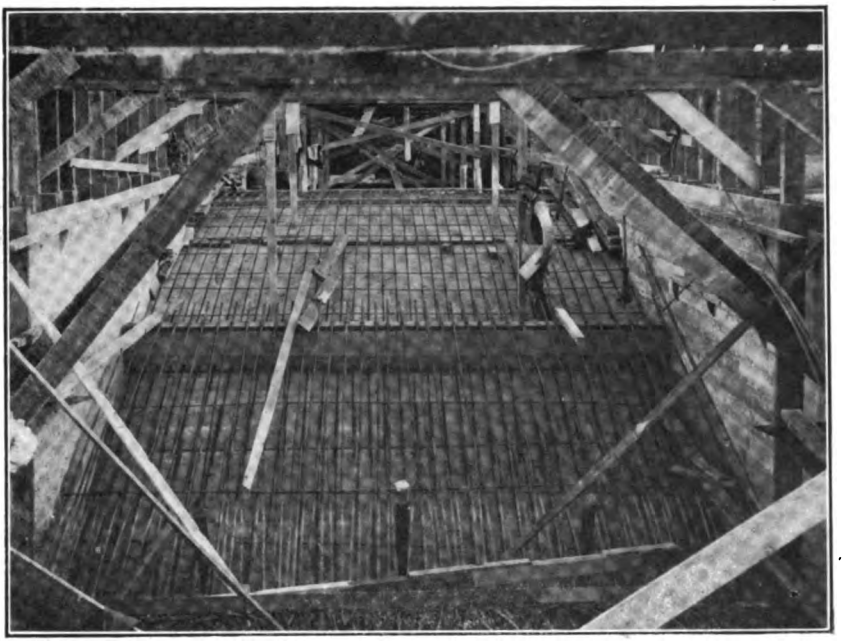
The arch rings of the spans have a rise of 11 feet 6 inches, the concrete being 18 inches thick at the crown and 3 feet 6 inches thick at the spring line.



Reinforced Concrete Bridge, Pollasky. View from East End C-307



Reinforced Concrete Bridge, Pollasky. View Showing Walls and Buttresses; also Service Track. C-308



Reinforced Concrete Bridge, Pollasky. View Showing Reinforcement C-309

These rings are reinforced by two layers of corrugated bars, the bars in each crossing each other at right angles and are securely wired at each crossing. The lower course of this reinforcement was placed 2½ inches above the underside, or intrados, of the arch and consisted of ¾-inch bars, spaced 6 inches apart with ½-inch bars, two feet apart, laced at right angles. The upper course, just below the extrados, beginning at the piers, consisted of ⅞-inch bars, three inches apart, then ⅞-inch bars 6 inches apart and, over center, ¾-inch bars 12 inches apart, all interlaced with ½-inch bars.

The spandrel walls are 9 inches thick on top and 12 inches at bottom. These walls might be considered light, and would be, were it not for the fact that they were reinforced by an elaborate system of corrugated bars and braced and anchored to the arch rings by buttress walls, also reinforced. This was a particularly economical and efficient construction and a notable improvement on old methods. In the spandrel walls the rods are spaced 6 inches apart in bottom and 12 inches apart at top and all the vertical rods are spaced 24 inches apart with lower ends embedded into the arch ring concrete. The top of these walls carries a coping having a 6-inch projection and the railing consists of a pilaster over each pier with two-foot walls between, these walls forming a base for a single plain gaspipe railing.

Expansion joints were put in to guard against changes of temperature. This was done by the introduction of a sheet of heavy tarred paper into the concrete and special buttresses were built on either side of the joints which were securely anchored to the walls and rings, thus firmly bracing the walls at the points thus broken.

Three 4-inch iron drain pipes were provided at each pier for drainage from the roadway.

The filling for the roadway is the river gravel, which was delivered into hoppers near the center of the structure by means of a bucket elevator,

operated by steam, and thence distributed to place by cars over the service tracks.

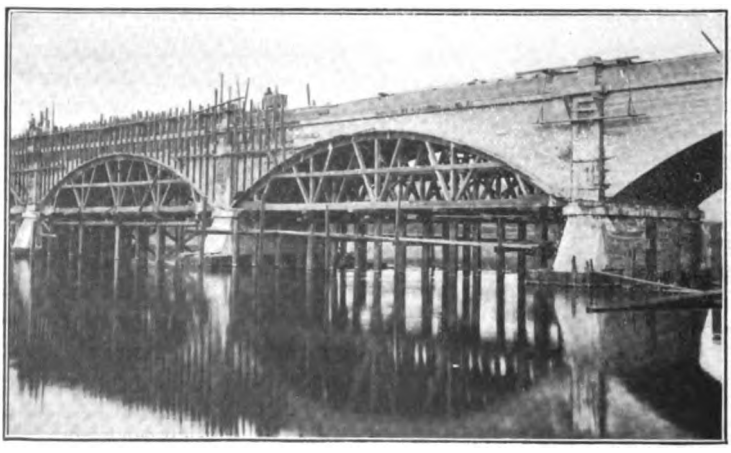
The materials were stored at the east end of the site on the natural bank there which was about level with the floor line of the completed structure, and the mixing was done with an automatic mixer, the concrete being thence delivered to place in mining cars operated over a double service track which was built along the center line of the roadway and extended as the work progressed.

The weight of this structure was about 300 pounds per square foot and, to carry this heavy load safely during construction, especially heavy falsework was necessary. Five pile bents, in each span, were driven for this falsework, the bents being capped with 6 x 12-inch timbers and, on this, supported on double 3 x 12 x 24-inch wedges, were five trusses each made with bottom chords and posts of 6x8-inch and segments made of two layers of 2x12 inch and one layer of 4x10 inch. The lagging was 2½x8 inches, bevelled and dressed. Trusses for six spans only were made, those used in the first four spans being taken out and moved bodily forward to be used in the last four spans.

Golden Gate cement, made by the Pacific Portland Cement Company, was used in this work, with the local sand and gravel taken from the river bed, and the concrete thus made was of excellent quality and most satisfactory.

The bridge is a County Highway bridge connecting Fresno and Madera Counties and was built by the two counties jointly.

Mr. J. B. Leonard of San Francisco designed the structure under general direction of the surveyors of the two counties and the Pacific Construction Company of San Francisco, were the builders, the work being done under the immediate supervision of their superintendent, Mr. F. B. Field.



Reinforced Concrete Bridge, Pollasky. View Showing Falsework and Sheathing C 310

Hollow Concrete Blocks

IN the development of Hollow Concrete Building Blocks the pathway of success has naturally been land-marked by failures, yet its architectural possibilities are so great that there is scarcely a rock building in existence that cannot be duplicated in Hollow Cement Stone, and notwithstanding the "knocks" it receives it bids fair to supplant both brick and stone, writes a correspondent.

Its range of possibilities is recognized in the East, where it is considered a factor to be taken seriously, and in Philadelphia, Pa., and Newark, N. J., it has been so extensively used that special ordinances regulating its manufacture and use are silent evidences that it is making itself both felt and heard.

As competition is so keen in this twentieth century, manufacturers have been brought face to face with the problem of constructing a machine which would produce the most effective stone at the least possible cost to the operator, and a great deal of ingenuity has been injected into this part of the Hollow Block industry, resulting in the creation of upwards of 200 machines of various stages of usefulness.

The machine technically known as the "face tamp" machine, from the mode of making the block, should at once be superior to all other makes, for the simple reason that it permits of a rich facing mixture being used on that part of the stone facing the weather, and a coarser or stronger mixture for the balance of the block; the advantages of this are two-fold—from the point of economy it saves material, and from the point of strength the coarser is superior to the richer component.

The choice of a machine is of the highest importance, and due consideration should be given to the variety of output of the prospective machine; a machine that is limited to certain sized blocks is in itself a serious obstacle to a Hollow Block manufacturer, and in purchasing one of this description his hands are tied at the outset by its limited capacity, while he sees the best trade going to his competitors, who operate machines capable of producing a great variety of stone. The machine which adapts itself to all sorts of conditions, that can produce with equal facility any sized stone from ordinary standard building blocks to water-tables, window sills and lintels, is the one that will readily appeal to the practical mind; it is expedient to mention in this connection that the demand for window sills and lintels is very large, and any one manufacturing a good grade is sure to have all he can do of this class of work. Simplicity of construction should receive due consideration, and those machines that are absolutely free from intricate and complex gearing will be found to be the cheapest and most economical in the end.

* * *

Care Needed in Concrete Mixtures

WHILE block machine makers are pushing the sale of their machines with success, for the future of their business, a note of warning should be sounded against the salesman's enthusiasm causing him to underestimate and understate the requirements necessary for the successful manufacture of blocks.

We hear of customers being told that 1:8 and 1:10 mixtures is enough to make a good block. Losses and discredit to the industry are bound to follow

any such selling policy. Have the salesman urge a most conservative mixture; nothing less than 1:4 under the present system of curing, should be recommended.

The block machine men are beginning to get returns on their money invested and are building up substantial businesses. Every effort should be taken in guarding against prospective buyers being instructed that a cheap mixture will stand. The possibilities of concrete as a building material are not realized, but architects and builders are investigating. The block machine salesmen have it in their hands to prove the value of concrete as a building material if they instruct the buyers of their machines to make their mixtures according to the proper standards, and impress upon them the necessity of proper curing.—Concrete.

* * *

The California Mechanics' Lien Law from a Sub-Contractor's Point of View

THE California State Constitution says that any one furnishing labor or material on a structure of any kind shall have the right of lien. In the building industry, this has been the means of establishing the credit of a large number of contractors who do not possess the capital needed to conduct any other character of business.

Under the conditions, an energetic man who has sufficient dollars to pay his labor in putting the frame up, can take the contract for erecting a building, and his first payment will float him along nicely until the brown coat is on, when his second payment is due. A little of his energy will get him another contract about this time so that, when his first building awaits the thirty-five day payment, he will be having money from the second job to float the first one through. And so on ad infinitum.

Of course this is deserving of admiration for the enterprise displayed. But who really furnishes the money, and takes the risk? The lumber dealer and the sub-contractors. The lumber dealer is the only material man interested and according to decisions of the Supreme Court, has a prior lien over any sub-contractor. The labor comes first, and must be paid in full, then the material bills must be met, and if there is any money left in a settlement, the sub-contractor must take his pro-rata and look pleasant.

Although this is the law, it has been the practice in pro-rata settlements, for material men and sub-contractors to share and share alike, a courtesy we should appreciate. It is a case of getting justice in spite of the law.

Changes have been discussed for a number of years in the mechanics lien laws by the Builders' Exchange and Builders' Association, but in order to make a change, it will first be necessary to change the State Constitution. Such an amendment, put to popular vote would be certain of defeat as the layman would only see that the rights of the people might be restricted.

Both in Oregon and the Hawaiian Islands—two localities the writer happens to be familiar with—the laws are such that every one furnishing either labor or materials on work of any kind are fully protected to the extent of their claims. As a result, owners are more careful to whom they let contracts for their buildings, and a Bradstreet report on the standing of a contractor can be considered in giving credit. In fact the practice in

both places is to have work done on a percentage basis, which insures good work, or at least the work the owner is willing to pay for, and justice to every one.

There is probably no place in the United States where competition is more keen than in California, in all lines of the building business. Our laws really encourage new contractors in the field and these in turn lead mechanics in the various sub-contracting lines to make a start. The result is a wild scramble on the part of every one for **that** job, as if it were to be the last. The new beginners want a list of jobs to show, so if an established contractor wants to stay in the business, he must bid at cost or less and depend on "see-sawing" the sub-contractors to come out alive. The building business is an honorable calling, the one that makes our homes and demonstrates the prosperity and artistic taste of the community. Fortunes have been accumulated in the buildings we build, but there is not a contractor in San Francisco to-day that can say he has gained even a moderate fortune strictly at the contracting business. Nevertheless it is a calling that ever will exist and it is hoped that in the millenium, when competition dies, fortunes like are made in coal oil will come to the faithful builder.

SUB-CONTRACTOR.

* * *

Steel Railroad Cars

THE use of steel for the construction of railroad cars has advanced rapidly within the last few years; and for certain kinds of service—such as in tunnels and on elevated structures—the all-steel car is now generally recognized as the common standard. Whether steel will eventually take the place of wood for surface railways, yet remains to be seen; but it offers some very distinct advantages which cannot be lightly dismissed. The causes leading to the adoption of this style of car were probably tunnel accidents, which have in many cases resulted in disastrous fires in which wooden cars have been consumed. Many deaths have occurred from burning and smoke, which would have been avoided had the cars been built of incombustible material.

The first step in the construction was to make the sills and underframing of cars of steel, upon which a wooden superstructure was raised; but the all-steel car soon followed, and, in addition to its fireproof qualities, it is probably more durable and stronger than the wooden car. Another advantage which can be credited to the steel car is that it can be built lighter than the wooden car, and consequently there is less dead weight per passenger to be carried—which results in a corresponding diminution of the motive power required.—Technical World.

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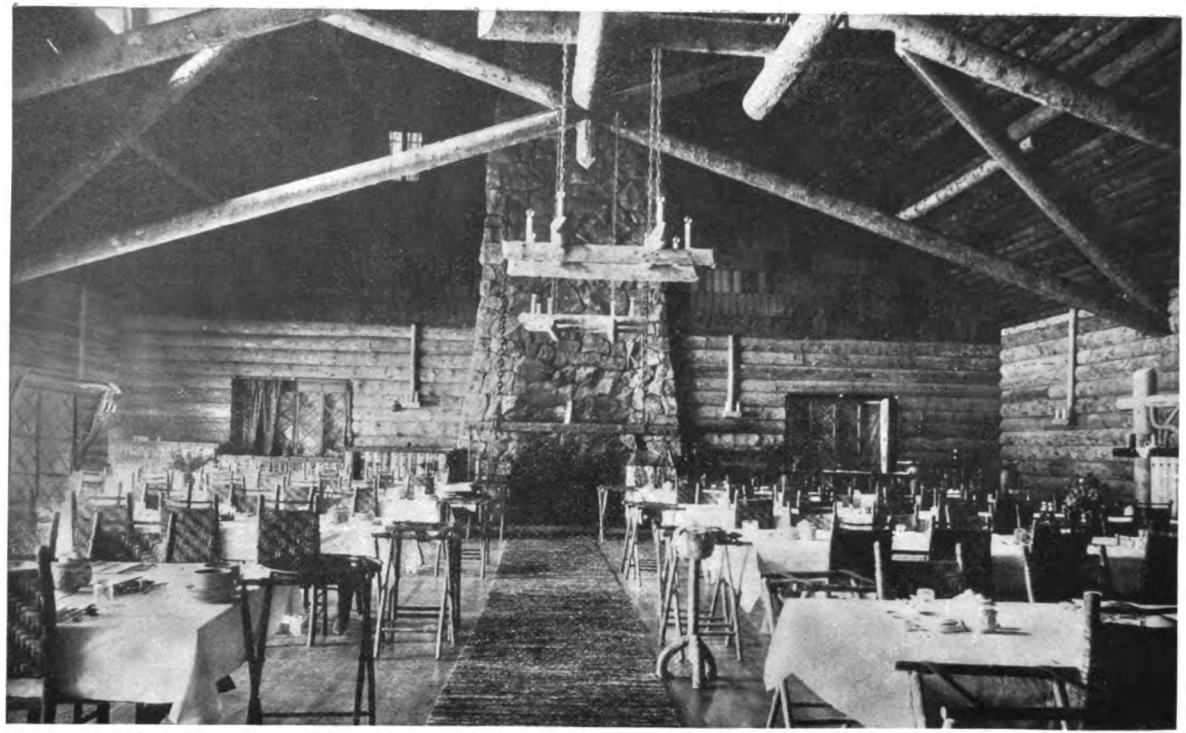
Anticipating to-morrow and regretting yesterday is the way some men divide their time.

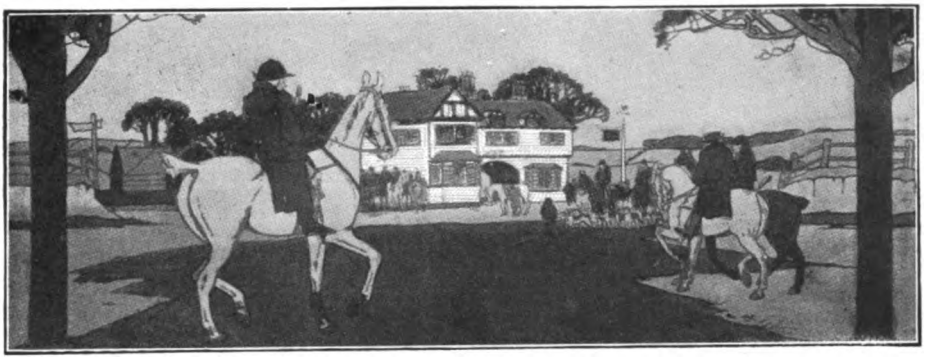
* * *

Experience is the best teacher; but sometimes—particularly in matters feminine—a fellow has to pay a pretty high price for his diploma.



Rustic Dining Room Showing Fire Place

C-311



Interior Decoration Up-to-Date Furnishing

Blue-and-White Rooms

By ELEANOR ALISON CUMMINS, in the House Beautiful

THE blue-and-white effect requires the exercise of an unerring instinct for color, an instinct not possessed by the average decorator or the average amateur; and it has limitations which are against its use except under certain conditions.

For the sunny rooms of a city house, or for almost any exposure in a seashore house occupied only in the months of brilliant sunshine, blue and white is ideal. Nothing is so dainty, nothing is so clean, nothing conveys the subtle sense of dignified simplicity quite so well as a good combination of blue and white.

In such a combination the white should avoid alike the suggestion of blue or of yellow. Milky best expresses the quality of the right tone. The blue should be an absolutely pure blue, free from the slightest suspicion of green—the blue of Royal Bonn or Owari china. When that has been said, three-fourths of the blue-and-white papers and fabrics are ruled out, for nothing is so hard to find as a blue wholly innocent of green. This all-persuasive green tinge may with justice be laid at the door of William Morris.

The ideal blue-and-white room is wainscoted, say four feet above the floor. All the woodwork is, of course, white, the floor a dark stained one, or else with a plain covering which may be wool filling or may be only blue denim. Above this wainscoting should be laid a paper in an elaborate scroll pattern of blue on a white ground, finished at the top with a white molding. Such a room, with furniture of mahogany or Flemish oak, with much silver and cut glass, would be delightful for a dining-room if it had a sunny exposure. If a blue-and-white rug in exact harmony with the paper cannot be found, an oriental one with dark blue and red is a tolerable substitute. Or

one might do worse than invest in white or gray goatskin rugs to lay on the blue filling. The mantelpiece may be carried above the shelf and paneled or set with a mirror, making a background for a little good blue china. There should be no pictures, no embroideries, only crisp and heavy linen covers on sideboard and serving-table. The shades should be white, and the curtains the straightest and simplest possible of clear white net or muslin.

Wainscoting is seldom practicable, and another method of breaking the too great expanse of wall-paper is to carry the white of the ceiling down on the side wall say two feet and a half. In place of a picture-molding, a four-inch shelf of wood may be used to support an occasional plate or jar, the blue and white of the china standing out well against the white of the frieze. Below this lay the blue-and-white paper. In a country house, the floor may well be left bare, and the furniture be of the simplest—ash, of good shape, bought "in the wood," and enameled white or black. Indeed, a judicious use of black has been the saving of many a blue-and-white room.

In choosing the paper for a dining-room, due regard must, of course, be had to the china which is to form, if not the decoration, the service of the room. If this is Canton china, a different treatment is possible. It is possible to find an ingrain paper in a blue harmonizing with the grayish tint of the china. Against this ground, engravings or etchings may be hung in the simplest of mahogany or ebonized frames. A blue room was once papered with Michelet charcoal paper, at a cost not much greater than that of cartridge paper. The man who used it hung his pictures so cleverly that the too frequent joinings were scarcely distinguishable, and the color and surface of the wall were delightful.

It sometimes happens that a room is abnormally high, or appears so through some defect of proportion. Very often this is the case with the rooms of first floor apartments. A good expedient is to have a two-foot frieze of a lighter shade of the blue of the figured wall-paper. This may be of cartridge paper, possibly of denim or unbleached muslin, stretched over the space, sized and painted. Again, a narrow shelf may take the place of a picture-molding.

In adapting these methods of treatment to bed-rooms, a good many variations are admissible. In the first place, the height of a bedroom rarely admits of a frieze, and even borders are seldom used. Again, the furniture of a bedroom breaks the wall space more, so the walls may well be entirely covered with a figured paper, preferably lighter in effect than that used for the dining-room. Few pictures should be used on a figured wall.

For the floor, nothing is better than white matting and white fur rugs, unless one has a blue-and-white cotton rag rug woven. The almost universal white iron bed is exactly suited to the blue-and-white room, but its more pretentious sister of brass should be rigorously excluded. Other furniture may be of white enamel, but a bureau of mahogany or other dark wood is much more effective. Table-covers, couch-covers, and the upholstery of a couch in blue denim or heavy linen are more effective than those of figured material. The plain couch covering is a good background for the embroidered pillows which the owner of the room is sure to accumulate. Sometimes the plain material is carried up on the wall behind the couch to a height of two or three feet, making a background for small pictures or bits of plaster. The same thing may be done with the mantel, though the best thing for that position is a mirror in a white frame.

The blue-and-white bedroom is the place of all places for embroidered curtains, covers, and bed-spread, worked in blue, on heavy linen. A clever needlewoman might adapt the floral forms of the wall-paper to this purpose.

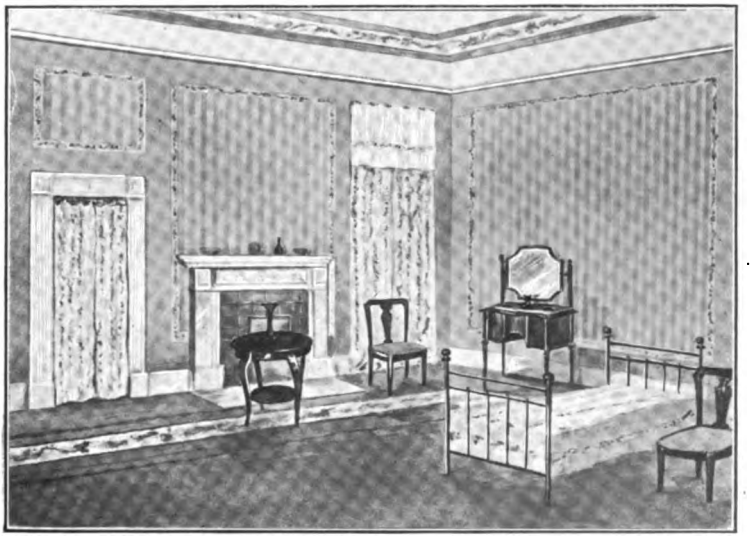
The charm of the blue-and-white bed-room is that it gives one such a good excuse for ransacking the Japanese shops for dainty bits of china for dressing-table, desk, and washstand, and for cotton fabrics for pillows. Only once in a while will the right blue he found, almost never in the white crepe with blue figures, but diligent search is sometimes rewarded by a crepe with white figures on a soft blue ground. Of blue china there is no end. One thing only is almost impossible to get, a comb and brush tray. It may, however, be imported at moderate cost, but the operation requires several months for its completion.

While blue china is, of course, the suitable accompaniment to the blue-and-white room, it is a fact that the blue-and-white room is not the best setting for blue china. So if one's collection of china is of real artistic worth, entitled to consideration in itself, he will seek another background for it.

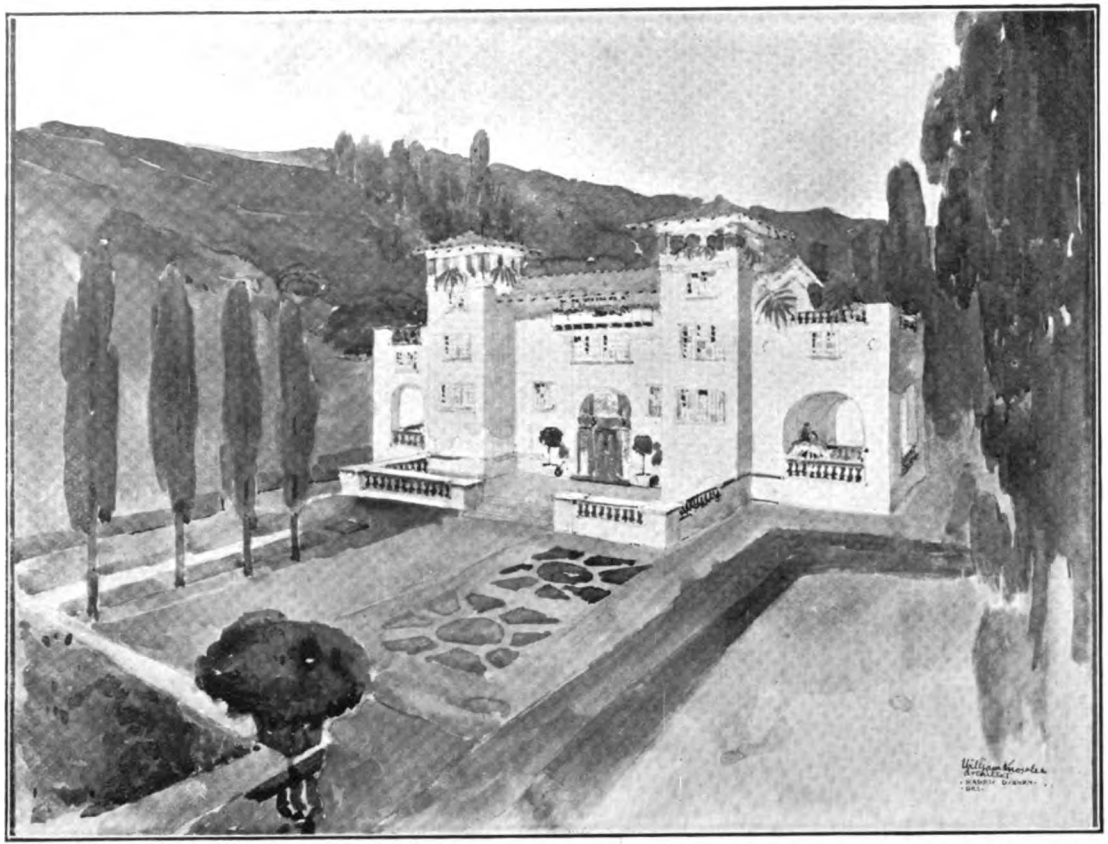
Out of all possible rooms for the display of china, one would, of course, choose a chamber paneled with old oak, either black with age or stained to the Flemish tint. But as such a room is unattainable to most people, they are forced to content themselves with the possibilities offered by paint and paper.

It goes without saying that the wall surface should be as nearly plain as possible, preferably of cartridge paper or painted burlap, and dark woodwork is always to be chosen. As to the color of the walls, either a dull green or a brilliant yellow is the best background for blue china. There are some russet-browns that bring out blue admirably, but they are most successful when the blue tones are in the minority, used simply as a high light in a dark color scheme.

The contrast of pure brilliant yellow and pure blue is a beautiful one if well managed, but it takes courage to select a sufficiently bright and deep yellow. Everything else in the room must be as dull and somber as possible. The darkest and soberest of oriental rugs should cover the floor, the furniture should be of Flemish oak. The yellow wall is a good background for engravings, old prints preferably, framed, without much margin, in black. Such a room, for all its dark coloring and heavy furniture, is never dull.

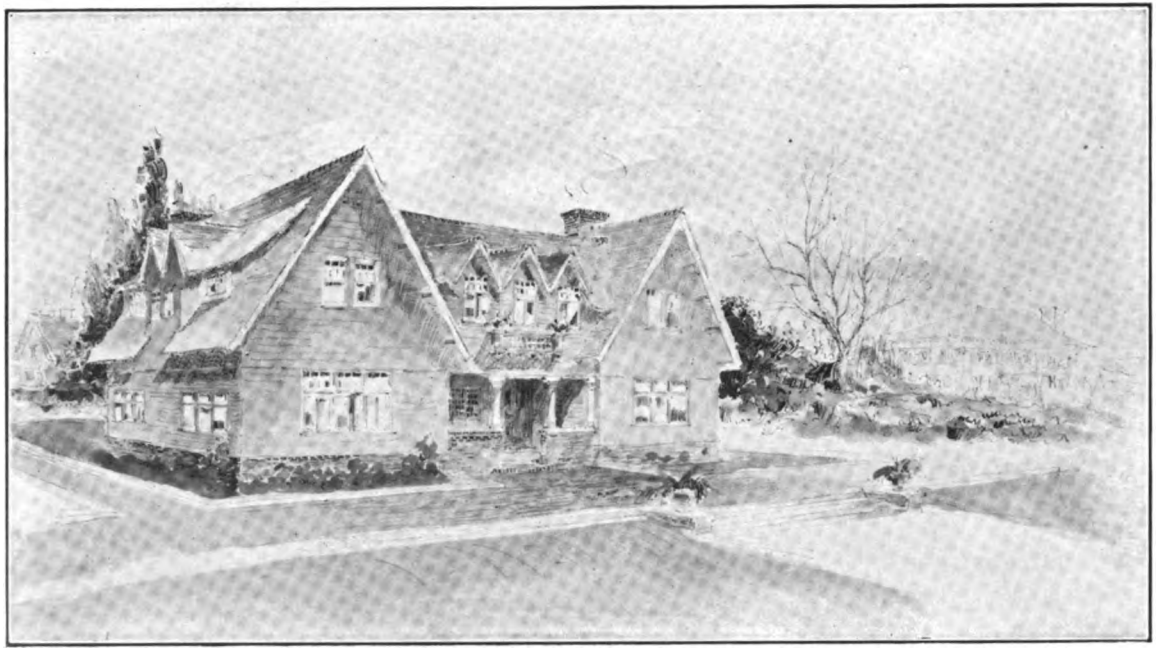


A Panel Suggestion for Bedroom *By L. Tozer & Son Company* C-312

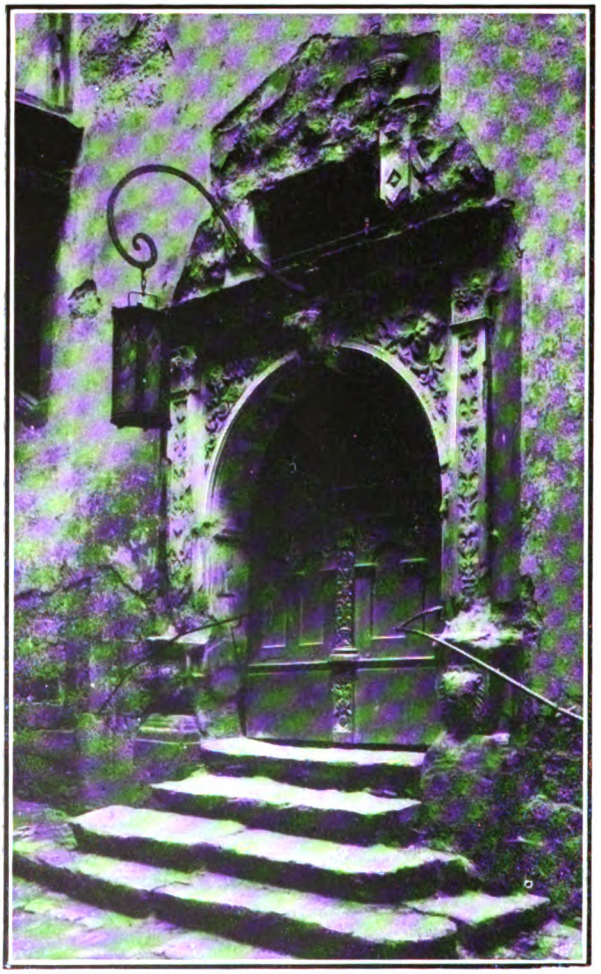


Design for Club House

William Knowles, Architect C-313



Design for Piedmont Home *William Knowles, Architect* C-314



An Artistic Doorway C-315

Taste in Interior Decoration

THE great requirement in household furnishings is taste. It is, of course, thoroughly delightful to have as much money to spend on a house as one wishes to, and to be indifferent, so far as the money goes, as to how much is spent; but it is much more important, as to results, to have only good things, disposed in a good way, charming wall papers, refined ornaments, exquisite combinations. These are the elements which go to make an artistic interior, not the mere amount of money paid for them.

The price of an article is no criterion of its merit, except that high priced articles should have greater art value than low priced goods. Art, real art, is costly, because much time and effort goes into its production. The genuine artist works slowly; if he belongs to the first rank he will produce but one or two masterpieces a year, perhaps not more than one in several years. He will use costly raw materials, because he knows his use of them will result in a fine production. He will apply to his task the knowledge and experience gained by many years of effort, possibly years of unremunerative effort. And in the meanwhile he has lived and must live, and he expects to be recouped for his expenses. All these things make his prices large, although his profits may be very small.

On general grounds, therefore, good art is expensive. So also is bad art. Very high prices are often charged for very bad objects, and, which is very much worse, obtained for them. The result is much more disastrous than being simply a bad purchase, for many people are fascinated by high prices, and will pay large sums for false works of art which not only have no right place in a house, but which destroy the effect of whatever symmetry and harmony and beauty may have been obtained by artistic effort.

Nothing so completely destroys the effect of any room so much as the introduction of a gaudy, conspicuous, inartistic object which has no right place in any well designed and artistically arranged home. It is bad enough when such things are given to one; it is scarcely short of a crime to deliberately purchase them under the singular notion that something of genuine art value is being obtained. It is bad in every sense. It shows that the possessor has no real taste herself, and it encourages the production of fake art objects, which would quickly disappear from the shops were there no market for them.

Any one with good taste can accomplish very much more in household decoration than one who simply has money to spend. Such a person gives thought and care to the problems presented in the household scheme. She realizes the value of every individual object, and if she starts fresh, can produce effects in beauty that the most lavish expenditure will fail to produce. And it is good taste which accomplishes this result, not money.—Exchange.

* * *

The (W)hole Cheese

Little Billy came in one afternoon from an assembly of the children of the neighborhood, with his clothes pierced above and below with a great many holes. "For pity's sake!" exclaimed his mother. "What has happened to you?" "Oh," said Billy, "we've only been playing grocery store, and everybody was something in it. I was the Swiss Cheese."—Detroit Tribune.

The Dangers of Cheap Houses

THAT cheap houses, cheaply built, are real sources of danger from a constructional standpoint, is widely and universally admitted; it is, perhaps, less generally recognized that grave sanitary dangers may result from improper construction, hardly less injurious to human life than a wall that will not stay erect, or a floor that will not support the load put upon it.

The builder who builds in a cheap way stops at nothing whatever to accomplish what, to him, is an economy. If he is not indifferent to life, it is because he knows that the responsibility can readily be brought back to him if his building falls down. If his construction is sound it is only because he is afraid to make it otherwise. He knows, moreover, that most people look more at the things they see than seek for what they can not see. If the walls appear strong and good, he trusts to inefficient work in the hidden parts, careless of what may happen several years after he has ceased connection with the work. Often enough he excuses himself on the ground that his contracts do not yield enough to permit good work, and that he must himself get out as best he can.

He may, for example, place his water supply pipe and his waste pipes so closely in juxtaposition that leaks in the latter may contaminate the water in the former. Both are safely covered up, so why should he care? Nothing may happen; and if it does it may be several years hence, when there may be no house at all; for such dwellings are not built to last long. The plaster may be mixed with substances filled with disease germs and no care whatever taken as to their origin. The bricks may be porous, admitting the external air. Chimneys so built rapidly accumulate soot, which, being damp, falls down when an extra hot fire is set going, and the dangerous fumes of carbon-dioxide and other gases are generated. Drains have been known to be connected with chimneys, admitting poisonous gases to rooms when there is no fire to carry them off. Discharge pipes for the conveyance of sewer gas may not be carried to the regulation height above the building, and chimneys may be so constructed as to be quite inadequate for sufficient draft. Arrangements for ventilation are often completely ignored, and the laws governing the cubic contents of sleeping-rooms are often evaded even in cities which maintain an expensive building inspection department.

In a general sense any one of these things, and sometimes others, are likely to happen where cheapness of construction is the single purpose of the building being erected. Advantage is taken of the ignorance of the public of such matters and to the indifference of the authorities to improper construction. It is much more difficult to evade the requirements of the building law in cities, where the rules are strict and the inspection apparently rigorous, than in rural communities where there is neither law nor inspection. It is a matter difficult to remedy, for betterment can only result from a wider acquaintance of the requirements of good building, and the necessity for good building, than exists at present.

* * *

It is easier to get into public life than to stay there.

* * *

After all, when it rains, it settles the dust; and when the sun shines, it dries up the mud.

Heating, Lighting and Electrical Work

What is Heating and Ventilation?

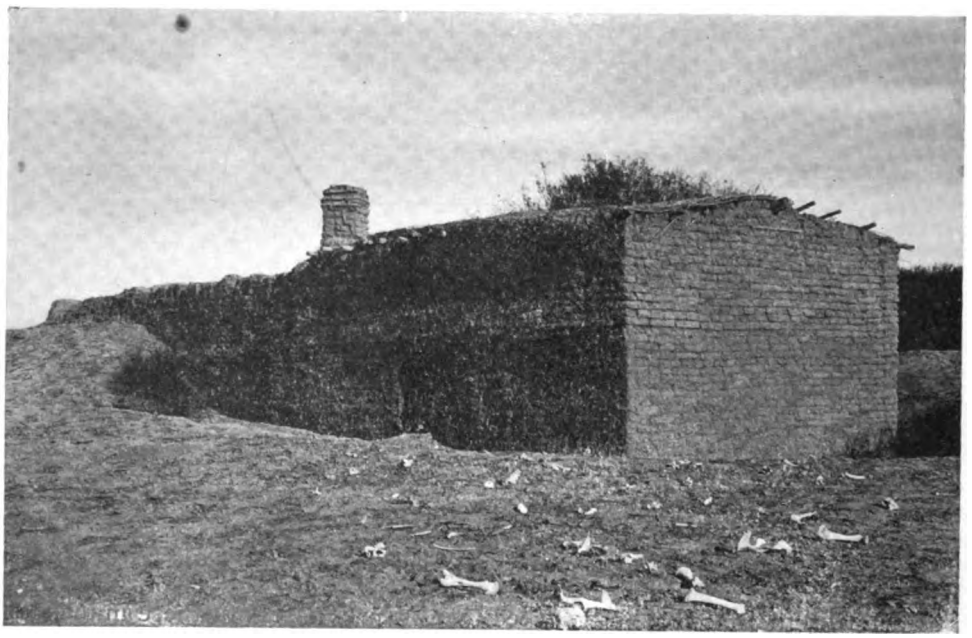
By F. H. BRYANT

METHODS of Heating. In the progress of civilization more efficient arrangements for heating have gradually been adopted. Fire-places, stoves and furnaces have, been introduced as means of warming. For small rooms, as in dwellings, they answer very well; but the effect of opening or closing windows and doors and of changes in the atmospheric conditions is too well appreciated to need recital. It will certainly be admitted that a building can seldom be found where the heated air is **properly** and **satisfactorily** furnished and distributed by a furnace; some of these influences are sure to act, and at times it will be impossible to heat certain rooms without the closing of doors or shutting of registers in other rooms.

More refined are the methods of heating which are dependent upon the use of steam or hot water, confined in radiators or coils. Under systems of direct radiation, these are placed in the rooms to be heated, but seldom with any provision for the introduction of fresh air. By the indirect method of placing the heating surface in ducts connecting with the rooms and permitting outdoor air to pass across such surfaces, a much nearer approach is made to good ventilation. But still it is practically impossible by such means alone to produce the air-flow and maintain the temperature necessary for a large and crowded apartment. It is evident that some positive means, like the fan, must be applied to render such systems reliable at all times.

Ventilation and Heating Combined. Experience has clearly demonstrated that in this climate no system of ventilation can be successfully operated by itself and independently of the method of heating that may be adopted. It is, in fact, a vital element of success that the two systems be most intimately combined, for they are clearly interdependent, and when properly applied are so interwoven in their operation and results that disunion is certain to bring about failure

For the purpose of ventilation, the fan was first applied upon a practical scale about the middle of this century, but only to a limited extent, and it was not until the fan and the steam heater in marketable form were introduced that the so-called "Blower System" became a reality. This system is at once practical, successful and economical; for, air being the natural conveyor of heat, it may, when properly warmed and supplied, perform the double office of heating and ventilating. As applied, the "Blower System" forces the air into the apartment by the pressure of **plenum method.** When a fan **is** arranged to exhaust or withdraw the air from an inclosed space, the term **vacuum, or exhaust method,** is almost universally applied.



An Early Architectural Endeavor in Need of Restoration C-288

Accepted Design for New School Building, Berkeley *William H. Warff, Architect.* C-289

Among the Architects

Information contained in this publication is gathered from the most reliable sources accessible, but to make it absolutely accurate the publishers urge the co-operation of the members of the profession :: :: ::

BUILDING REPORTS.

Hotel, Berkeley. For a new $300,000 family hotel, which is to be built by a syndicate of wealthy Alameda County capitalists at Claremont, Berkeley, the following architects are preparing competitive plans: Bliss & Faville, Myers & Ward, William Knowles, all of San Francisco; C. W. Dickey, Oakland, and John G. Howard, Berkeley.

Fraternal building, Petaluma. M. Doyle, a prominent Elk of Petaluma, has agreed to put up a substantial building for use of the Elks. Members of the association include W. J. Palmer, P. Sweed, Thomas Maclay and A. L. Jones.

Store building, corner Putnam and Pomona streets, Fruitvale. Architect, C. W. Cook, Oakland. Owner, William Cron, corner 5th avenue and East 18th street, East Oakland. The building will be 55x60 feet and will contain three stores; supports strong enough to carry two additional stories, if desired; Malthoid roof.

Business block, north corner of Howard and Eighth streets, San Francisco. Architect, E. E. Young, San Francisco. Owner, Joseph Sloss. Plans for a substantial structure, to occupy this corner, are now under way. The lot where the building is to be erected has never been built on, the only use it was ever put to being for bill boards. The new building will probably cost $100,000 and will be of brick and steel.

Steel and brick building, Hanford, California. Architect, S. T. French. Owner, Sam Relioefer, Hanford, California. Cost, $17,000. Excavations are now being made.

Bank building, San Jose. The First National Bank of San Jose is having plans made for either a five or eight story building, to be built at the corner of First and Santa Clara streets and to cost in the vicinity of $125,000. The building will probably be of brick, stone and terra cotta. No architect has been selected as yet. For additional particulars see J. D. Radford, president of the bank.

Alterations and addition—Northeast corner of Stockton street and Union Square avenue. Architects, Cunningham & Politeo, San Francisco. Cost, $40,000. Owner, Schroth Estate. One story is to be added to the building, which is known as the Stockton Hotel. The building is to be altered into a modern office structure.

Eight story building, Kearny street and Hardy place, San Francisco. Architects, Meyer & O'Brien, Crossley building, San Francisco. Cost, $120,000. Owner, F. W. Marston, 2714 Sacramento street, San Francisco. Bids are now being taken for this building, which has been previously described in these reports.

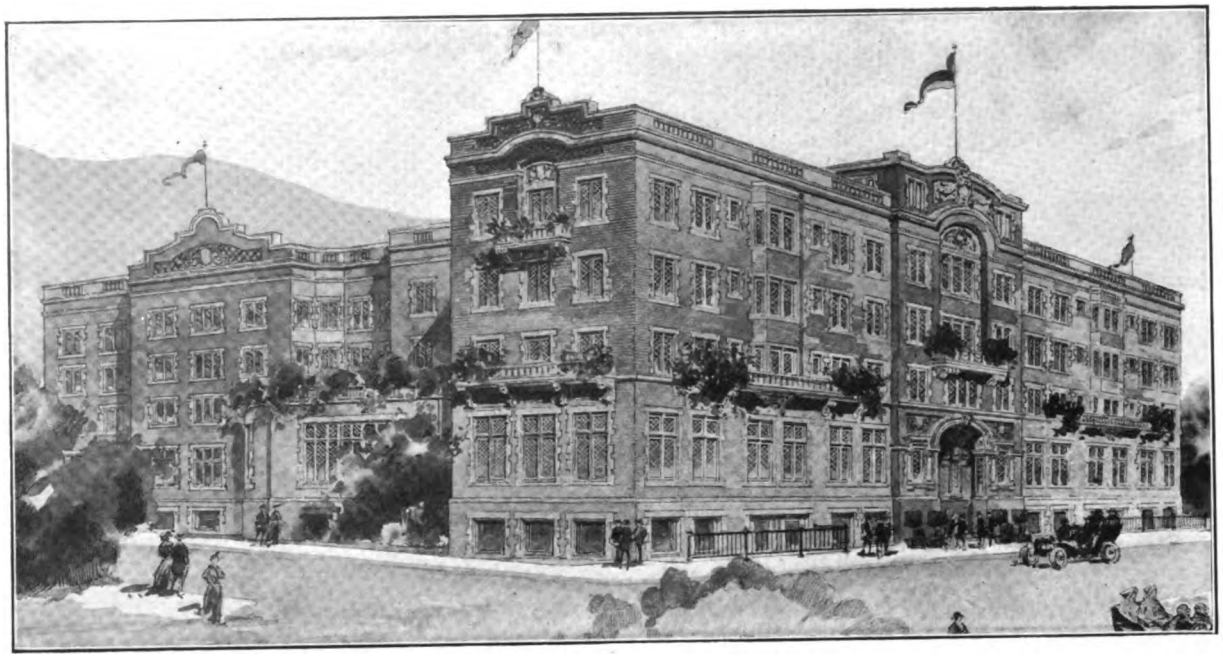
Native Sons' Hall, San Jose. The Native Sons of San Jose have bought a lot on Second street and will erect a $30,000 building similar to the Native Sons' Hall in San Francisco. See C. T. O'Connell, Chairman of the Board of Trustees, San Jose.

French flat, Hayes street, San Francisco. Architect, Henry Shermund, San Francisco. Cost, $25,000. Owner, Mrs. Ella M. Leigh, San Francisco. The flat will contain fourteen apartments, all finished in an up-to-date manner.

Bixby Hotel, Long Beach, California. Architects, Austin & Brown. Seven stories, reinforced concrete, tile roof, 300 bedrooms, 100 private baths, 20-foot porch around entire building, open pergola on roof, steam heat, marble and scagliola work; bakery and ice plant, laundry and two observation towers 120 feet high. Cost, $300,000.

Brick building, north side of Market street, near Franklin, San Francisco. Owners, A. S. MacDonald and C. O. G. Miller. Architect not yet selected. The building will be 27:6x110 feet and four or five stories. For further particulars see Thomas Magee Sons.

Seven story and basement brick building, north side of Golden Gate avenue, west of Taylor street. Architect, Shea & Shea. Owner, M. Siminoff. Cost, $54,000. Contract has been let.



Design for Tourist Hotel Berkeley

John Galen Howard, Architect **C-290**

School houses, San Francisco. Architects, Shea & Shea. Plans for the new Bergerot and Monroe schools have just been completed. The former is to be a twelve-room brick structure costing $80,000, while the latter will be of wood, with eight class-rooms and will cost $40,000. Figures will be taken after the plans have been approved by the School Board at its next meeting.

Flats, San Francisco. Owner, Dr. George K. Flint. Cost, $10,000. Dr. Flint will move the old Washington school from its present location and rebuild the structure into modern flats.

Alterations and addition—Corner of Fremont and Market streets, San Francisco. Architects, Cunningham & Politeo, San Francisco. Cost, $150,000. Owner, Lachmann Estate. The present building is five stories and used for storage purposes. It is to be transferred into an up-to-date office building and raised two stories. Three first-class elevators are to be installed, interior entirely refitted, scagliola, tile work, etc.

Hotel, Geary street, San Francisco. Architects, Cunningham & Politeo, San Francisco. Cost, $180,000. Owners, Charles and Margaret Stewart, San Francisco. The plans are now ready for figures and call for a seven story building, either of brick and terra cotta, or of sandstone, marble and tile work, two elevators, steel frame, fireproof appliances, etc.

Hotel, East street, between Mission and Howard streets, San Francisco. Architects, Cunningham & Politeo, San Francisco. Cost, $70,000. Owners, East Street Improvement Company. The buildng is to be of brick and terra cotta, six stories, 110 rooms, elevator, etc.

Carnegie Library, San Rafael. Architects, Reed Bros., Call Building, San Francisco. Cost, $50,000. Reed Bros. have had their plans accepted for the new Carnegie Library at San Rafael. Building is to be of stone.

Residence, San Rafael. Architect, Maxwell G. Bugbee, 330 Pine street, San Francisco. Cost, $5,000. Owner, name withheld for present. Plans for a handsome two-story shingle residence are now being made.

Residences, Ross Valley. Architect, Maxwell G. Bugbee, 330 Pine street, San Francisco. Cost, $3,000 each. Plans for two houses to be built by Messrs. Stratford and Beanston at Ross Valley will be ready for figures in another week.

Hotel, Berkeley. Architect, John Galen Howard, Italian-American Bank Building, San Francisco. Cost, $200,000. Owners, Syndicate (See Mr. Howard). Plans have just been competed for a five-story hostelry to be built of brick and terra cotta; fireproof; 200 rooms; first-class interior finish. It is to be a tourist hotel.

Six story loft building, Jackson street, San Francisco. Architects, Cunningham & Polieto. Cost, $50,000. Owner, Golden Gate Company. Bids are now being taken for this building, reference to which was made in these reports last month. The building is to be of brick and iron, 40 by 120 feet, and there will be stores on the ground floor and lofts above.

Masonic Building, Palo Alto. Architect, H. F. Starbuck, 206 Sansome street, San Francisco. Cost, $50,000. Owners, Masonic Temple Association of Palo Alto. Detailed plans for this building have just been finished, and as soon as approved by the Committee bids will be taken. Building is to be three stories; brick and stone; elevator; composition roof; galvanized iron cornice; scagliola, etc.

New work in the office of Architect T. J. Welsh includes additions and changes to the Sacred Heart Church, Fell and Fillmore streets, San Francisco, to cost $50,000. Colonial residence for Geo. H. Sharper, in San Mateo Park, to cost $12,000; three cottages, to cost $6,000, at Larkspur, for J. Costello, of the firm of Moffit & O'Connor, and a country residence for J. Hoey, at San Anselmo.

* * *

Cement in South Africa.

It may be of interest to some readers to learn that there is a fair prospect of manufacturing Portland cement, of the highest grade, to the British standard specification, in the South African colonies. An old-established Portland cement manufactory in England has succeeded in finding deposits of the necessary raw materials lying in close proximity to each other in the neighborhood of Kroonstad in the Orange River Colony and on the main line of railway from Bloemfontein to Johannesburg, and it is intended to erect works there. The importance and value of manufacturing Portland cement in the South African colonies has long been known, but up to the present, the necessary raw materials for producing first-class Portland cement have not been found in proximity to each other nor in suitable positions for cheap transit. A recent trade conference held at Bloemfontein, recognizing the importance to the colony for establishing the manufacture of Portland cement, recommended the Orange River Colony Government to offer a bounty to the first works established. It is stated in reference to the foregoing that the sea transit and railway carriage from the coast to Johannesburg amount to four times the prime cost of Portland cement in England.

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EDITORIAL

THE NATIONAL SCHOOL OF ARCHITECTURE.

A movement that promises to be of great and permanent value is being fostered by the Society of Beaux Arts Architects of New York. The society proposes to establish at New York the National School of Architecture. In the formation of this school it is desired to secure the co-operation of the educational institutions throughout the country to aid in the better education of architectural students, both those who can devote their whole time to study and those who, being employed during the day, have only the evening for instruction. The interest and help already given the efforts of the society in the past by prominent institutions encourage the officers to include the entire country in their plans for architectural instruction under such conditions as shall result in a more general and thorough education of architectural draftsmen.

In this connection, says the "Inland Architect and News Record," it is of especial interest to note that the Royal Institute of British Architects is enlisting the aid of universities of England to extend to the country at large the benefit of their great facilities in advancing the cause of architectural education. The Board of Architectural education of the Royal Institute of British Architects has secured the co-operation of many institutions which are represented on the Board.

Such a school as that proposed by the Society of Beaux Arts Architects must be necessarily broad and liberal in scope. It should have the utmost help, not only of educational institutions, but of architects and all interested in the betterment of art and architecture. The Society of Beaux Arts Architects has shown itself well qualified to inaugurate such a school with every promise of success. It has been for years a powerful factor in architectural education, especially in the East.

It has given without stint of the

time and means of its members to promote and encourage more thorough training and higher ideals among students of architecture. From a small beginning a dozen years ago the growth of this part of the society's work has been constant from year to year. Each year a little more has been attempted than before, and so carefully and wisely have the plans been laid that each step has been forward. It is to be hoped that even a greater measure of success awaits the crowning ambition of the society; the permanent establishment of the National School of Architecture.

* *

FIREPROOF CONSTRUCTION IN THE HOME.

The question of fireproof construction in private dwellings is receiving unusual attention throughout the United States. There are a number of reasons for this. Owners of country homes find that by making their houses as near fireproof as possible their insurance rate is reduced to a minimum. Again, it has been shown that a house built to resist the flames costs no more, in fact, oftentimes not as much, as a building susceptible to fire. Both steel and concrete, it would appear, are destined to cut a considerable figure in the construction of future residences of any pretention.

It is a good sign of the times, says an exchange, that the question of fire protection is receiving very wide attention. In the last few years the United States has been visited by a series of disastrous fires, which have been so extensive as to make the terms "Baltimore fire," "Patterson fire," "Rochester fire" and others both descriptive and definite.

These great conflagrations, however, by no means sum up the total fire loss in this country, which, for many years, has averaged millions of dollars in the value of property destroyed, and many more millions in the injury they bring to business and the personal losses they entail which can scarcely ever be estimated in total amounts. But it has been the great fires, like that of Baltimore, which have concentrated public attention on this very important subject. The sweeping away of an entire business section of a great city was a national calamity, and the wider public, which had not hitherto concerned itself with fire losses and their morals, was rudely awakened to the realities of a very great danger.

The buildings that have been destroyed have been of the old type, which made no pretense to fireproofing. The buildings that survived have been those built in accordance with scientific ideas of fire protection in the structure itself. Let it be granted, if you will, that this protection is but relative, it has a positive value which much recent experience has shown to be of the highest practical utility.

The time is not far distant when this system is also applied to the private dwelling. The demands for this are already loud, and a number of costly houses have been built in the last few years that are actually fireproof in the insurance meaning of the term. Such an extension of fireproof construction will mean much for the safety of lives and property in our big cities.

The isolated country home is practically without fire protection. Certainly it is without vigilant watchmen and trained fire fighters, and the interests of the owner would seem to demand something more than even slow burning construction. Not only his property but the lives of his family and dependents are at stake. For instance, they used to call the gasoline stove the "undertaker's friend" in some Eastern communities, and it needed more than slow burning construction to make the best of these country necessities fireproof. The slow-burning properties of California redwood have saved thousands of lives, but it is not fair to ask too much of Providence even aided by Redwood.

Modern methods of construction should be used, and though the same may cost more the additional outlay will more than be offset by the protection afforded from fire losses.

The Publisher's Corner

The Windsor California Pottery and Terra Cotta Company began the new year by starting up its new Bonner machine, which has a capacity of turning out 75,000 hollow blocks a day. The company has taken up this new line of industry in response to an urgent demand from the building trade. It is claimed of the hollow block that it absorbs moisture and is therefore damp proof and for inside lining has been pronounced superior to solid brick. Among the first buildings to be supplied with the new article will be the addition to the Chronicle building now under construction.

The company has also very recently installed a 200-horse power Parker boiler, which is the only one of the kind in Alameda County. Besides a substantial addition for the accommodation of the boiler and other new machinery the company has just finished the erection of three clay towers, having a storage capacity of 100 tons each. Still another important addition to the company's plant is a new flower-pot machine with a capacity of 10,000 per day.

During the past year the Windsor California Pottery and Terra Cotta Company has filled orders aggregating $100,000. Among the important contracts now on hand is the patent chimneys for the Fairmont Hotel, flues for the Fort Barry Barracks at Prescott, Arizona, and the hollow brick for the Chronicle building.

The company's main office and factory is at the corner of East Twelfth and Park streets, Oakland, with a branch office at 10 Larkin street, San Francisco. Mr. Serril Windsor, head of the company, says the future for his concern was never more promising. He looks for a record-breaking year, from a business standpoint.