THE ARCHITECT AND ENGINEER of California and Pacific Coast States

MAY 1910

FEATURES

The Work of Crim & Scott, Architects

Some Attractive Interiors in Hardwood Veneer

Designs for Country School Houses

A Concrete House with Untreated Surface

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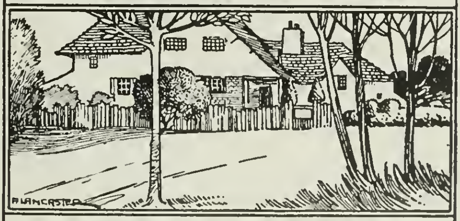

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Crim & Scott, Architects

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THE

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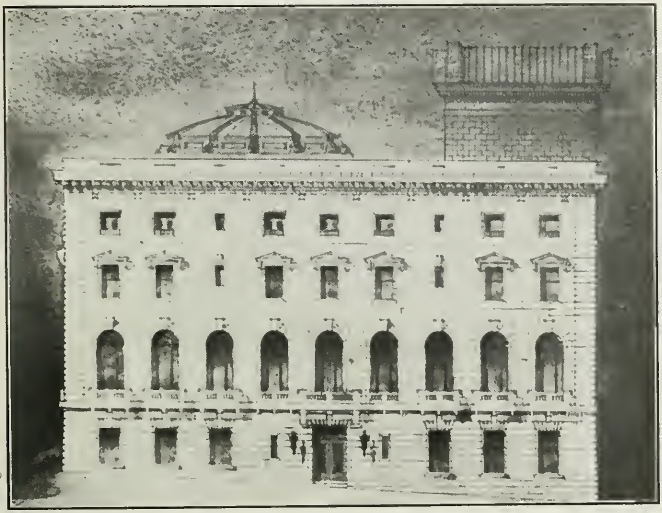
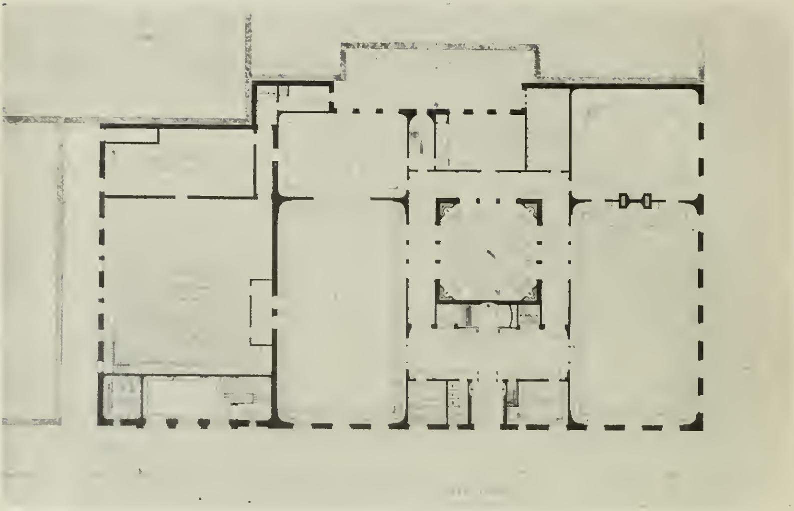


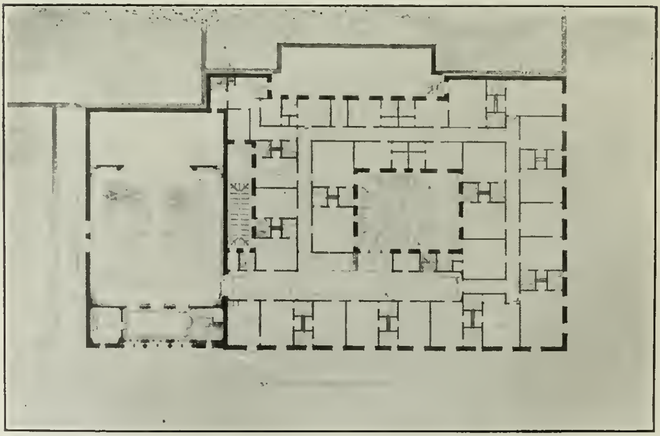
Post Street Facade, Competitive Design for Bohemian Club Building, San Francisco
Crim & Scott, Architects

Some of the Work of Wm. H. Crim, Jr. and Earl B. Scott, Architects

FOLLOWING the rebuilding of the financial and business sections of San Francisco, has come a demand for apartment houses, flats and residences, and right now building activity is centered in this latter class of construction. The apartment house district is the last to be rebuilt, and another year will probably see that part of the city as thickly settled as it was before the big fire four years ago. Architects who specialize in apartment house and flat building construction are naturally busy. Messrs. William H. Crim, Jr., and Earl B. Scott, whose work is shown in this number of the Architect and Engineer, have been very successful in designing apartment buildings of moderate cost, say from $15,000 to $40,000, with from four to twenty apartments to a building, each flat being a complete home in itself. No particular style is followed by this firm, although the majority of their buildings have a tendency to the Colonial. The Mission or Spanish order is also followed, a splendid example being found in the new Mission Savings bank building, at Sixteenth and Valencia Streets.



First Floor Plan, Bohemian Club Building, San Francisco



Second Floor Plan, Competitive Design for Bohemian Club Building
Crim & Scott, Architects

The New
Mission Savings
Bank, San Francisco

Crim & Scott, Architects

Landry C. Babin Building, San Francisco
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Marathon Apartments, San Francisco
Crim & Scott, Architects

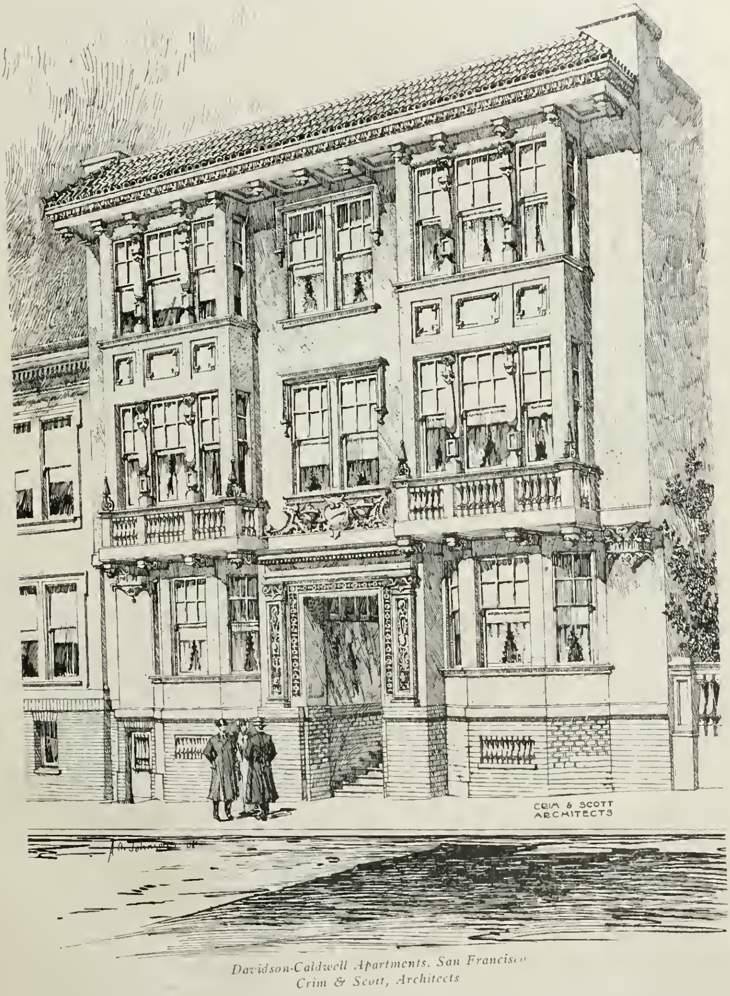
The Brae Apartments, San Francisco

Brutcher & Serna, Builders

Crim & Scott, Architects

Store Building for Taylor Estate, San Francisco
Crim & Scott, Architects

Grant Building, San Francisco
Crim & Scott, Architects



Davidson-Caldwell Apartments, San Francisco
Crim & Scott, Architects

Apartment Flats for Mr. Joseph Cumming, San Francisco

Crim & Scott, Architects

Building for Lillora Canfield, Chinotown, San Francisco

Crim & Scott, Architects

Hotel for Mr. William J. Gillespie, Redding, Cal.
Crim & Scott, Architects

Apartment Flats and Stores for Ramacciotti & Byrne
Jacob Witzelsberger, Builder *Crim & Scott, Architects*

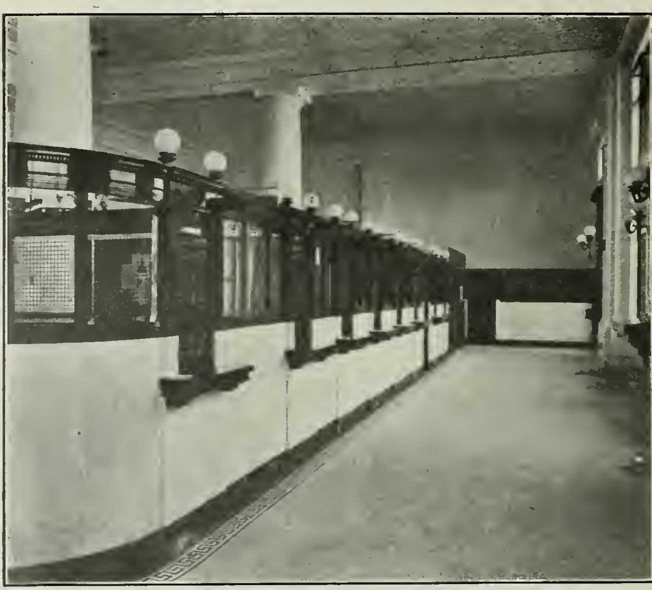
Flats for Dr. Thomas E. Shumate, San Francisco
Crim & Scott, Architects

Flat Building for Mr. Matthew Smith, San Francisco
Crim & Scott, Architects

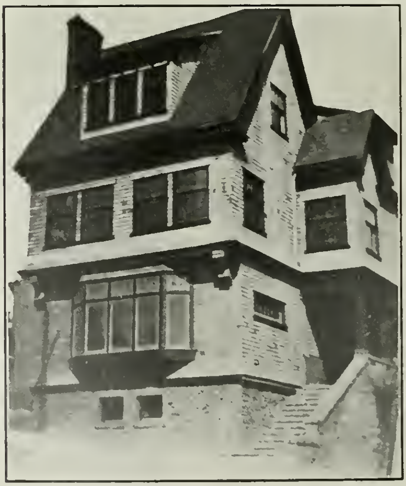
The Laurel Apartments, San Francisco
John Tschabold, Painter *Crim & Scott, Architects* *Wallace C. Boswall, Contractor*
The frame of this building was eercted in twelve days

In the Bohemian Club competition the design of Messrs. Crim and Scott was awarded second prize, the first prize going to Loring P. Rixford. The Crim and Scott plan is a most attractive one, embodying many features of merit which appealed very strongly to the committee. It was only after long deliberation that the Rixford plan was selected in preference to the Crim and Scott design. Two elevations and as many floor plans are published in this article and they give a fair idea of the scheme and general style worked out by the architects.

Messrs. Crim and Scott, although comparatively a young firm, having been associated in business less than five years, are natives of San Francisco, and are graduates of well known local offices. Mr. Crim studied under Willis Polk, with D. H. Burnham & Co., and Henry Meyers, who succeeded Percy and Hamilton, while Mr. Scott received the greater part of his schooling in the office of William Curlett. Both young men are members of the San Francisco Chapter, American Institute of Architects, and the San Francisco Architectural Club.



Banking Room of Old Mission Savings Bank, San Francisco
Crim & Scott, Architects



Rolph Residence,
San Francisco
Crim & Scott, Architects

Residence of Mayor George A. Merrill, Redwood City
Crim & Scott, Architects

Dining Room in Residence of Mayor George A. Merrill, Wellsley Park, Redwood City.
Crim & Scott, Architects

Residence of Mr. Grover C. Elam, San Francisco *Cunn & Scott, Architects*

Dining Room in Residence of Mr. Grover C. Elam

Drawing Room in Residence of Mr. Grover C. Elam

Den in Residence of Mr. Grover C. Elom

Concrete Residence of Mrs. Gaston Daus, Ocean City, N. J. *Grant M. Simon, Architect*

A Concrete House With Untreated Surface*

THE concrete house shown herewith, by courtesy of Cement Age, deserves to be termed notable because of its unusual exterior treatment, or, rather, entire absence of treatment. The house is the property of Mrs. Gaston Daus of Philadelphia, and was erected at Ocean City, N. J., from plans by Grant M. Simon of Philadelphia.

The dwelling is a double house planned so as to preserve the outlines and dignity of a large single dwelling without a sacrifice of privacy. It is thoroughly substantial throughout.

During the past few years there has been endless discussion concerning proper treatment of concrete surfaces. Volumes have been written and spoken on the subject, and methods of treating surfaces now range from projecting pebbles and stones that suggest a charge of grape-shot fired into a mud wall to painfully smooth and cold exteriors, devoid of life and texture. Between these extremes there are many methods in vogue, including sand-blasting, tool-dressing and the very simple and admirable process devised by Henry H. Quimby, Bridge Department Bureau of Surveys, Philadelphia, as applied to the bridges designed by him, which treatment merely consists of scrubbing walls after the initial set has taken place. This method is probably the most economical yet devised, and answers every purpose for massive masonry or bridges, where curved lines and balustrades are to be considered.

In the case of dwellings, however, the prediction is made that our best architects will, ere long, advocate an untreated exterior finish.

The prediction follows the conviction that, in future, untreated walls will not only be recognized as thoroughly typical of concrete construction, and hence a guarantee of structural integrity, but that they will have further value in offering greater resistance to moisture when the thin film of cement is undisturbed. With harmony established in the outlines and other architectural features of a building, a wall of this character will take its place as a durable, fireproof and altogether pleasing part of the house. A few years more, and a wall such as is shown in the accompanying pictures will, we believe, be accepted as a standard of excellence. As stated, its structural value is improved by the entire absence of artificial treatment, and the artist and architect will come to like it for its honesty and simplicity. Indeed, it is doubtful whether an architect of good taste would, if he could, have the walls of a house hewn out of four massive slabs of granite and set in position. But that is practically what takes place when a concrete wall is tool-dressed. All have seen the jig-saw cottage in the course of construction. There is something pleasing about the ugliest examples before the rough sheating is covered, especially when the latter has become weather-stained. Then follow the precise clapboards, fresh paint and scroll work, and the house ceases to have any esthetic merit. It is essential that this should happen to make the frame house habitable, but not because of any artistic reason.

With the untreated concrete wall there is evolved stability and weather-proof qualities, plus harmony in color and texture. As to the comparison of plain concrete with ordinary brick, stone and frame construction, the pictures of the Ocean City house show all these types in the background. The texture of the concrete house is certainly more pleasing than in those surrounding it. To sand-blast or tool-dress this house would cost $300 or $400, with nothing gained in the way of durability or impermeability. The latter would unquestionably have been impaired by this

*The publishers do not agree with all the statements made by the writer in Cement Age. We believe the exterior of a strictly reinforced concrete house or business structure can be made attractive and damp-proof only by the application of surface treatment or ornamentation. The seaside house, illustrated herewith, while presenting a substantial and rather inviting appearance, lacks the beauty that is possible only by surface treatment.—Ed.

Fig. I.—Detail View Showing Texture of Walls and Substantial Concrete Posts and Balustrade of Porch
(The large square posts are hollow, with drainage at the bottom, and will be utilized for plants)

Fig. II.—Front View of the House Showing Substantial Character of the Steps and Porch treatment. The plastic nature of the material would have been disguised, one of the pleasing attributes of concrete. To have plastered the walls would have resulted in surface cracks and ultimate falling off of the outer coating. In brief, it is difficult to see how any treatment could improve the appearance of the house unless in the direction of even more rude exterior finish obtained by the same natural and direct process, which could be accomplished by the use of rough, unmatched lumber. On this point the architect has stated that were he to build another house of this character he would seek to emphasize this quality.

Therefore, if an honest surface of this character is eventually accepted as entirely appropriate, it will introduce a great saving in time and money. It will mean cheaper lumber for forms. It will do away with outside plastering, tool-dressing and sand-blasting. It will dispense with the labor and anxiety attending effort to obtain special results in color and texture through carefully selected or exposed aggregates. A wet, dense concrete, carefully spaded, and substantial forms, will be the simple process substituted for more complex and costly methods.

But there is another feature of this house quite as important from the standpoint of economy and structural worth as the treatment of its exerior surface. It is the fact that the walls are solid and only six inches thick.

The condition of the walls under severe stress of weather indicates that hollow walls are not necessary, and that furring and plastering may be eliminated.

This is such a long step in the direction of economy as to be rather startling. Confronted with a vast deal of contradictory data on this subject, and in order to preclude possibility of moisture upon the inside, it was finally decided to furr and plaster the inside walls with the exception of the walls supporting the porch. These walls are exposed to the weather, as in the case of the plastered walls, but have undergone a more severe test, owing to the exposed ceiling, which is also the porch floor.

During all the storms of fall and winter, these walls, and likewise the ceiling above them, have failed to show the slightest trace of moisture upon the inside.

They are as dry as the furred and plastered walls. During construction, and before the final top coat was put on the porch, a pool of water, confined by rubbish, lay there for a long time. At no time did this water work its way through the unfinished but dense concrete floor, which is also the ceiling of the rooms below. Both rain and snow have fallen in the meantime, and no dampness has appeared. Thus there is reason to believe that even condensation will not take place. There is recalled the testimony of an architect on this point to the effect that he had dispensed with lath and plaster upon the inside of a 6-inch concrete wall and had put thereon a delicately tinted wall-paper which showed no signs of dampness or other injury after the expiration of six months. There is similar testimony in the case of a stable with 6-inch concrete walls, in which a fire has burned for hours in the harness room without condensation taking place on the concrete wall. This test has been made in extremely cold weather. The low heat conductivity of concrete has been established beyond any doubt, and there is evidence that cold will not penetrate it to the degree that brings about condensation. Poorly made and porous concrete is responsible for its bad name in that respect. Experiments relating to condensation would be well worthy the attention of the U. S. Structural Materials Laboratories. If it is shown that we may have no fear of condensation, and thus dispense with hollow walls and furring and plastering, we have achieved still greater economy in the construction of dwellings. As to

Fig. III.—Side and Rear View Showing Massive Chimney Construction and Interesting Treatment of Concrete Columns

Fig. IV.—View From Front Porch
Note strong and massive columns of concrete as compared with light timber construction of houses in the background

Fig. V.—Living Room Fireplace of Reinforced Concrete. The surface was left as it appeared when forms were removed

decoration of interior surfaces, the money saved by the simple process described would more than pay for materials of good quality and design. These could be applied to inside walls without special preparation of the surface. Doubtless, in many cases, owners would be satisfied with the plain concrete interior.

If, as stated, walls of this character are accepted as a standard type, as in the case of the more common type of brick and stone, there is no question as to the economy that will result from their adoption. From the artistic standpoint they offer suggestions for good design, as in this case, and should appeal to the architect, who, once they become general, will plan the entire house in harmony with the walls. In any event, to try the experiment does not prevent different treatment after the house is constructed. Plaster or tool-dressing may be applied at any time. We are convinced, however, that the latter methods will eventually be abandoned as non-essential from every standpoint.

The walls of the house are carried on concrete footings 2 feet wide and 12 inches deep. The footings are reinforced longitudinally and transversely with ½-inch square corrugated bars. At the top of the footing a recess was left to receive the wall. The outside forms for the wall were first erected and the window frames fastened in place. Then the inside forms were erected and the concrete poured. Forms were wired together at intervals of five feet in both directions. The concrete was placed one story at a time, but the work was not continuous. When necessary to stop over night, construction ceased at an angle, so as to avoid a vertical showing joint.

The walls were reinforced with ½-inch square corrugated bars, spaced 12 inches apart vertically and 2 feet horizontally. The vertical bars were left projecting one foot above the first story in order that they might serve as an anchorage for the second story walls. The result is a perfect bond and an imperceptible joint. Thorough cleaning of the top of the concrete at the line of the first story was the only precaution taken to insure a perfect bond, except, of course, careful spading. The entire ground floor of the house is a monolith joined to the footings. Floor sleepers were placed on top of this concrete sub-base and filled between with concrete of a leaner mixture and subsequently covered with the wooden floors.

The party wall is entirely concrete from the ground to the roof. The entrance porch is solid concrete, including the floor, steps and balustrade. It is 9 feet wide, and 8 feet 6 inches above the sidewalk level, having a return at one side as shown in the picture. A decorative design in Moravian tiles in high relief will be set in the panel shown in the front. Similar decorations will be placed in the panels at the side of the house. The porch is an integral part of the house and built at the same time. The front wall, in a sense, starts at the porch level, being carried on a reinforced concrete beam.

The massive concrete chimneys, a feature which may make or mar a dwelling were cast with the house, and, like the porch, are an integral part of the house. Flue lining was placed upon the inside, and the chimneys capped in red terra cotta. The living room fireplace is shown in an accompanying picture. The surface was left as it appeared when the forms were removed.

The bathrooms have white Portland cement floors, with wainscoting of the same material, all in trowel finish. All concrete was 1:2:4 wet mixture of Portland cement, Jersey gravel and ¾-inch trap rock. While the construction was not difficult from an engineering standpoint, it had to be planned with care to carry it out successfully at certain points, for example, at the bay window and porch. The same care was used in mixing and spading the concrete thoroughly. Reinforcement was wired in position before the concrete was poured.

The entire structure was carefully designed by the architect, cooperating with an appreciative owner, and the plans were faithfully executed by the contractor. And last, but not by any means least, it cost less than a house of the same plan in brick or stone in the same location.

*

* *

To Live in Glass House

Within ten years Rogers S. Pease, a glass manufacturer of Pittsburg, predicts people in this country will be building houses of glass, which will be sound, substantial and practically indestructible. He says these houses will excel in sanitary appointments, beauty and durability, any type of structure of the present time. With foundations of concrete, walls, roof, ceilings and wainscoting of wired glass, and the floors of tile, painting and papering will be dispensed with, and the owner may have his structure cast in the color or colors that please his taste and fancy. It is further claimed that such houses will be windproof, fireproof, and unaffected by moisture. It reads like a fairy tale, but it may not be so altogether improbable. This is an age of invention and progress, and we are prepared for departures from the old manner of doing things. It was not so many years ago when the thought of constructing huge mills and factory buildings by the simple process of mixing sand, water and cement and crushed stone and pouring the mixture into wooden forms, would have seemed equally preposterous.

Joint Meeting of Northern and Southern California Chapters, A. I. A.

By FERNAND PARMENTIER, Secretary Los Angeles Chapter.

THE twenty-eighth meeting of the Southern California Chapter of the American Institute of Architects was held at the Cafe Bristol, Los Angeles, on Monday, April 11. The session was a joint meeting of the San Francisco and Southern California Chapters, and was largely attended. Those present from the Southern Chapter were:

Harrison Albright,
Jno. C. Austin,
J. J. Backus,
A. B. Benton,
C. H. Brown,
J. Lee Burton,
Jos. J. Blick,
Geo. F. Costerisan,
F. R. Dorn,
F. P. Davis,
P. W. Ehlers,
W. E. Erkes,
P. H. Frohman,
Homer W. Glidden,
Chas. S. Greene,
Henry M. Greene,
W. S. Hebbard,
Chas. F. Helmle,
Jno. C. Hillman,
Myron Hunt,
Sumner P. Hunt,
Frank D. Hudson,
Arthur Rolland Kelly,
J. W. Krause,
Jno. P. Krempel,
A. C. Martin,
S. B. Marston,
Octavius Morgan,
S. T. Norton,
Jno. Parkinson,
Fernand Parmentier,
H. M. Patterson,
Thos. Preston,
H. A. Reeves,
A. F. Rosenheim,
F. L. Stiff,
A. C. Smith,
Norman St. Clair,
T. C. Smith,
Wm. F. Thompson,
R. F. Train,
P. T. Van Trees,
H. F. Withey,
R. B. Young,
O. W. Morgan,
W. C. Pennell,
F. W. Young,
DeForest Howry.

The following members were present from the San Francisco Chapter:

John Bakewell,
F. D. Boese,
L. D. Coates,
Wm. Curlett,
Clinton Day,
Lionel Deane,
J. W. Dolliver,
W. B. Faville,
B. J. Joseph,
Wm. Mooser,
L. C. Mullgardt,
J. Cather Newsom,
Mart V. O'Brien,
T. P. Ross,
Sylvain Schnaittacher,
Clarence R. Ward.

The guests of the evening were W. S. Eames of St. Louis, Past President of the American Institute of Architects, and W. D. Coates of Sacramento, State Architect, and the following San Diego architects: Irvin J. Gill and Henry Lord Gay.

The minutes of the twenty-seventh meeting were read by Secretary Sylvain Schnaittacher of the San Francisco Chapter, and duly adopted.

On behalf of the Special Entertainment Committee, Mr. R. B. Young presented a report of the program that had been carried out to date, and the program of April 12, 1910.

A communication was read from Mr. Glenn Brown, Secretary of the American Institute of Architects, requesting the Chapter's action with reference to a contribution to the McKim Memorial in the American Academy in Rome. Upon motion made by Mr. John P. Krempel, seconded by Mr. H. Albright, action was postponed till the next Chapter meeting.

Another communication from Mr. Glenn Brown was read, with advice from the Institute bearing on the issuance of independent schedules of charges by the Chapters. Upon motion made by Mr. R. B. Young, seconded by Mr. John P. Krempel, this communication was referred to the Board of Directors.

Under the head of new business, the President next called for discussion on competitions and the State law on same. Mr. William Mooser, President of the San Francisco Chapter, spoke of the State law and advised as to its amendment, informing the meeting that the San Francisco Chapter had appointed a special committee to draft a resolution to be presented to the California State Legislature. Mr. Mooser furthermore advised the Southern California Chapter to appoint a committee to co-operate with the San Francisco Chapter on this matter, and if possible to cause the rescinding of the present State laws on competitions.

Mr. B. J. Joseph, of the San Francisco Chapter, read extracts from the California State law on competitions with the proposed amendments thereon.

Mr. Octavius Morgan moved, seconded by Mr. John C. Austin, to appoint a committee to co-operate with the San Francisco Chapter, upon which the President called attention to the fact that the Chapter had a committee on special legislation to whom this matter would be referred.

Mr. A. F. Rosenheim called attention to the recently issued A. I. A. code on competitions. He condemned competitions in general, and suggested that the Chapter's influence should be exerted to abolish the same wherever possible, and recommended the direct appointment of an architect. Mr. William Curlett of San Francisco made a few remarks in support of Mr. Rosenheim's recommendations.

Mr. William Mooser called for discussion of the Burnett Tenement House act. Mr. John P. Krempel, chairman of the committee having this matter in charge, presented a report stating that Mr. J. J. Backus had been designated to open the discussion by reading extracts from the Burnett Tenement House act. Mr. Backus read the extracts, adding remarks and suggestions for the proposed amendments. The sections in particular to be amended as read were sections 2, 7, 8, 9, 20, 22, 23, 28, 29, 33, 41, 43, 49 and 82. Mr. Sylvain Schnaittacher cited a case that had been in the courts of San Francisco in conflict with section 23, the building inspector of San Francisco having insisted on the carrying out of the provisions of this section, and the court having ruled against it, saying that a permit may be issued if the building complied with the building ordinances in general. Mr. Schnaittacher also mentioned that section 82 was not enforced in San Francisco.

Mr. Mooser, Acting Chairman, suggested that the Chapter appoint a committee to draft amendments and forward the same to the San Francisco Chapter A. I. A. for comparison, at which Mr. Frank D. Hudson called attention to the Chapter's permanent committee on the Burnett Tenement House act, and instructed said committee to act on the matter at once.

Mr. Curlett next addressed the meeting, thanking the Chapter for the day's entertainment, and spoke in eulogistic terms about the Southern California Chapter.

Mr. Clinton Day indorsed Mr. Curlett's sentiments, and also spoke about the next Institute convention, regretting that the same was not to be held in Los Angeles.

Mr. Clarence R. Ward then spoke in appreciative terms of the Los Angeles Chapter's efforts, which was responded to by Mr. Octavius Morgan, complimenting the San Francisco Chapter. Mr. Morgan also spoke about the State Competition law. Mr. W. S. Eames of St. Louis, Past President of the American Institute of Architects, addressed the meeting with a few remarks.

Perspective of Moderate Cost Country School House
Henry F. Starbuck, Architect

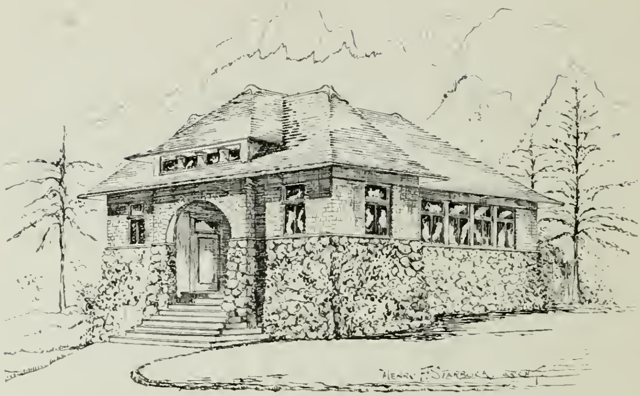
Designs for Country School Houses

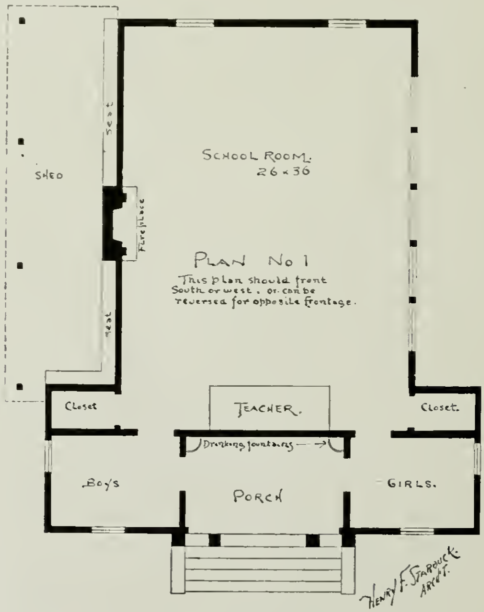
By HENRY F. STARBUCK, Architect.

PERHAPS no branch of school architecture has been so much neglected in California as that of the rural or country district schoolhouse. This is not surprising when one realizes the general conditions which exist in the case of such buildings, usually located at long distances from the business centers, and in many cases without convenient facilities for getting materials of suitable character to make the building even modern in detail, to say nothing of the difficulty of procuring anything ornamental, which in an ordinary neighborhood would be considered a necessary adjunct to the building. Then, too, the good citizens to whom are intrusted the care of these buildings, are generally of the busy, practical, hard working class, whose education has been along the lines of other requirements, and who are not in touch with the artistic side of life.

Buildings of the class I describe are very rarely designed by an architect, or even copied from such designs, and few architects of any ability could afford to give the time and trouble to look after them, unless actuated by a philanthropic public spirit. I have often thought, as I pass through the State and see the rude and ungainly structures which have been built to supply the demand for a small and inexpensive school building, that I would gladly offer my services to assist in starting a line of buildings which should express something of an architectural idea to the young child, whose first impulse in this direction may come from the building in which he learns the rudiments of his future education. Coming, as many of these children do, from homes barren of the least suggestion of art or architecture, how full of inspiration would be a school building—neat, artistic, comely, and attractive. I believe it should be the duty of those having the general charge of schools to insist on these features as not only proper, but absolutely necessary to the best interests of the children of the State. That they should be authorized to see to it that these buildings are made monuments of education, and to impress on the local school trustees that a liberal allowance for this feature is money as well and as properly invested as if spent for apparatus or school books.

What an educator for the fathers and mothers of the district would such a building be, if designed on lines both practical and architectural, for true architecture is a silent, but a persistent teacher, and never sleeps, and it is a surprising fact that a truly architectural building is an inspiration even among the uneducated.





Perspective and Floor Plans for Country School House
Henry F. Starbuck, Architect

Take the working classes of the old world; surrounded by artistic monuments of all kinds, as they grow to manhood they are unconsciously educated by their surroundings, and while as citizens they do not approach our working classes in this country, as workmen they excel in all matters calling for artistic rendering or finish.

In designing the class of buildings required for the rural districts there is a great range of ideas which can be adapted. In the first place, the location should be considered. California contains within her borders every kind of climate and all kinds of country. The architect can properly use in some place every style of architecture which has appealed to the artistic sense of the student. And in the country school, where we are not likely to be handicapped by want of room, and where we may allow the fancy some play, we can design with free hand, keeping always within the line of practical common sense. And architecture is always common sense.

The next feature of this class of buildings to be developed is the material. All kinds of material offer themselves to the true architect. In our mountainous sections, what better or more architectural material than the stone which abounds on every hand. If the demand were created men could be found who would build such work so that it would be scarcely more expensive than ordinary wood construction. Under the direction of some intelligent master workman much of this work could be done by the people of the district, and thus a general interest be aroused which would be the beginning of better things.

In the redwood districts, what would be more truly architectural than a log cabin effect of natural logs. I can imagine the most pleasing results from this line of suggestion. In fact, it is the only real American style of architecture, and is worth developing for general reasons.

In other locations, the broad bungalow effect is suitable, and it is somewhat strange that this style has not been more generally adopted. It is peculiarly fitted to California, and is economical in construction and attractive in effect.

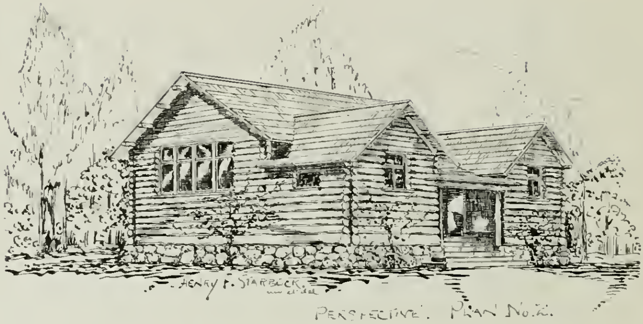
For the portions above the reach of the hands of mischievous pupils a most excellent finish for the exterior is cement plaster, on either wood or metal lath; the latter preferably in locations at a distance from the ocean. In the vicinity of the coast it is short lived, and has been known to rust out entirely in a short time.

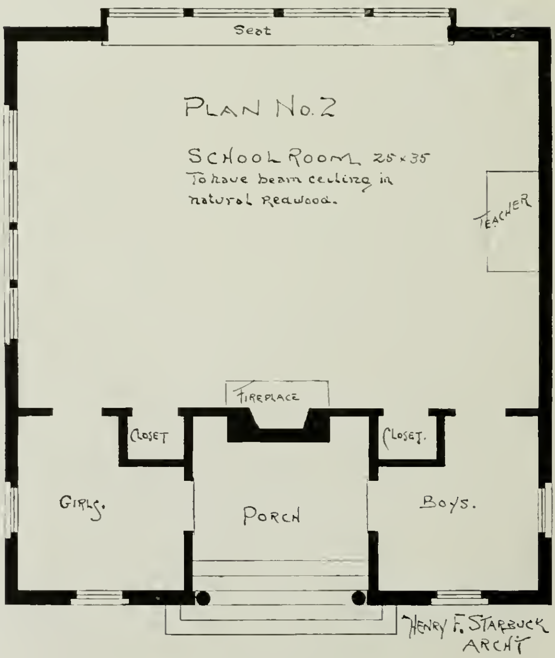
In the matter of technical detail, the same rules should be followed as in the larger city buildings, and in this article it is not necessary to go into this fully. I am not a faddist in matters of light, heat, and ventilation, but these should be considered with careful study, having in mind the means at hand available for the purpose.

Light should be plenty, and on both left and rear, the greater amount on the side. While unilateral light is very strongly advocated by many, I do not believe it the best for the average rural school building. The location, however, may determine this to some extent, and if the amount is sufficient it may be the best in some cases. My own observation is that the main point is to have plenty of light, and of course, not in the face of the pupils.

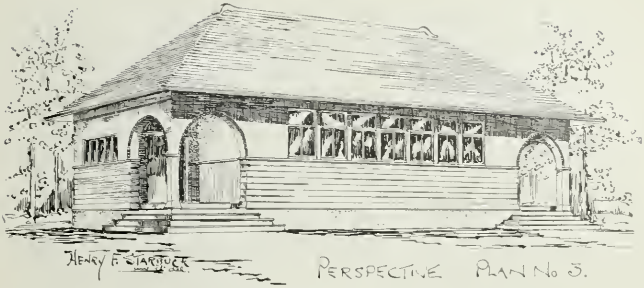
Ventilation is a most important point, also, but in the small buildings of the outside districts it is not always possible to have anything like a ventilating system or apparatus, consequently the only thing to do is to make such provision as can be without too much expense.

Probably the best and simplest plan in a building of this sort is the open fire. Of course it has its objections, but in the localities where it is not too cold, the room can be well heated before the pupils assemble, and a moderate fire after school is opened will keep up the heat, and the ventilation from a





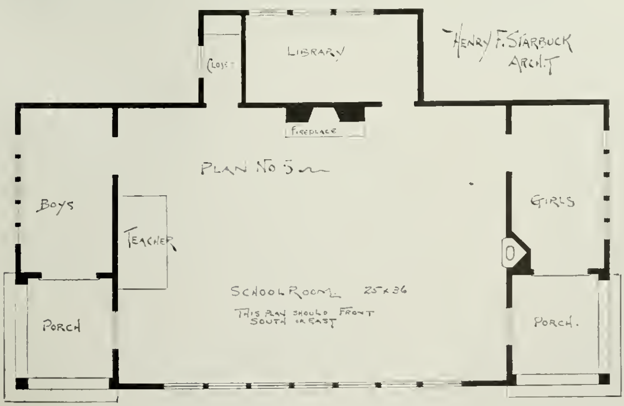
Perspective and Floor Plan for Country School House
Henry F. Starbuck, Architect



good fireplace is one of the best systems known. This may sound heretical, but I think it can be proved. In the open country, where the air is uncontaminated, there is nothing better than the pure outside air, and I make use of casement windows which open outward in both directions, thus enabling the air to be drawn out or injected, as the sash are opened toward the wind or opposite.

Where the cost can be afforded the best and most effective mode of heating these small buildings is a hot air furnace, which, in a pit under the building can be made to heat thoroughly all the rooms, and as the heat is carried by a flow of warm air through the furnace, ventilation is also furnished by the influx of this into the room, which can be allowed to pass out by the windows, or through openings prepared for the purpose.

I have in this paper made suggestions only. The local conditions, the amount of money available, and the particular requirements of the case, determine many of the points under consideration and what I have laid down is open to these modifications. This applies as well to the sketches of buildings



Perspective and Floor Plan for Country School House
Henry F. Starbuck, Architect

Portal of Marathon Apartments, San Francisco
Crim & Scott, Architects

which accompany the article, and which are not intended to be perfect or complete plans, but only to form a basis for exemplifying the above ideas.

As such they will explain themselves. I have shown as one of the designs for Plan No. 1 a conventional style, which would be appropriate in a village or small town, and a rustic design in which I have introduced the local stone and shingle finish more suitable for a rougher country, and peculiarly adapted to the mountainous sections.

Plan No. 2 shows what could be done in the redwood country, and if neatly finished in a similar style on the interior would be appropriate and artistic. I would suggest the roof to be of the local "shakes," as adding to the architectural effect.

Plan No. 3 is in the simple bungalow style, and is appropriate for any of the flat country of the State. The broad eaves give a sheltered effect, and are practical in the protection of the windows from strong sunlight, and the simple lines of construction make the design one which will give the greatest value for the cost of building.

Concrete as a Preservative of Wooden Piles Exposed to Seawater

By C. C. HORTON.

State Engineer Ralph Barker's experiments, resulting in the adoption of a form of concrete construction for the permanent protection of the wooden piles in San Francisco Bay from the destructive attacks of marine borers, as told by him in the March Architect and Engineer, has aroused much interest.

There is undoubtedly a strong prejudice in the engineering profession against laying concrete under water. Millions of dollars are spent every year on coffer-dams and caissons, in order to lay foundation concrete in the dry. Notwithstanding this, it is entirely possible to lay concrete under water which will be as sound and solid as the best concrete laid in the open air. In the construction of the Detroit tunnel, a large amount of concrete was deposited around the submerged steel tubes. A core from this concrete was recently examined to determine its quality. The core was as sound and solid as a natural conglomerate rock. Test of samples have shown a strength as high or higher than the best specimens of concrete laid in the open air. This concrete is deposited through a tremie, or long tube with its upper end in the open air a considerable distance above the water surface, and its lower end at the point where the concrete is to be laid. Concrete put in place by such methods is forced in under a pressure far greater than is possible with any hand-ramming ever used. There is no space for voids and no opportunity for the entrance of air. Furthermore, the concrete is never dried out in the process of hardening, and has always available all the water that it needs for its final set.

Of course "one swallow does not make a summer," and to offset this case, plenty of examples can be quoted where concrete has been laid under water with very disappointing results. But it all depends on how the work is done and the conditions under which it is carried on. Cases like that at Detroit deserve the attention of engineers as showing that there are alternatives to the construction of expensive coffer-dams and pneumatic caissons. It is entirely possible that by more intelligent work in laying concrete under water the cost of many pieces of submarine foundation work could be greatly reduced.

The following article by C. C. Horton, read before the National Association of Cement Users, is along much the same lines as described by Engineer Barker, with some additional facts of particular interest.—Ed.

IT has long been the aim of engineers and builders to find some method of treating or protecting wooden piles or other wood structures from the destructive attack of marine borers, of which the teredo and the limnoria are the chief representatives. Many methods have been tried, and success more or less marked has attended some of them. The principal methods are the chemical treatment of the wood fiber and the mechanical protection of the pile or timber by a protective covering of metal, treated wood or concrete. However, we are interested only in the application of concrete or cement and will pass over the other methods with but brief mention.

Under the head of "chemical treatment," creosote should be given first place. This proves very effective until by abrasion or dissolution, the pile loses its sheath of impregnated creosote and becomes open to attack by the destructive ship-worm. A pile so treated is effective for approximately fifteen years, if it has received no mechanical injury to split or otherwise damage it.

We shall now consider the concrete covering of wooden piles, of which there are quite a variety and several classes, and we shall endeavor to describe several, which are more or less practical. We shall classify them "A," "B," "C" and "D," merely to distinguish them and not according to their relative merits.

CLASS "A." A wooden pile covered with a jacket of concrete, made by placing a mold around the pile and filling with concrete reinforced with steel or not, as desired, applied before driving. This makes a pile that can be inspected without trouble, but has the drawback of being heavy and difficult to handle and drive. It will sink, presenting the same difficulty as a solid concrete pile in this respect. Furthermore, the same precaution must be observed in driving it as in the purely concrete pile. It is difficult to give exact costs as these will vary with the size of the pile, the length covered on each, the varying cost of materials, the proportion used in the concrete, the use or omission of reinforcing, cost of labor, etc. We shall endeavor, however, to give a relative cost of the several methods, so that a comparison of the various classes may be made.

CLASS "B." This class includes piles covered after they have been driven and before the superstructure has been built. The covering is applied by lowering over the pile a continuous concrete wood or steel jacket, so proportioned as to leave an annular space between the pile and jacket of from two to four inches, preferably the latter; this space is then pumped out and filled with concrete.

This method presents some difficulties where deep water is encountered, due to the liability of the jacket to collapse, if built of wood or steel. Furthermore, it is difficult to exclude mud and water if the sea bottom is soft or if the casing is not perfectly tight. It is sometimes found necessary to seal the bottom with cement and allow it to set before pumping out the annular space. This pumping out should be as complete as possible for the best results.

CLASS "C." This is a modification of class "B" in that it uses the same type of jacket, with the exception that it is made sectional and in two parts to admit of its application to wharves already built or where the superstructure is in place. A tile jacket is sometimes used in addition to the others of class "B."

The jacket is applied by placing the sections around the pile and is lowered section by section, by suitable means, until the submerged portion of the pile is covered and sufficient penetration is obtained into the sea bottom; the annular space is then filled with concrete without first pumping out the sea water. With this style of construction, it is impossible to exclude the water and mud, which is a serious drawback. The concrete is liable to be of inferior quality, especially at the bottom, the very point that should be made the most impregnable, the mud line being the principal point of attack, of that most destructive of wood borers, the teredo.

CLASS "D." This is of more recent origin than any of the previously described methods of armoring. It consists of a light steel sectional jacket, fitted at the bottom with a self-adjusting diaphragm, made to accommodate itself to the irregularities of the pile. The method of procedure is to fit the bottom section containing the diaphragm around the pile and fill with concrete, the section being suspended from above by suitable means, usually by winches. The first section is then lowered sufficiently to permit the addition of another section, which is filled with concrete; this is repeated until the submerged portion of the pile is covered and the desired penetration is obtained into the sea bottom section containing the diaphragm around the jacket should be at least four inches, and in large piles of say eighteen to twenty inches, five or six inches.

This method renders the concreting of piles very simple and effective and obviates the principal difficulties of the three other classes of covering. It is especially adapted to the repair of old wharves, badly eaten by either the teredo or the limnoria. The San Francisco harbor board has adopted this latter method for the repair of its old wharves, and finds it economical, easily applied and durable. Classes "A" and "B" are not suitable for the repair of old wharves, the expense being prohibitive. Between class "C" and "D" the latter may be applied for approximately 20 per cent. less per linear foot than the former.

For new work, classes "A," "B," and "C" would cost approximately the same. with a slight possible advantage in favor of class "A." Class "D" may be applied to new construction more cheaply than on repair work, and would run 20 to 25 per cent. cheaper than any of the other methods.

The San Francisco harbor board is paying $1.55 per foot for class "D" work on all sizes of piles. This includes profit and royalty, the actual cost ranging from $1.00 to $1.25 per linear foot.

* * *

Concerning Wall Coverings

THERE has been an immense change within the last few years in the style of wall paper and in the quality of the color value, says a writer in Suburban Life. A few years ago dark greens and reds were all the rage for living rooms. Red is difficult to live with; it is too assertive for large spaces, as it absorbs the light, and those who are sensitive find it unrestful and too exhilarating. Red is beautiful in small quantities or where a touch of bright color is needed. A quantity of white woodwork, bookcases and fitments tend to obviate this feeling; but it is better in the beginning to have something less assertive for the atmosphere of the room. There is a beautiful shade of Pompeian red that has something of an old rose quality; it can sometimes be used with good results, but even this shade requires considerable woodwork and wall fitments to make it successful. Pale, soft greens, browns and wood colors, soft grays and pale, cool colors of every description are preferred today.

Perhaps the most effective treatment for the wall is a sufficiency of woodwork, wainscots and paneled walls. Ceiling beams and built-in furniture are a part of the house itself, and serve to draw it closer to the needs of daily life.

Figured papers are not so much used today as they were. People are apt to tire of the pattern, and then a change is necessary, not because the walls are soiled, but because the craze for novelty and change tends to make the home-maker turn everything "topsy-turvy," to have a new scheme in the room. Tapestry papers have so long been used for the dining room that, although they are not the mode today, there is something so charming about their soft, mellow coloring that there will always be found plenty of people who choose them. They are still used above the book-cases and wainscot in living rooms, and seem to be well suited, because of their cozy appearance for such rooms. A new kind of paper is seen this season in modern dining rooms; the background is variegated and has a fabric effect; it comes in pale tones. Each length of paper terminates with a crown frieze. These friezes are thoroughly Dutch in character, and are of fruit motifs; walls treated with these papers are most beautiful. The paper costs $1.50 a roll, two crowns coming in each roll.

The parlor is the most difficult room in the house to deal with. If used for only formal occasions and as a reception room, it can be treated in a formal way; but, if it is used for every-day life, the walls should be treated like those of a living room. A parlor can be decorated differently from the other rooms, white paint generally being preferred, even if the woodwork all over the house is stained, or of dark natural tone. A thing of the past are the parish parlors of a few years ago when the walls were paneled in cheap paper, and divided by narrow molding in imitation of French walls. If a panel parlor is desired, the walls can be covered with white paint, and real wooden moldings laid on the walls, dividing them into correct sections.

R. B. Young & Son, Resident Architects *The New Orpheum Theater Building, Los Angeles* *G. Albert Lansburgh, Architect*

A Dining Room in Koa Panels and Oregon Pine Trim

Hardwood Veneers for Interior Trim

By M. W. DAVIS.*

NOTWITHSTANDING the rapidly increasing wealth of the American people as a whole, there is a laudable spirit of economy in all matters relating to the great natural resources of the country. This is nowhere more apparent than in the subject of the forests and their denudation. Colonel Roosevelt, as president, sounded a sharp note of warning several years ago and the subject has absorbed the attention of public officials and public economists ever since. That the rapid increase and lavish expenditure of wealth should have a debilitating effect on the raw materials used for building purposes was to be expected. So fortunately, however, has the building trade fared by reason of new processes and inventions that in the case of fine hardwoods the drain will not be so seriously felt.

The hardwood supply is by its very nature, limited. Before the introduction of modern veneering methods the drain threatened to eventually deplete the hardwood forests. The fancy woods were the worst sufferers. Fine mahogany, teak, oak, walnut, birch, maple and other woods in use for interior finishes were being rapidly exhausted in all parts of the world. The demand upon these woods for decorative and finishing purposes is, and always will be, enormous. On account of their extreme richness and beauty they appeal to the refined sense, and where money is no object many rash sacrifices of valuable hardwood timber have been made to gratify tastes expensive and elegant.

*Vice-President of E. A. Howard & Co., San Francisco. The illustrations accompanying this article are of hardwood veneers manufactured by E. A. Howard & Co., San Francisco.

Living Room with Quartered Oak Panels and Oregon Pine Trim

Crotch Mahogany Panels, Redwood Trim

An Attractive Dining Room in Oak Panels

A Stairway with Panels and Trim of Birch

Koa Panels and Oregon Pine Trim

Trim and Panels of Quartered Oak

Quartered Oak Panels and Oregon Pine Trim

Trim and Panels in Koa

Panels and Trim of Oregon Pine

Modern veneering methods, however, not only tend to economize in the use of these beautiful woods, thus prolonging the life of the forests, but, in addition, provide more real beauty, more durability and more genuine elegance than was ever made possible by the solid wood itself. This phase of the subject is made more readily apparent by a glance at the handsome interiors recently installed in San Francisco, Oakland and Berkeley homes.

Built-up panels of all the hard woods, in selected veneers, bring out all the picturesque beauty of the grain. Effects never possible in the solid piece are obtained in this way. The result is an interior trim for dining-room, parlor, bedroom, library, den or reception hall never before accomplished. The panels are made in units. They may be matched, alternated, or used in combinations. They may be selected exactly to suit the refined taste of the home builder. Reception hall and parlor may be finished in mahogany or quartered oak. The dining-room may be paneled in quartered or weathered oak. The library may be finished in curly birch, and the young lady's bedroom in dainty maple, if desired. Combinations giving tone and elegance, dictated by the most refined taste, and formerly possible only in the homes of the very wealthy, are by this modern process of veneering brought within the reach of those of moderate means.

Nor is this all. The solid wood, even when perfectly seasoned, was subject to time and atmospheric changes. It could not be guaranteed against warping, splitting or shrinking. The elements, the temperature and the natural decay of time affected it. The new process of veneering has changed all this. Built up from a solid base or core, under enormous steam pressure and held together by specially prepared glue, the modern panel cannot warp, split or

Den with Elm Panels, Stained Mahagany, Redwood Trim

shrink at any time or under any conditions. Once installed it remains longer, more beautiful and more pleasing to the sight than the solid wood ever could become.

Besides the natural economy in the conservation of the hardwoods of the forests, the new veneering process mentioned ushers in a new day in home decorative art. The standard of home finish is raised by rendering it possible for those in moderate circumstances to secure interior surroundings formerly within the reach of wealthier classes only. The paneling of a room, which in the solid wood would amount to hundreds of dollars, is now made possible for twenty-five or thirty. The artistic longings, just as dear to the heart of the builder of a bungalow home as to the architect of the mansion, may now be gratified. The elegance and beauty of rich woods may now be included in the finish of the ordinary flat and the value and appearance of the rooms wonderfully enhanced at trifling cost. Nor does the benefit of the new process stop at beautiful hardwood panels. The doors also undergo a pleasing change. Elegant flush and panel doors are coming into vogue, harmonizing with every forward step of home improvement. These doors are built up in the same manner; portraying all the dainty lights and shades of the quarter-saw grain, and contributing by their presence to the beauty of the bungalow or the stateliness of the mansion.

Thousands of these panels are kept in stock by the manufacturers. It is as easy to select the wood desired as to choose the carpet or the rug. It opens the door to the exercise of individual taste. It provides a means by which those in fair or moderate circumstances may surround themselves with the luxury and beauty of costly woods, yet never feel the strain.

Concrete Fireplaces and Chimneys

IN the past few years concrete has been used for fireplaces and chimneys with varied success, the dry-tamped chimney block proving the least practical owing to its scaling off on the inside from the heat until the upper blocks were but a frail shell and the lower half of the chimney was filled with a solid mass of rubbish consisting of worthless cement. The many failures of concrete as a substitute for fire clay brick, are due to the fact that too much was expected of this one material.

Concrete varies according to the material from which it is made, and while concrete made of ordinary raw materials will crumble at a few hundred degrees of heat, other concrete made of other, yet ordinary materials, will resist four or five times as much heat without injury. We must learn, therefore, to make concrete according to its uses, which will necessitate classifying accordingly the same as wood. For example, we would not think of making furniture, such as chairs, of hemlock, nor do we think of making drawing boards of oak, yet both are wood. A cement and sand composition may be such as to admit of a polish like marble, or it may be as gritty as a grindstone, and both be known as concrete.

A concrete to withstand continual heat of a high temperature, must be made to meet the requirements. With the object of discovering the best concrete for high temperature, the writer built a fireplace several years ago, using cement brick of various raw materials, and recently made a careful examination of the work.

Brick made of one part (high burned Portland cement) to four parts crushed furnace slag sand, and after seasoning dipped into a weak solution of soft soap, remained uninjured or discolored; in fact, after being washed they were as perfect as when the fireplace was built. The brick made as above but not dipped, were sound, but somewhat discolored, indicating that the soap dip prevented discoloration. Brick made of same cement and clear sand which had been previously heated to about 1,500 degrees, also remained intact when containing one part cement to five parts sand, but those made of one cement to three parts sand were badly cracked, all were discolored; those having been soap dipped were found in best condition.

All brick made of crushed sandstone, or limestone screenings were more or less injured, those with sand made of crushed gravel or granite held better than those of unheated sand, but when sprinkled with cold water they soon broke into many particles, the gravel and the granite quartz being affected about equally, as the soap dip did not protect either materials from discoloration.

The results plainly indicated that a porous concrete (containing less cement) was more fireproof than a rich dense composition, while discoloration was less on the more dense (richer) composition. It also indicated that a wet mix was much superior to the dry tamp brick for all materials.

Summing up the materials, the following points to be used in making concrete for a fireplace or chimney lining, are given:

Never use gravel or crushed granite or marble; while hard, blue limestone may be used for only moderate heating places, after same has been subjected to a high temperature before mixing with the cement.

If possible, use only crushed furnace slag for sand, and if same is unobtainable then use a sharp silica sand first heated either in a furnace or large outdoor fire. Always allow the heated material to become cold before mixing for concrete.

Always make the concrete sufficiently wet to make a stiff mortar, while thin enough to pour does not add to the quality. The concrete may be dipped or coated with a solution of one part soap dissolved in 20 parts water; while this does not add to the fireproof qualities it does much to prevent discoloration.

The Cost and Advantages of Using Brick

By J. PARKER B. FISKE, S. B.*

MANY people have the idea that brick cannot be advantageously used in the construction of a moderate sized country or village house, and that it is adapted only for factories or store houses on the one hand, or for apartment houses, business blocks, or very expensive mansions on the other, the opinion being prevalent that a brick house must necessarily cost a great deal more than one of frame.

While it is true that a brick building is slightly more expensive than one of frame, the difference is far less than is generally realized, and the practical as well as the aesthetic advantages of brick so far outweigh the slight increase in initial cost as to make it the more appropriate and desirable material.

In discussing the comparative cost of different forms of construction it must be understood that no figures can be given which will apply with equal accuracy to all parts of the country, as the relative cost of different materials and different classes of skilled labor vary in different localities. Thus, the frame house, as to first cost, would make a much more favorable comparison with brick when built in Maine, near the lumbering centers and far-distant from the brickyards, than it would when built in the great brickmaking state of Ohio, where the freight is high on lumber and little or nothing on brick.

In order to discuss this matter intelligently, therefore, a certain representative locality must be selected and from the comparative cost of different styles of construction in this locality, modifications can easily be deduced by the architect to suit other local conditions. With this idea in mind we have prepared the following figures, taking as a basis a frame house costing $10,000, and built in New Jersey within twenty-five miles of New York City.

In preparing these figures we have had the advice and assistance of several New York architects of high standing and unquestioned authority, and several contractors who are familiar with country house construction.

Taking this house as planned entirely for wood and leaving the inside arrangement and finish untouched, we show approximately the comparative cost of varying the outside construction as follows:

(A) $10,000 Frame house.
(B) 10,500 Stuccoed on expanded metal nailed to wood frame, lathed and plastered inside.
(C) 10,750 Hollow terra cotta blocks for outside walls, stuccoed on the outside and plastered directly on the inside.
(D) 11,000 Solid brick outside walls, plastered directly on the inside.

In the above list, the frame house is, of course, of the smallest initial cost, but the prospective home builder who adopts it for this reason will find that it is the most expensive in the long run. It needs constant painting and repainting, entailing a large fixed expense. Even the best lumber obtainable today soon begins to give way or rot out in places. If not painted and repaired, the house soon becomes dingy and unsightly. It is the most difficult to heat. Cold in winter and hot in summer, it is the most uncomfortable of any house to live in, and it is liable to burn down at any time. While the cost of painting and repairs is merely nominal for the first year or two, it increases in rapid progression from year to year; failure to promptly meet these expenses will result in a correspondingly rapid depreciation in value either for sale or comfort. These expenses within five years will have amounted to as much or more than the difference in first cost between wood and brick, and if conditions compel a sale or desire dictates one, the first cost of the wooden house can rarely be obtained, while the brick house has been growing better and more beautiful each day and has, therefore, increased in value.

The stucco house seems to be having its day just at present and to be meeting with favorable consideration from some architects and owners, but we believe that a careful study of its characteristics will show that it has no advantage over a wooden house unless it be that of appearance when first constructed. The clean, light walls and comparatively low cost have made it appear attractive, we believe, without a full consideration of the ultimate results of its use, especially as it is a new type of construction and has not as yet been stamped as wholly good by the seal of time.

By stucco walls we mean those that are constructed with a metal base supported by wood and coated with a layer of cement mortar. When first completed such a building looks inviting with its light walls and its red roof, but time soon lays its disfiguring hand upon it, soils its once light surface to a dingy gray and irremediably streaks and blotches it with dirt; cracks develop because of the shrinking of the timbers supporting the metal base and its stucco surface; leaks appear here and there and ere long the stucco begins to drop off and can not be renewed without unsightly spots and an indication of early depreciation.

The surface of a stuccoed frame house suffers less in a dry than in a moist country, but some dampness is constantly being transmitted by the stucco to the metal lath and the rusting process of the latter is slowly but surely going on. In many instances the metal lath rusts and stains the stucco—in others it rusts away entirely and the stucco drops off. When this occurs patching is impracticable, and the only remedy is to relath and restucco the entire surface.

The advocates of the stuccoed house often point with assurance to the permanency of the stuccoed buildings of Europe. They neglect to mention the fact that the only permanent stucco work of the Old World is that which was applied upon brick walls, and that much of even that construction has required patching from time to time. The recent American innovation, however, of putting a thin layer of porous stucco upon a frail metal fabric, which in turn is mounted on wood, is an entirely different matter. The inevitable shrinking of the timbers and the rigid character of the stucco supported thereon combine to make this construction about the most unmechanical and illogical that has ever been seriously considered.

Even when the added expense is incurred of using hollow clay blocks for the exterior walls and cementing on them, the same results are sure to occur sooner or later, as the expansion and contraction of the burned clay base differs from that of the cement, and it is only a question of time when cracking and peeling will result.

When we have sought an honest expression of opinion from practical builders of experience, as to the value of cement for exterior wall construction in good residential work, we have been met with the statement that this construction is too new to warrant a prediction as to its ultimate life or value. The chief argument in its favor at present seems to be that it is attractive, not much more expensive than wood, and saves the cost of repeated painting. No argument is made in favor of its being more comfortable to live in, cheaper to maintain, or safer in case of fire. The undeniable fact remains that it is still in the experimental stage and may prove most expensive and disappointing to him who adopts it.

We come now to brick, the most durable, the most artistic, and, in the end, the least expensive material for the walls of first-class and permanent buildings. Brick meets every requirement. It is absolutely repair proof; there is no painting, no patching, no expense of any kind for generation after generation on a good brick wall. The walls are not combustible, as the bricks have been through a white heat for days in their process of manufacture. The item of insurance expense alone is so much less on a brick house that it much more than covers the interest charges on the difference in first cost. A brick wall makes a house cooler in summer and warmer in winter. It gives no chance for lodgment of vermin. It reduces heating bills, repair bills, and insurance bills.

We will not take much space here to discuss the folly of non-fireproof construction for the American home—it is too large a subject. The country is rapidly awakening to the almost criminal waste occasioned by the use of a construction whose only excuse is a slight saving in the initial cost. Statistics show that in the year 1907, which may be termed a "normal" year, actual buildings and property destroyed by fire were valued at $215,000,000; that we spent about $300,000,000 in the maintenance of fire departments and apparatus; that we paid out $195,000,000 to the fire insurance companies, of which we received back only $95,000,000; in other words, that the cost of fire, directly and indirectly, was over $600,000,000. With all our phenomenal growth, our tremendous booms and vast amount of building construction, the most active year we have ever had netted us about $615,000,000 worth of new buildings and alterations, so that with all our boasted progress, we produce buildings equal in money value to only a trifle more than the value of the property that we lose by fire. Furthermore, it is appalling when we consider that fire has cost us as many as 7,000 human lives in a single year.

Europe has long ago learned better. The cost of actual combustion and destruction of property in this country is equal to a tax of $2.30 per capita per year; the average corresponding tax in Europe is a trifle less than 35 cents per capita. Truly, we have much to learn of the older countries, and a study of the reason for their superiority will lead the student directly to the fact that throughout Europe the almost universal building material is brick.

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A New Use for the Pergola

A distinct departure in cemetery architecture is described in the March number of Country Life in America. A year ago Mr. Edward Bok, of Philadelphia, purchased a lot in the cemetery with his mind fully made up that he would depart from the usual ugly and conventional treatment. He sketched out what he called an outdoor room—a scheme that would have all the peaceful beauty of an outdoor resting place and yet have none of the grewsomeness which is invariably associated with cemetery lots.

Eight graves were first dug, all on one side of the lot, and in each were built four walls of solid concrete 6½ feet high and 6 inches thick, rising to within 18 inches of ground level, each grave being covered with a slab of North river slate securely cemented down. Twelve concrete pillars, 16 inches in diameter, were next erected, and on top of them were placed cast iron beams. Then English ivy, wistaria and box were planted, and the ground sodded.

No grave mounds are used, so save the head-stones, there is nothing to suggest the presence of death. With a beautiful view from the limestone seat extending some six miles down the Schuylkill river, it is exactly what its owner sought to make it—a beautiful outdoor room full of the suggestion of peace.

Blake & Johnson Plant, Waterville, Conn. Tar Sub-Floor in Process of Construction.

Making a Factory Floor

IN making plans for the Blake & Johnson factory, at Waterville, Conn., the engineers, Messrs. Griggs & Hunt, of Waterbury, Conn., were confronted with the requirement of a 4-inch wooden floor on the second story, although the floor panels themselves were to be of reinforced concrete. The usual method of construction in such cases has been to bed wooden nailing strips in the concrete flush with the surface and nail the floor planks to these strips. That plan was first considered, but there is always danger of dry rot where wood is embedded in concrete, and protection against dry rot was essential. The method adopted was similar to that used under the lower floor in many factory buildings, and seems so admirably adapted to the requirements that it is strange that it has not occurred to others to use it where the wooden floor is required on top of concrete.

For twenty or thirty years it has been the practice where a wooden floor is required directly on the ground without space beneath to omit sleepers and bed the plank directly on from 1-inch and 2 inches of sand mixed with sufficient good heavy coal tar to fill the voids in the sand. This not only protects against decay that would be caused by dampness from the ground, but the creosote oil in the tar also acts as a wood preservative.

The foundation has often been of concrete, but more usually of cinders or broken stone or gravel mixed with enough tar so it would compact well under a roller and provide a good, true and level surface for spreading the sand and tar. The mixture of sand and tar provides a perfect bedding for the planks, which are tied together as firmly by the hardwood wearing surface laid at right angles or diagonally as a single floor would be by the use of sleepers.

The adoption of this idea on the second floor of the Blake & Johnson factory is shown in the accompanying view. In this case the foundation (the reinforced slab) was already in—all that was needed was something on which to bed the planks. Sand alone would not answer, as vibration would cause it to shift; but by mixing tar with the sand this danger was overcome and the protection afforded by creosote oils in the tar was obtained. Refined tar was used, and about fifty gallons mixed with each cubic yard of sand.

The mixture was spread on about 1⅛ inches thick (so it would compact to 1 inch) levelled with a straight edge, and while it was still warm and soft the planks were laid on it and tamped until the proper level and stability were obtained. Following the 2-inch plank a ⅞-inch rough pine board was laid, and then a surface of 1¼-inch square edge maple. If the experience of twenty or thirty years counts for anything, the planks in this floor will last as long as any part of the building, and if the hardwood wearing surface wears through in places, repairs will be a simple matter.

*

* *

Good and Bad Wall-Paper

FIRST impressions count for much in everything and nowhere more than about a home. Poor taste in outside painting, a miscellaneous collection of red and green flower pots and boxes in the yard, unswept walks, an untidy entrance and finger marks about the door all create prejudice.

Recently a friend asked me, says a correspondent to "The Portland Express," to inspect a new house just offered for sale and called a model. As we entered the reception hall the attention was immediately fixed on the wallpaper of the living-room. Detached bunches of stiff red tulips of more than natural size with bright green leaves were scattered over a plain white background, giving a most glaring effect. At once we knew that no picture could be hung on the wall, no rug, cushion or drapery used unless possibly of deep dark green.

At best, who would want to live the year round in this mimic garden of mammoth tulips, each exactly like the other. It is no overstatement to say that with the exception of that wallpaper the house was charming, both in convenience and decoration, and yet it left a great sense of dissatisfaction. I visited it with another home-seeker, later and was pleasantly surprised to find the tulips replaced by a cream-colored paper, to which was given a little sheen by narrow satin stripes. Anything and everything would combine with that refined wall covering.

Green is now often seen in dining-rooms and it is a great relief from the deep red which was either imposed upon or selected for nine out of ten dining-rooms for several years. The dining-room in the house just referred to has dark weathered oak finish and a beamed ceiling. Five feet from the baseboard to the wide plate rail the wall is covered with an olive-green canvas. Above the rail is a series of small light-colored panels into which hang bunches of purple grapes and a tangle of the leaves run along the top of the room. Everything is harmonious in the room, even to the plain brick fireplace with its single heavy shelf above.

The good idea in bedroom papering seems to be either a plain or self-toned paper combined with flowered paper patterned after chintz or with narrow borders like those used many years ago. Some who can afford it go to a high-class house decorating and furnishing shop and select the chintz paper, with window draperies made to match, then if they do not realize that enough is as good as a feast they upholster a chair; cover cushions and make bedspreads of the same chintz. Window draperies and perhaps a cushion or two are sufficient.

Road Improvement in California*

By H. R. POSTLE, Los Angeles, California.

THE California process of road building has evolved what may be designated as an asphalt-macadam, which has, during the past ten years, demonstrated its fitness for country roads and all residence streets not subjected to extraordinary traffic.

It will be well to comprehend in the beginning that California asphalt is quite a different product from any asphalt or residue manufactured from the oils of any other section of the United States. It is asphaltic, not paraffine, in its base. It is far richer in bitumen and hence needs much less refining, if any, to bring it to the consistency of an asphaltic flux, whereas oil, containing paraffine or carrying only a small percentage of asphalt, must be refined at very high temperatures, and the asphalts obtained are simply residues resulting from repeated and prolonged refining processes.

California asphalt, which has been refined only to reduce to consistency and is in no sense a by-product of a prolonged refining process at high temperature, has had by far the best chance in the refining process.

Much California oil will test eleven or twelve degrees Baumé and carry seventy per cent of asphalt as it flows from the wells, or nature's refinery.

Another important difference is that California oils, besides being asphaltic in base, belong to the unsaturated series of hydrocarbons, are rich in petrolenes and oxidize readily when exposed to the atmosphere; consequently, they have excellent binding and cementing qualities and harden into a durable road surface.

The California cities which have a large mileage of asphalt-macadam streets are Pasadena, Hollywood, Riverside, Redlands and Ventura. The city of Los Angeles, profiting by the experience of her surrounding smaller cities, has, during the present summer, laid her first asphalt-macadam pavements.

The Pacific Electric Railway uses, with very satisfactory results, the asphalt-macadam construction between the car tracks on streets paved with sheet asphalt in the city of Pasadena and Long Beach. The county of Los Angeles has issued bonds for $3,500,000 and is now building three hundred miles of such roads. San Joaquin and San Diego counties have each sold bonds amounting to one and one-half millions of dollars for building county roads. The counties of Ventura and Santa Barbara are building many miles of asphalt-macadam roads.

There are three prevailing methods of construction. One method is to spread and compact by the steam roller a layer of foundation macadam consisting of stone two and one-half or three inches in size to a thickness of about four inches when compacted; this layer of stone is then coated with liquid asphalt at a temperature of about 200 degrees F. at the rate of three-fourths of a gallon per square yard of surface covered. A second layer of stone three-fourths of an inch to one and one-half inches in size is then applied and compacted to a thickness of about two inches. A second coating of liquid asphalt at a temperature of about 200 degrees F. is then applied at the rate of three-fourths of a gallon per square yard of surface covered. The surface of the roadway is then covered to a depth of not more than one-half inch with rock screenings, free from dust. After being thoroughly rolled, a third application of liquid asphalt at a tempera-

* Paper read at the Sixth Annual Convention of the American Road Makers' Association, Columbus, Ohio, Oct. 26-29, 1909.

ture of 200 degrees F. at the rate of one-fourth of a gallon per square yard of surface covered is given, lightly covered with screenings, dampened and again rolled, which completes the work.

A second method is to plow, pulverize and crown the roadway, thoroughly mix into it about two gallons of liquid asphalt for each square yard and to partially solidify it by a tamping machine. At this point from two to five inches of crushed rock, or gravel, are added, coated with about one gallon of liquid asphalt per square yard of surface covered. Sufficient material of the road surface is cultivated into the rock to supply a binder, when the whole is tamped with tamping machines until it is compact and unyielding. The finish consists of a coat of liquid asphalt at a temperature of about 200 degrees F. at the rate of about one-half a gallon per square yard of surface covered and a coating of rock chips or gravel which is dampened and rolled.

The third method of building California roads makes use of methods which are destined, we believe, to have a wide acceptance and usage. This method consists in compacting with tamping machines a six-inch layer of earth and of placing upon it a layer of asphalt-macadam of from three to six inches in thickness and containing about one and one-half gallons of liquid asphalt per square yard of surface. The foundation of earth may be compacted with or without an admixture of asphalt. The striking feature of this method is that it improves the foundation while cheapening the cost of construction, offering, as it does, a method whereby better roads can be built with greater economy.

The development of the California road with its asphaltic surface and tamped base is responsible for the invention of some interesting roadmaking machinery with which asphaltic surface can be economically made and repaired.

Inasmuch as the asphaltic surface is inevitable in all sections of the country, these methods and tools have an especial interest. The practice of hitching several teams together under one driver, of coupling two or three wagons together, and of hitching four head of stock to one scraper to secure greater efficiency has, I believe, played its part in the evolution of some of the California road machinery. Certainly this practice has played its part in developing the Fresno scraper and the gang rooter plow. To plow up our roadways in order that the scraper, road grader or tamper may be used, we use a five-gang rooter plow by which the work is done for at least one-fifth the cost of plowing up a roadway by any of the usual methods. A gang rooter overcomes all of the objections to the single rooter plow. It keeps its place without being held; it maintains a constant depth; it never jumps over or around any area; it pulverizes as well as tears up. A second plowing is unnecessary. Two men with either an engine or about twelve head of stock can handle it. It is also used as a cultivator and as a scarifier, particularly where the work is too heavy for any ordinary cultivator, as in scarifying a hard asphaltic or macadam surface.

All road surfaces need repairs sooner or later, and the asphaltic surfaces demand especially adapted tools to loosen them. What is known as the spike disk cultivator has been developed to meet the need of a cheap and efficient scarifier, which should be a horse-drawn machine, and should loosen the top without disturbing the bottom courses. The machine rapidly picks to pieces any asphaltic surface so that the road grader can be used upon it to reshape it, or so that new material can be successfully bonded to it.

California's practice is to scarify a surface of from three to five years old which has become filled with holes or ruts, reshape it with a road scraper, thoroughly wet it and either tamp or roll it until smooth. Very seldom is it necessary to add any new material. The ease with which a road built of California asphalt can be remade accounts for the low cost of maintenance of California roads and streets.

I believe that many of the asphalts and tars now being used throughout the country could not be reworked after they had been down for two or three years.

Probably the most interesting machine resulting from the California experiments with oiled road building is the tamping roller. It originated in the attempt to simulate the action of a sheep's foot in compacting loose earth—and today, after many experiments with various forms of tamper feet, the one which is the shape of a sheep's foot is demonstrated as the most practical.

The tamping roller is a most efficient machine for compacting earth or stone roads or foundation for all kinds of pavements. The tamping roller is designed to consolidate a foundation to a greater depth, tensity and uniformity than is possible with a smooth or even a grooved roller. Smooth, grooved, or corrugated rollers compact only a very thin layer of the surface. Since the pressure exerted by a roller decreases as the cube of the depth, the pressure exerted by any roller extends but an insignificant distance down. The tamping roller overcomes this difficulty by solidifying the mass from the bottom up. To compact a sub-grade, it is first plowed, then pulverized with a spike harrow, after which the tamper is set in motion and immediately and continuously followed by a cultivator in order that the tamper may sink to the hilt and that the top surface may be prevented from solidifying while the bottom strata are being solidly tamped.

When a bottom stratum is solidified, the tamper may be allowed to ride higher. This is effected by setting the cultivator to a shallower depth. Finally the tamper may be allowed to ride upon the surface and the test of sufficient consolidation is that the blow struck by the falling of the tamper feet shall produce no quaking of the surface stratum. The tamper, unlike any other form of roller, produces its own test of effectiveness and produces a thickly compacted layer uniform in density, both laterally and vertically.

When it is realized that the only object of a sub grade is to distribute wheel loads, it is easily seen that it is cheaper to consolidate a good sub grade than it is to give additional thickness to any form of pavement. It will cost not to exceed four cents per square yard of surface to consolidate a sub grade six inches in thickness. Reduce the thickness of any pavement even two or three inches and not only is economy practical, but a more scientific construction is obtained.

Why use expensive materials for a foundation when its sole use is to distribute wheel loads—the wearing surface should perform the other requisites, namely, water shedding, wearing qualities, and dustless qualities.

* * *

New Yorker (to Pat, just landed).—You never saw such tall buildings as these in Ireland, did you Pat?

Pat (not to be astonished).—Faith, yis! In Ireland the top stories of some of the buildin's are on hinges so they can be let down whin the moon goes over.—Exchange.

Ruminations and Cogitations

By F. W. FITZPATRICK

At the opera the other night I saw the villain, in an eleventh century plot, strutting about with a Smith & Wesson hammerless revolver stuck in his belt; on our fashionable streets we see Venetian palaces, that naturally recall canals and gondolas and such settings, doing duty as individuals in solid rows of houses, or perhaps more common still, you'll find sections of Gothic cathedrals or Byzantine Basilicas masquerading as "fronts" of apartment houses or office buildings. You'll see huge picture hats upon small women and vertical lines of trimming or other decorations and embellishments that accentuate height upon tall ones; whichever way you turn your eyes the sense ot balance, of the artistic, the proper caper, is offended by glaring and all too often monstrous incongruities. But it is a condition of all times and climes. Some of the grandest works of the old masters hurt one by representing the Virgin Mary, for instance, holding a prayer-book of the vintage of 1500 A. D.

Our art is replete with incongruities, our speech, our mode of dress, our code of morals, everything about us or that we do, seem to be, unthought out, settled upon haphazard and without any real knowledge of the subject, merely because some detail takes our fancy. Why, it is a wonder to me that some of our beaux do not turn up at our swell functions arrayed in evening clothes, yellow shoes, red ties and pink shirts.

Perfection is not expected, it may be aimed at, but we know it is unattainable, but we do clamor for a little less imperfection. In matters of art at least, where men are supposed to study and travel and to know things, our architects should seek to lead us into the observance of anyway the first principles of balance, doing things as they ought to be done, and refraining from adding further incongruities to the absurdities we have already perpetrated in the names of Art and Progress.

* * *

We Americans have carried "technical points to absurd extremes, indeed have we not reached the limit in such abuses? Technical recesses for our Congressmen, that they might collect travel expenses without travel, technical observances of certain laws during their actual infraction, and what not. As a matter of fact, in so far as our Justice (?) is concerned, we are the laughing-stock of all Europe. Today it is no longer a question with us as to whether a thing is right or wrong, all that is necessary is to employ a shrewder, more unprincipled lawyer than the other fellow and we are sure of success in our courts. In these the administration of Justice has become a travesty, a farce, a crime in itself. They are purely law-shops where verdicts and privileges are bartered for superlative cunning, or law-schools where embryo sharp-practitioners may learn how to do the trick. Just verdicts are reversed because of a misplaced coma in a brief or because the offending attorney did not wear the right colored tie at a certain moment, murderers are acquitted because of an error in the technicalities of a charge, the truth is suppressed and falsehood is accepted—on technical grounds. Why, to the layman it would seem that the technical frills of the law take the place of the Constitution, Justice, Right, and all, technicality run amuck.

An Attractive Pergola of Concrete and Cement Plaster

Garden Pergola of Concrete

Inexpensive Homes of Reinforced Concrete*

By MILTON D. MORRELL, Architect.

WHAT architectural style are we developing today? The Greeks developed the lintel type of architecture, following the natural shapes and sizes of available stone. The Romans built mostly in brick and developed the arch as a natural form for their material. What new type and style will be developed through the use of reinforced concrete? There must be a concrete style. We have already worked out the structural forms which seem best suited to the material, and possibly the best concrete buildings have been designed by engineers, as they have followed the simplest and most logical shapes, and have not been hampered by architectural precedent.

We architects are so wedded to traditional forms, such as cornices, columns and arches, that we are likely to employ these in positions where they serve a decorative rather than a constructive function. Is there any reason why structures cannot be designed in the simplest and most natural forms for concrete, and still be beautiful in proportion, line and color? Cannot honest construction be made decorative and beautiful without requiring a masque of false architectural detail or an imitation in materials?

It has seemed to me that in cement work we have been designing in styles suited for wood or brick, and constructing in concrete with shapes unsuited and unnatural to the material in hand. This has, of course, made work difficult and expensive. On one design for a seven-room house with large living room a contract figure was given as $5,500. A frame structure could hardly be built for less.

The science of living has been given little study, and many of us consider carefully in our work how we can economize in labor. But in our homes there is a great waste of effort and energy through unstudied plans. Upon studying the problem of housing, I found that a box house was by far the most economic form which could be constructed enclosing a given space, as this form requires the least wall area. The box is also the most rigid and substantial, as is illustrated by those of pasteboard in daily use. While of a fragile and flimsy material, these become firm and substantial when reinforced at the corners. The idea of a box shaped house is not attractive to us, but why cannot this form be made beautiful? We see carved and decorated jewelry cabinets, which are exquisite, why can we not design attractive homes within similar lines, being guided more by the law of common sense, fitness and beauty than by precedent, in following an architectural style, which at best cannot be suited in structural forms so changed.

In all our cities contractors are building rows upon rows of houses, and in the majority of cases plans are not furnished by leading architects but they are bought from the man who will make them at cheapest price. Contractors will employ the best doctor they can find for their families, but in these building operations, the best architects are cut out because they cannot compete with unstudied and inferior work, and the public must see and live in these buildings which are not beautiful, and sometimes even offend the eye. I believe that all our cities should have art commissions which would pass upon designs for fitness of appearance just as our health departments demand sanitary plans.

There are certain limitations to the economic use of concrete and we might as well recognize these and design our work accordingly. When we come to intricate detail and curved surfaces concrete work becomes difficult,

*Paper read before the National Association of Cement Users.

on account of the necessary moulds. Simple straight lines are ideal for this work, and after all they make the simplest and most attractive buildings.

I have adopted in all plans standard unit dimensions, so that drawings are reduced to mould diagrams after we have the design, and if we follow our diagrams the building is bound to come out right. One of the plans is so arranged that it can be built in sections almost as a bookcase is put up, being complete in four, five, six and seven room houses and arranged so that any number of rooms to twelve can be made or added with no alteration. For a group of those houses the fireplaces, stairways, ice-boxes, sinks, etc., are of a standard type and in steel moulds are made at a quarter the cost of our less substantial wood fixtures.

As before mentioned, a competition for sanitary inexpensive workman's homes was held at the late International Congress on Prevention of Tuberculosis, when this house was awarded the first gold medal. The following are a few of the special and for the most part new features which have been incorporated in the design:

The roof is of open cellular construction, cool in summer. An attractive feature of the house is the roof garden and sunroom forming out-of-door bedrooms, divided by use of movable screens.

Window-boxes form an inexpensive and at the same time artistic decoration.

We cast our walls for two-story buildings six inches in thickness, and you can realize how far a cubic yard goes in this thickness. With the steel moulds we can place this for $5 per yard, so that a wall 9 x 12 feet the side of a room, will cost but $10.

When the model house was first shown there were many skeptics as to the practicability of this scheme, and I thought that the best plan was to construct a house along these lines as an ocular demonstration as the only way to give definite proof.

A house of this character is in Brentwood, Maryland, near Washington. It has very little wood except the windows, sash and doors. The walls are 8 inches in thickness, the floors are 4½-inch slabs, reinforced. The moulds were of wood made in standard sections. One carload of Portland cement sufficed for construction. To thoroughly clean a room a hose is used, the cement floors being graded to plugged tile spouts, discharging on the lawn. An enclosure for the garbage pail is left under the wash tub which has an outside screen door for ventilation and removal. This is arranged to be flushed out. A small wood strip is laid in the border so that rugs or carpet can be tacked in place, if desired. All corners are coved, and all fixtures are bracketed from the wall, which leaves no places for the shelter of dust, vermin or insects, and facilitates cleaning. The possible omission of insurance and repairs and their general indestructible character makes this type of building especially suitable for rented houses. The waste from the kitchen range heats the house through circulation of hot water, being so built that in summer an inside fire-box cuts off the house heating system. All fixtures, such as kitchen range, sinks and wash tubs, lavatory and bathtubs are cast in concrete, and give a very smooth cement finish. For the water supply a concrete tank is built in the top of the bath room which is filled from a small force pump at the kitchen sink.

It is difficult to base an estimate of cost on construction of the first house, since the moulds and the superintendent's time have been charged against it, but it is safe to estimate that these houses can be built in groups at between $200 and $300 per room. In the construction of concrete houses, I have found that in some light work the cost of lumber and carpentry labor for moulds was three-fourths the total cost. It is necessary that this estimate should be reduced or eliminated, as we are to build in this material.

I searched the market in this connection, for standard sectional steel mould equipment and found several good types, but none suiting my requirements. The simple equipment used is the result of many months experimental work, and should, I believe, do much to reduce the cost of concrete construction, since it practically eliminates carpentry and lumber waste. The mould plates are pressed from No. 12 gauge sheet steel into flanged sections 24 inches square. Upon the completion of the footing course the plates are locked to the cement spacing blocks, furnishing a trough, into which the mix is poured. The cement spacing blocks are of course left in the wall and the plates are locked to these by a key, which is afterwards removed. Wherever four corners join, a cuff engages, wedges the plates together and draws them to perfect alignment on the inside. The whole stands very rigid and firm when erected, and in experimental work I have not found it difficult to keep work plumb, as the corners give alignment. The plates are two tiers in height, each tier being clamped together in series, and attached by a hinged rod so that the lower tier is unlocked and swung to its new position on top and locked, there being few loose parts to fall. The whole equipment for house construction has only ten parts and as it costs about $800 and can be used indefinitely, the cost per house is not great. Several small sections of walls have been built with this equipment, and within two weeks I expect to start on the first work for which a full equipment is now being finished.

The plates are locked together in the same way for the floors. The spacing blocks here give the exact thickness of slab and reinforcement rods are placed and accurately secured to these blocks by bedding a heavy wire which is cast in each block and protruding for this purpose. To give a smooth and even floor surface a wet mix is poured in, and the plates are slid in place on top and locked to spacing blocks, and wedged down until the surplus mix is squeezed out in front; this should do away largely with expensive labor in cement finishing. For the floors cement spacing blocks are cast with projecting flanges so that they will give considerable support to the slab and reinforcement and permit the lower plates to be removed after three days. A post being wedged and blocked up under each spacer giving supports only 24 inches apart.

I have found upon experiment that a slight ridge or pattern was formed by the joining of the mould plates and spacing blocks were found to show of slightly different color. I have treated this as wall decoration, and with the rosettes cast on the spacing blocks, an extremely interesting pattern is formed, and it is possible to leave the wall without further finish inside or out, unless a brush coating is applied to give a more uniform color, and as a safeguard against dampness. As the plates are cleaned and greased each time they are raised, and as the concrete is very wet mix, no plaster is required.

* * *

An Experiment in Co-operative Architecture

The completion of an apartment building now in course of construction in Boston will be awaited with some interest.

It appears that the joint owners, eight in number, will each design his own apartment, specifying all details of number and arrangement of rooms, style of interior decorations, and furnishing and finish. The building is to be nine stories high, and is estimated will cost in excess of $250,000.

While, "in a multiplicity of counsellors there is much wisdom," it is equally tritely stated that "too many cooks spoil the broth," not to overlook the oft-quoted maxim that "the man who is his own lawyer has a fool for a client."

Design of a Shelter for an Antique Monument. Awarded First Mention
Joseph Gould, Designer

ARCHITECTURAL LEAGUE OF THE PACIFIC COAST (Official)

Officers for 1910.

President,
Alfred F. Rosenheim,
Los Angeles, Cal.

Vice-President,
E. F. Lawrence,
Portland, Ore.

Secretary,
John P. Krempel,
Los Angeles, Cal.

Treasurer,
W. R. B. Wilcox,
Seattle, Wash.

Jury,
John Galen Howard
Louis C. Mullgardt
Loring P. Rixford
George W. Kelham
John Bakewell, Jr.

Education Committee,
E. F. Lawrence, Portland, Ore.
David J. Myers, Seattle, Wash.
Myron Hunt, Los Angeles, Cal.
Robert Farquhar, Los Angeles, Cal.

NOTE.—The members of the Jury are also members of the Education Committee.

Next Convention—Los Angeles, Cal.
Next Exhibition—Portland, Or.

RESULTS OF COMPETITION WORK FOR MARCH-APRIL

Student Work.—All mentions are credited by the Society of Beaux Arts Architects, New York. First mentions and medals must be confirmed by the New York Society before being credited by them.

Order Problem: Subject, "Shelter for Antique Monument."

Name.	Award.	Atelier.	City.
P. W. De Louchant	First Mention	Nicolais	Reno, Nev.
Joseph Gould	First Mention	Brown	San Francisco
E. M. Damon	Mention	Nicolais	Reno, Nev.
F. S. Allen	Mention	Portland A. C.	Portland
Louis Losenberg	Mention	Portland A. C.	Portland
W. G. Hathaway	Mention	Portland A. C.	Portland
George Conrad	Mention	Seattle A. C.	Seattle
H. M. Jackson	Mention	Seattle A. C.	Seattle
William Sherman	Mention	Brown	San Francisco
E. L. Frick	Mention	Brown	San Francisco
C. I. Harrison	Mention	Brown	San Francisco
Harry Michelson	Mention	Brown	San Francisco

Plan Problem (Class B): Subject, "A Grand Stairway."

George Bearwald	Mention	S. F. A. C.	San Francisco
F. R. W. Jones	Mention	S. F. A. C.	San Francisco
Ed. Flanders	Mention	S. F. A. C.	San Francisco
J. W. Bagley	Mention	S. F. A. C.	San Francisco

Shelter for an Antique Monument. Awarded First Mention
P. W. De Louchant, Designer

Concrete Columns, Girders and Slabs Cast as Shop Made Concrete-"Lumber"

MANY people interested in concrete work have prophesied that in the near future we shall witness the construction of houses and larger buildings by the assembling and erection of shop-made concrete "lumber." A novel system worked out along this line is being used in the East, under patents held by W. S. Shourds of Philadelphia. In brief, it consists in casting, in the shop or on the work, the studs and girders called for by the plans. Some of the reinforcement is placed at the time of casting the members and deep grooves are molded in the units to receive additional reinforcement at the time of erection. The studs and beams are assembled on the job and the frame is erected as a steel or wood frame would be. The members are tied together by attaching their reinforcements.

The walls of the building are composed of concrete slabs, cast on sand beds in simple wood forms. The surfaces are left rough, to receive the stucco finish which is one of the main features of the system. The slabs are tied to the beams and studs. The additional reinforcement is then placed and covered with cement grout, which bonds the whole into a practically monolithic mass.

Nailing strips are cast in the beams and girders for the attachment of furring strips inside the building. The application of plaster on the inside results in a hollow wall.

The columns and studs are cast in molds formed of steel T-beams and the groove for the reinforcement is made by a special tool. The slabs are cast in a wood form, as stated.

The form is made of oak 3 inches thick and 1½ inches wide, covered with galvanized iron. The side pieces are 10 feet long, and the cross pieces 31½ inches. One form will mold eight slabs at a time.

It is operated as follows: A bed of sand or fine gravel is leveled off and thoroughly wet. The form is set up. Four pieces of wire (No. 14, about 8 inches long), bent in the form of a staple, are stuck in the sand bed, points up, two at each end and two about 8 inches from each end of the slab molds. The form is then poured full of concrete, lightly tamped or troweled into place and struck off. As the concrete settles into place much of the excess of water seeps away through the sand bed. The balance rises to the top and is swept away when the mold is struck off. The surface is left rough. If the nature of the aggregate is such that the scraper does not leave the surface sufficiently rough, pebbles or broken stone should be thrown on it.

If the concrete has settled into place, the form can be removed at once. The clamps are taken out with a hook and the side pieces are lifted off. The cross pieces are taken out and the slabs are left on the sand bed to set and harden. They can be taken up in four or five days.

The studs are set up on the foundation, properly bedded, plumbed and secured in position with temporary wooden braces. The steel reinforcement is then stood in the grooves, and the first course of slabs set and temporarily held to the studs with pieces of wire. This wire is hooked into one of the wire staples in the slab, carried around the back of the stud, and hooked into another staple. The slack is taken up with a wooden wedge. Thin cement mortar is then poured into the groove, joining stud, slab and reinforcement into one solid monolith. Each course is laid up in the same manner. Previous to filling the groove, the stud and slab should be thoroughly wet to secure adhesion. When the mortar in the groove is set, the temporary wires are removed.

At each floor beams are run around the building to carry the horizontal reinforcement and support the floors. They are laid on the tops of the studs, the reinforcement laid in the groove, and the groove and space between the ends of the beams filled with the same mortar used to fill the studs.

The rough surface of the slabs is suitable for the stucco finish. It cannot swell and break the key, as do wooden lath. This wall depends on its mechanical bond alone to hold firmly all the stucco applied.

Only one coat is necessary, the slabs themselves taking the place of the scratch coat. The wall is thoroughly wet before applying and the stucco is not permitted to dry too quickly.

With the half-timber work, the boards are put on before the stucco, being nailed to wooden or metal plugs put in when the slabs were laid up.

Ornamental panels of any size can be used in the wall at slight additional expense. They can be cast either face up or face down, with equal ease. Burnt clay products, either glazed or unglazed, in a great variety of shapes and colors, can be used effectively. White and colored marbles, ornamental iron work and even pieces of colored glass can be used to advantage. The ability to cast and decorate the panel in a horizontal position appeals to the builder.

Many advantages are claimed for this form of construction, which has attracted the attention of architects and contractors. It is a system which is low enough in cost to appeal to the home builder and will doubtless meet with favor in this field.

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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Architectural League of the Pacific Coast

Next Convention, Los Angeles

OFFICERS FOR 1910

President...............Alfred F. Rosenheim, Los Angeles, Cal.
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Louis Hobart Busy

Quite a little interest is being taken by the members of the architectural profession in the newly-incorporated town of Hillsboro. just outside the boundary lines of Burlingame, which latter town has heretofore been the rendezvous of San Francisco's elite. With the birth of the new town has come the announcement that at least three of its wealthy members will build costly homes, involving a total expenditure of something like $1,000,000. Architect Louis P. Hobart has been engaged to prepare the plans for all three residences, the owners of which are Henry T. Scott, Joseph D. Grant and Alexander Hawes. A new clubhouse to replace the one burned, is also being designed by Mr. Hobart.

Completion of the London-Paris Bank

Another of San Francisco's new bank structures has been completed — the Anglo and London-Paris national bank, at Sansome and Sutter streets, Albert Pissis, architect.

The building occupies a space of 46 feet 10 inches on Sansome street and 122 feet 6 inches on Sutter street and is as high as an ordinary structure of three stories. The exterior is of finely cut white granite of the Doric style of architecture. The columns are fluted and monolithic and the cornices richly decorated. The entrance is of bronze. The banking room occupies the entire first floor, the upper stories, which are hidden, being for the book keepers. It is 36 feet high, with vaulted sides and paneled ceilings, the whole decorated with stucco and tinted in a soft gray, the effect being greatly enhanced by the bronze light fixtures suspended from the ceiling and from the side walls. The enclosure around the public lobby has counters of excalette marble and the upper part a bronze colonnade with the necessary wickets.

The floor is of white marble, with a colored border, in which bronze is inlaid. Two large vaults, faced with the same quality of marble as the lobby, occupy the rear of the banking room. At the left of the entrance are the offices of the officers, the remainder of the lobby being devoted to tellers, etc. A spacious safe deposit department occupies the eastern portion of the basement. Its entrance is from the banking room.

The Seattle Exhibition.

The exhibition of the Architectural League of the Pacific Coast, held in the rooms of the Washington State Art Association at Seattle, under the auspices of the Seattle Architectural Club, was an unqualified success. Fully 1,000 friends of the patrons among the architects, builders and material men, responded to the invitations sent out. Attendance was well worth while. The hall presented a cheerful and interesting appearance. Rug-covered benches occupied the several alcoves and bay trees and greens forming backgrounds for sculptures, helped in a delightful setting for the hundreds of drawings and photographs displayed. The work shown was taken from the offices of leading architects in the Northwest besides many drawings by Eastern members of the profession.

Fairfield's New Court House.

Architects E. C. Hemmings and W. A. Jones are taking bids for the construction of the new $350,000 court house, which is to be erected at Fairfield.

The architects have designed a strictly Class A building and only fireproof materials will be used in its construction. A quantity of expensive marble, tile and mosaic will be used on the floors and wainscot.

Complete plans and specifications can be obtained from the offices of architects Hemmings & Jones, 1005 K street, Sacramento.

Engineers and Architects Association

Halley's comet was the subject of an entertaining lecture delivered to the Engineers and Architects Association at its April meeting in the Hollenbeck hotel, Los Angeles. Nearly a hundred were present, including the wives of members. B. R. Baumgardt was the lecturer, and his talk on the comet was illustrated by stereopticon views. That the head of the comet is a nebulous mass and its tail an electrical phenomenon produced by its near approach to the sun, were some of the assertions made by the speaker. That the earth will pass through the tail of the comet he regarded as very probable, but the chance of any ill effects on the inhabitants of this globe as very remote.

Architect A. F. Rosenheim, the new president of the association, presided. Customary routine of business was not taken up.

Builders Subscribe to Exposition Fund

The San Francisco Builders' Exchange has subscribed liberally towards the Panama-Pacific Exposition, to be held in San Francisco in 1915. A special meeting to raise funds was held recently.

Mr. James A. Wilson acted as auctioneer and, armed with a carpenter's hammer, he called the meeting together and started matters off with a song by the Knickerbocker quartet. The usual order of subscriptions was reversed, and the small amounts were called for first. The auctioneer enlivened the procedure with a running fire of wit and suggestions. At the close of the meeting over $20,000 had been pledged.

The result of the meeting was most gratifying. Taken altogether the members of the exchange have subscribed in one way or another more than $100,000.

Mohr Out of City Architect's Office

San Francisco's new city administration seems to be having its troubles. The appointment of Architect N. W. Mohr to the position of city architect appears to have been but a temporary arrangement for less han two months after Mohr was given the job it was taken from him, the new incumbent finding it impossible to work in harmony with the members of the Board of Public Works.

Mohr Prefers Charges

Former City Architect N. W. Mohr recently renewed his charges before the San Francisco supervisors' building committee, that the steel frame work of the Mission grammar school and of the Madison primary was so deficient in places that it imperiled the lives of the school children. The committee asked the board of works to investigate the matter.

President Casey of the board of works, who recently dismissed Mohr from the job of architect, laughed at the latter's allegations when first made recently, and said the schools were all right. He will, however, now have to give the charges serious attention long enough to make a first hand report to the supervisors.

"I called President Casey's attention to the dangerous condition of these schools, and the other commissioners as well, and for result I got—dismissal," said Mohr to the committee.

"As a citizen of San Francisco and one interested in preserving the lives of its children, if no longer as city architect, I must protest against neglecting this vital matter. I am not resting my charge that these schools are dangerous solely on my own judgment and inspection. Inspectors in the city architect's office have submitted detailed and specific instances where they found 'rotten' work and places where the upper steel girders could be swayed by a hand's pressure. I would be false to my calling and to my citizenship if I glossed this matter over. In a matter of this kind the city has no right to take chances."

Brown Declines the Honor

Architect Arthur Brown, Jr., of the firm of Bakewell & Brown of San Francisco, was prominently mentioned for the position of city architect, to succeed Mr. Mohr. Mr. Brown did not care for the position, but he told his friends that if the San Francisco Chapter, American Institute of Architects, would indorse the appointment, he would accept the place. The Chapter, however, could not very well do this, as its motive would probably be misconstrued by some as a piece of politics, and that would have worked inestimable harm to the society. Mr. Brown very wisely declined the proffered position with thanks.

Driving a New Winton

Architect Henry C. Smith is driving a handsome 1910 Winton touring car. Mr. Smith makes excellent use of the car in reaching his country place at Los Gatos. A year ago he purchased a number of acres of land overlooking the picturesque town and the construction of a beautiful country home there is well under way.

April Meeting of San Francisco Chapter, A. I. A.

The regular quarterly meeting of the San Francisco Chapter, A. I. A., was held at Tait's Cafe on Thursday evening, April 21st. After dinner, the meeting was called to order by President Mooser.

The minutes of the special meeting of March 17th and of the joint meeting of the Southern California and San Francisco Chapters held at Los Angeles on April 11th, were read and approved.

Mr. James W. Reid for the Committee on Entertainment and Reception, reported progress.

Mr. B. J. Joseph for the Committee on Legislation reported that at a joint meeting of his committee and the Committee on Legislation of the Southern California Chapter, Mr. Morgan of the Southern California Chapter had been elected a chairman of the joint committee and Mr. Joseph of the San Francisco Chapter, secretary; that the joint committee had decided to confine its efforts before the Legislature to the amendment to the law of 1872 on competitions and to submit the proposed amendment to an attorney for the purpose of having it properly framed; a copy to be sent to each chapter and the minutes of the meetings at which the matter is brought up to be exchanged and when adopted by the chapters, a joint meeting of the Legislative Committee of the chapters with the State Board of Architecture to be held to take final action regarding it.

For the Committee on Competitions, Mr. George B. McDougall reported that he had been made secretary of the committee, Mr. Mooser being chairman by virtue of his office as president of the chapter, in accordance with the circular of advice issued by the American Institute on March 30, 1910; that the committee holds regular weekly meetings at noon on Tuesdays and requests all members to report to it any competitions coming under their notice.

Mr. G. A. Lansburgh, for the Committee on the Revision of the Constitution and By-Laws, reported that the committee had completed its work and that the document as proposed would be printed and sent to each member of the chapter and that the matter would come up for discussion at a future meeting.

Messrs. Charles Paff, Rudolph A. Herold, William Demmond Coates, Jr., and Llewellyn B. Dutton were unanimously elected chapter members.

In regard to the communication received from the San Francisco Housing Association, it was duly moved, seconded and carried that the chapter join the association and that two delegates be appointed by the chair.

In regard to the resignation from the chapter of Mr. George T. Plowman, the president announced that there being no objection, the resignation would be accepted and it was so ordered.

In regard to the communication from Mr. Otto von Geldern, inviting the chapter to attend an illustrated lecture on the water supply of San Francisco, the secretary was instructed to acknowledge the receipt of same.

The following communications were ordered received and placed on file: From the Alameda School Board regarding proposed competitions; from the Attorney General, Governor and Mayor's offices regarding the Armory competition; from Hon. Julius Kahn, regarding the U. S. Sub-treasury; from Henry A. Schulze; from John Bakewell, Jr., regarding the Housing Association; from Glenn Brown, secretary, A. I. A., regarding competitions; from the Committee on Competitions of the A. I. A.; from the American Institute regarding the preservation of masterpieces of art; from the American Federation of Art regarding the appointment of a delegate to its convention; from the American Institute regarding the competition for the Galveston hotel; an announcement of the second national conference on city planning; from the Royal Institute of British Architects, an announcement of the town planning conference and from the Colorado Chapter, A. I. A., copy of the minutes of its April meeting.

The chair announced the appointment of Messrs. Bakewell and Joseph as the chapter's delegates to the Housing Association.

It was moved, seconded and carried that the chapter guarantee a certain fund to the Panama-Pacific International Exposition Committee, this fund to be subscribed by the various members and that a committee be appointed to ascertain the number of subscriptions and the amounts.

The president announced that there being no objection, the committee now representing the chapter in connection with the exposition would act in the matter of a subscription to the funds.

The chair announced that Mr. Schnaittacher, the chapter's secretary, had been appointed a member of the State Board of Architecture.

The guests of the evening, Mr. Mott from the east, and Mr. Tompkins of Australia, made brief remarks.

Bakersfield Court House

Contracts for the Bakersfield court house are to be let early in June. The plans by Architect Fred H. Meyer have been completed and call for a handsome building, three stories and basement, of Class A construction and estimated to cost $300,000. It is the intention to let the contract as a whole.

Architects Interested in Scheme for Panama-Pacific Exposition.

[From the Western Architect.]

The East has not as yet become fully informed as to the date, purposes, or scope of the "Panama-Pacific-International Exposition," at San Francisco, but the local architects seem to be active in seeking to shape its structural features along the best architectural lines. The San Francisco Chapter of the American Institute of Architects, probably urged by the publication of tentative designs of a mediocre character, have written the exposition officials asking for a consultation. The letter, signed by ten of the best among the many architects of high attainment in the city, received a cordial reception which may lead to the exposition buildings showing the best San Francisco can produce in architectural design. It is becoming more noticeable each year that when the architects of a city work together, not for individual or collective gain, but for architecture as a profession and the public advancement of art, that they are listened to with respect and appreciation by the people. It is only in cities where the profession is not united that architecture is uniformly commonplace, and where critics say "there is no architecture."

Los Angeles Glee Club

The Los Angeles Architectural Club has a glee club. At a recent meeting an enthusiastic organization was formed and regular meetings of the club are scheduled for practice. A piano has been added to the clubroom furnishings, which while it must be kept locked during the day to satisfy the rules of the office building in which the club has its quarters, is available any evening when members wish to practice or gather for a good time. It is desired to interest every member of the club who is musically inclined, in the success of the glee club.

Personal.

Morgan, Walls & Morgan is the new name of the old established architectural firm of Morgan & Walls of Los Angeles. The addition to the name is a recognition of an additional member of the firm, Mr. Octavius W. Morgan, son of Mr. Octavius Morgan. The firm has new quarters in suite 1112-16 Story building.

Architect W. J. Saunders has outgrown his office quarters and has added an adjoining room for the use of his drafting force. He is now occupying suite 511-12 Wright & Callender building, Los Angeles.

Claussen & Claussen, architects, announce the removal of their offices to suite 508-9, Macleay building, corner Fourth and Washington streets, Portland, Ore.

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POOR CONCRETE CONSTRUCTION

It is no secret that some inferior concrete work has been going on in San Francisco of late. There is no excuse for it either, and the only explanation appears to be the amazing zeal of certain architects to get the work, regardless of consequences. We would not be surprised to hear of another Hotel Bixby disaster any time. It will be recalled that it was at Long Beach that this hotel, now known as the Virginia, collapsed and killed a number of workmen.

From different sections of the country we hear, every now and then, of a concrete failure. With buildings properly designed and constructed there should be no such word as failure. Failure in concrete work means that someone has been derelict in his duty; that he has made a mistake in the selection of his aggregates, been too hasty or negligent in the mixing and placing of his materials, or that he is attempting to "skin" the job in the interests of economy. In the past four or five years the concrete industry has attracted to its ranks some of the most brilliant minds in the architectural and engineering field. With the flood of light which has been turned on the industry by these and other men failures are absolutely inexcusable.

GETTING RID OF UNRELIABLE CONTRACTORS

There is a movement to rid San Francisco of certain unreliable contractors who have sprung into existence since the fire four years ago. We hope those promoting the campaign will succeed, for there is no question but that this undesirable class of builders has worked incalculable injury to the contracting business in San Francisco. Just why reputable architects allow them to compete with the recognized firms of high standing is hard to understand. Some architects say their clients are to blame. Only the other day a leading architect asked us our estimate of a certain contracting firm that has lately entered the field as "experts in concrete construction." We told the architect frankly that the concern was absolutely unreliable, with no experience worth speaking about.

Another architect told us that he had been forced to give a firm about which he knew nothing, the contract on a $50,000 building because the man's figure was $5,000 less than a reputable competitor. The fellow's name was offered by the client, much against the wishes of the architect. Six months have passed since this contract was let, the job is still going along at snail's pace and the contractor has been caught repeatedly "skinning" his work. It has already cost the owner more than the $5,000 he thought he was going to save by giving the job to the lowest bidder.

Again, these irresponsible firms have nothing to lose if their work is a failure, while the reliable firm has its reputation at stake. If perchance the discredited builder does a good piece of work he invariably neglects to pay his bills. To "break even" he must owe everybody for his materials. As a result, the supply people have suffered not a little, and it is a wonder some of them have not been obliged to close down.

Fresno's Splendid New Hotel

Fresno's new hotel which is being designed by Architect Edward T. Foulkes of San Francisco, will be of reinforced concrete and will cost something over $200,000. A feature of the hostelry will be a spacious court, similar to the Palace hotel court, and covered with an art glass dome. A fan system will be installed with a special device in each room, assuring the guest of a cool night's rest in the hottest weather—and it gets pretty warm in Fresno during the summer months. Contracts for the erection of the building are expected to be let within the next thirty days.

Alameda School House Competition

Quite a number of architects submitted drawings for two school houses to be erected in Alameda at a total cost of $150,000. One building is to contain 20 class rooms and the other sixteen rooms. The competition was open to any architect of good standing in the United States.

Twenty-five Cents for Back Number

The publishers of this magazine will pay 25 cents for one or more copies of The Architect and Engineer, Vol. 16, No. 3.

A Pointer for Brick Men.

From an Exchange.

If you are selling brick and you are shown that a publication is read by a large enough number who specify and purchase brick to make the rate reasonable; if you are shown that they subscribe, pay for it, and read it because it furnishes them with information that they find essential to the proper conduct of their business, then that publication is entitled to your business.

The fact that you do not personally like it, or think it is uninteresting, or feel that it is wrongly conducted, or would run it differently if you owned it, or can not see why its subscribers think so highly of it, has nothing to do with the case. The readers of the publication are the judges; not you. In the face of the evidence in the case, your personal opinion is of absolutely no value.

A Pointer for the Cement Manufacturers

[From Cement Era.]

It is to be regretted that of the comparatively few cement companies which do any advertising in the journals of the industry, the majority pay little attention to the handling of their space in a manner to produce the best results. While they will pay experts to prepare attractive "copy" for farm papers, and women's magazines, and daily newspapers, they put their name and trade-mark in a small space in the cement journals and let it run without change from one end of the year to the other. There are one or two notable exceptions to this rule, and the results obtained by their campaigns are proving the truth of the statements we are making.

If the cement companies would take sufficient space to tell an adequate story, and fill it with good, strong, attractive matter, changing it each issue, they would find that, at least in a majority of cases, the direct results would justify the expenditure, to say nothing of the addition it would make to the bulk of missionary matter.

The fact must not be lost sight of, that every reader of a cement paper is not only a present purchaser of cement, but also that his use of this material will increase in proportion to the amount of instruction which is given him and the interest with which it is possible to infuse him.

Credit to Contemporary

The picturesque pen and ink sketch which appears at the top of the table of contents page of this issue, was drawn by Mr. A. Lancaster for the House Beautiful, to which publication we are indebted for the use of the cut.

HEATING AND LIGHTING

Indirect Lighting of an Automobile Salesroom.

By H. B. Wheeler in Illuminating Engineer.

THE increasing demand for automobiles for use in all classes of work and pleasure has necessitated the building of numerous garages and show rooms to handle the ever-increasing auto trade.

The Anderson Carriage Company, to successfully care for their patrons have recently erected one of the finest buildings in the country for the exclusive use and display of the automobile. The garage has all the up-to-date conveniences necessary for charging and repairing batteries, automobile parts, etc. The display room is one of the most beautiful and splendidly appointed electric show rooms in New York. Everything throughout is finished in white enamel except the side wall panels, which are light yellow. All panels in the walls and ceiling are surrounded by a border on the brown tinge. The style of architecture is of the Italian Renaissance period. The architecture, decorations and interior furnishings are beautifully shown in the illustration, which was taken by the light of the new indirect illumination.

The proper illumination of show rooms for displaying automobiles, accessories, etc., has always been a difficult problem to handle by direct lighting methods. When chandeliers, with various types of glassware, were employed, the lamps (especially since tungsten lamps have come into such general use) have stood out very pronounced, thus detracting one's attention from the cars displayed. With direct illumination, heavy shadows were cast, and certain parts and sides of the cars displayed appeared dark, hiding many of their graceful lines and fine points.

To overcome as much as possible the difficulties of exposed units and glare (but not shadows), beam ceilings were specified in the newer buildings. Behind these beams lamps and reflectors of various designs were placed. From the street this gave the salesroom the appearance of a long show window, and the results were fairly satisfactory until one came within. In examining an automobile it was necessary a considerable part of the time to face the exposed lamps, intensified by reflectors back or around them. This was a great annoyance to the prospective buyer, and even more so to the salesman who was compelled to work under these conditions the greater part of the time. Thus we see that, although when viewed from the street the display room was fairly well illuminated, when inside conditions were about the same as when chandelier lighting, with exposed lamps, was employed.

Indirect lighting in this installation

has entirely eliminated all of the above mentioned disagreeable features, such as exposed units, glare, shadows, high lights, etc., by spreading throughout the room a soft and even flood of light. No matter from what point the cars are viewed there always appears to be the same light. No shadows are cast and the highly polished surfaces are brought out on all parts of the cars with exactly the same intensity, which is impossible with direct illumination.

The engineering data and specifications for obtaining these results in illumination of this show room are as follows:

Main salesroom, size 44 x 55 feet.

Alcove, 10 x 10 feet.

Number of outlets in salesroom, eight.

Number of outlets in alcove, one.

Fixtures in salesroom, eight four-light, containing four 100-watt clear bulb tungsten lamps per fixture.

Fixture in alcove, one one-light, containing one 100-watt clear bulb tungsten lamp.

Watts per square foot in salesroom, 1.32.

Watts per square foot in alcove, 1.00.

Total watts, salesroom, 3,200.

Total watts, alcove, 100.

Average foot-candles throughout salesroom and alcove approximately 3.5.

E-100 reflectors were used in the salesroom. E-100 is a diffusing type of reflector.

Showing Reflectors, No Exposed Lamps Visible, in a New York Garage

E-200 reflectors were used in the alcove. E-200 is a concentrating type of reflector.

All reflectors are a one-piece glass reflector, with spiral and vertical corrugations, plated with pure silver, giving the most efficient reflecting surface known to science.

Top of reflectors in both salesroom and alcove, 30 inches from the ceiling.

The fixtures are of the bowl type, as shown in the photograph, the bottom of each consisting of open work. All bowls are lined with a golden colored silk, which allows sufficient light to be diffused through the open work to give the fixture a soft glowing appearance, which eliminates the dead effect so common in many large fixtures. The fixtures are finished in Roman gold, which blends very nicely with the interior decorations. The reflectors are placed within the bowls on a level with the top of same, and are entirely hidden from view. It will also be seen from the photograph that no exposed lamps are in sight.

Indirect illumination has not only proved satisfactory in lighting this beautiful new salesroom, but in banks, libraries, residences, hotels, art galleries, theaters and, in fact, any room or building where a soft and evenly diffused light, devoid of shadows and without glare, is desired, it has met with great success.

Why He Could Not Bid

A plumber received an invitation to submit a bid on work for an asylum, during the winter, and returned the following answer, which emphasizes the necessity of training more workmen:

"Gentlemen: I regret the fact that my firm is unable at this season of the year to submit a price on the plumbing at the asylum. I explained to Mr. ———, the engineer, that if the weather was severe we would be unable to secure sufficient number of extra plumbers to handle any additional work.

"We have quite a few conscientious, consistent Christian patrons who depend on us to administer to their ailments in the shape of repairs to their frozen luxuries. The National Plumbers' Union of Journeymen have long since stopped the supply of plumbers through their elimination of all apprentices and now we only have the "Old Originals" to depend on, and they are fast dying off owing to Gout and Delirium Tremens and other ailments incident to High Living and Not Enough Exercise.

"I have thought seriously of late of giving this plumbing shop away and going to work for the man I gave it to. My only reason for not doing so is the fact that I haven't any enemies that I wish to get even with, only lawyers, and if any of them were fools enough to accept it they would retaliate by bringing suit for damages; and I am afraid I would have a hard time convincing the jury that it was not malice aforethought.

"My only alternative would be to be sued as a poor person, and even then I would have to take the plumbing shop back in order to substantiate my claim."

Is the Bathroom an Extravagance?

ROBERT SHACKLETON, writing under the title "Extravagance and Cost of Living," in the Saturday Evening Post, says:

"Notice in the building of new houses or the alteration of old ones the number of bathrooms nowadays demanded as a matter of course. Not that there can be any objection to bathing, but, very much the contrary, in a multitude of bathrooms there is wisdom; yet, none the less, it is a striking development of expenditure for luxury, carried to a point undreamed of even so recently as ten years ago and very different from the Spartan ideas of the still earlier tin-tub era.

"And in this entire class of luxury there is a danger to be heeded. The degeneracy of Rome dates from the time when the citizens lavished fortunes on constructing baths and deemed the best use of their time was in the finical care of their bodies. No nation or individual ever suffered from keeping clean, but danger comes when care for cleanliness tempts on toward enervating luxury."

Except for the one who dreads to see Saturday night come around so regularly, nobody decries the development of the modern bathroom and its extensive use. At least one bathroom is a matter of course in every good house built today, and there are no small number of homes which have more than one. As a rule, the man who puts more than one bathroom in his home is the man who can afford two or more, if he desires them, without inflicting any hardship upon himself or any one else.

It is true that he may have more than the absolute needs of his family and dependents require, but he takes pride and pleasure in the ownership, and the installation of his bathrooms has benefited the merchant plumber, the journeyman, the wholesale dealer, the manufacturer and those required to handle and transport the various parts that go to make the entire bathroom.

The evolution of the bath and bathroom has been a matter of natural progress, the public tendency toward health and cleanliness and education through advertising and literature. The combination of these factors has resulted in a large volume of business, and while the cost of many necessaries and luxuries has steadily advanced, the cost of plumbing work and plumbing equipment has steadily dropped, so much so that almost every home builder considers at least one bath room to be within his reach.

Planning the Plumbing for Churches

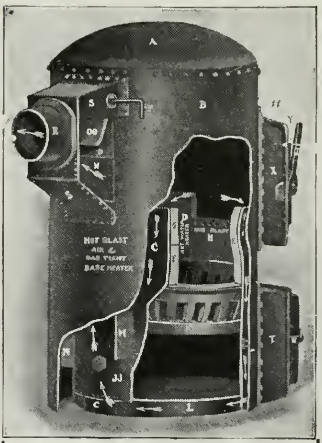
THE sanitation of churches is usually neglected. Perhaps on account of the limited use to which this class of building is put it has been deemed unnecessary, up to the present time, for any special provision to be made for the comfort and convenience of the congregation. There is no reason, however, why churches should be treated any differently in this respect than any other building where a large number of people congregate for a short period. Where such conditions obtain there should be a retiring room for women with toilet accommodations adjoining, and a suitable toilet room should likewise be provided for the men.

In view of the fact that church services, Sunday school, lectures and other church functions seldom last over an hour, as liberal toilet accommodations are not necessary as would be required for a school building, factory or any place where meetings last longer. Perhaps, everything considered, an allowance of one water closet for each seventy-five women, or fraction of that number, in the congregation, and a like allowance of one urinal and one water closet for every hundred men, or fraction of that number, in the congregation, would prove sufficient. At all events, this feature of church sanitation has been too long neglected, and later designs should not be found lacking in this respect. Of course, each toilet room would be provided with a lavatory, as is customary in all toilet rooms.

In addition to the general toilet rooms there should be a private toilet room for the officiating clergyman or priest, suitably located adjoining his private room.

The foregoing requirements are common to churches of all denominations. There are other requirements, however, which are peculiar to certain churches, while still others are matters of convenience, which may be included in or omitted from churches of any denomination

In Baptist churches, for instance, or other churches where immersion is practiced, a tank for baptizing is an important part of the plumbing installation. In such churches the tank may be built under the rostrum and slides placed in front so that they can be removed during the ritual of immersion to enable the congregation to witness the ceremony. Tanks for this purpose are usually of large dimensions, 8 to 10 feet long, 5 to 7 feet wide, with steps at one end leading down to the bottom. The tank may be



made of wood lined with sheet lead, as is the more common practice, or it may be made of cement, concrete or bricks, and lined with glazed tile. In either case provision must be made for heating the water to take off the chill when in use so the people who are baptized will not suffer too severe a shock from the cold water or run the risk of becoming chilled and contracting a cold. A dressing room, fitted with a lavatory, will be found desirable, if not actually necessary, for the disrobing and robing of those who are to be immersed.

In churches of many denominations sociables and suppers given for charity are matters of such common occurrence that in designing such a building those entertainment functions should be taken into account and a suitable kitchen provided with sinks, range and hot and cold filtered water.

In some churches water motors are used for pumping the organ, and when such is the case suitable outlets, both in the drainage system and in the water-supply pipes, should be provided.

Drinking fountains would not be amiss in church buildings and they may be located in some sheltered nook in the outer nave, in which case one would be sufficient, or separate drinking fountains may be located in the women's and men's rooms. In either event some type of sanitary fountain would be found preferable.

Lamp Posts as Architectural Structures.

TO what division of art does that which is applied to street lamp-posts belong? There are many valid reasons for classing it with architecture. Where the architecture of buildings on a particular street has some general uniformity there is little doubt that the design of the lamp-posts should partake of the architectural features of the buildings. In any event the design should possess the characteristics of strength, permanence and dignity, which are always sought for in public buildings. The word "lamp-post" is hardly adequate to characterize the modern street lighting fixture. By association of ideas the term suggests the makeshift and often ugly contrivances that have served in years past as some sort of a support for street lamps. The architecture of public buildings is always a source of much concern to a city, and so far as possible is the result of at least conscientious efforts to produce the best that can be secured. The lighting fixtures for business streets should equally be objects of careful study, and be unhampered by parsimony. A cheap, temporary or ugly street lighting fixture today has no place in any business thoroughfare.

Dr. Holmes sets forth in one of his characteristic short poems the necessity for a man having a good hat:

"Have a good hat; the secret of your looks
Lies with the beaver of Canadian brooks.
* * *
Virtue may flourish in an old cravat,
But Man and Nature shun the shocking hat."

To put up shabby lamp-posts in a well-paved street in proximity to buildings of modern architecture is of much the same order of incongruity as wearing a slouch hat with a frock coat. The difference in cost between what is good and what is "cheap" is never sufficient to compensate for the difference in the impression made upon citizens and strangers.

Architects and Clients Welcome

The Haines, Jones & Cadbury Co. are now permanently situated in their new quarters at 857 Folsom street, San Francisco. Their new showrooms are most attractive, the plans having been worked out by Architects Crim & Scott. The showroom is light and roomy and the various plumbing fixtures are displayed to excellent advantage. A number of fixtures are set up under water, so that practical demonstrations of closets may be given to the prospective client or architect. There are four handsomely furnished bathrooms and a number of toilets. The company extends a cordial invitation to all architects to visit the new showrooms with their clients.

By the Way

Some Industrial Information Worth the While

Charles Hoch Has Many Contracts.

Charles Hoch, mason contractor of San Francisco, has a building record to be proud of. Since the reconstruction of the city began four years ago he has erected more than seventy-five buildings. This is a pretty good indication that all the new work going on in San Francisco is by no means concrete. Mr. Hoch lays brick, and he is one of a score or more firms engaged exclusively in the same line. Some of Mr. Hoch's work has been of a pretentious character, notably the brick work on the new Bohemian club building on the northeast corner of Post and Taylor streets, Rixford & Kelham, architects. The exterior is an attractive red pressed brick with terra cotta trimmings. The building, when completed, will have cost more than $200,000.

The masonry work on the Maskey building, Havens & Toepke, architects, was done by Mr. Hoch, as was the brick work on the Goldberg-Bowen building, the Sing Chung building at California and Dupont streets, Ross & Burgren, architects; a three-story Class C building for A. B. McCreary, on Clay street, Paff & Bauer, architects, and a store and loft building for E. H. Kittridge, on the southwest corner of Stockton and Sutter streets, Clinton Day, architect.

Mr. Hoch's headquarters are in the Builders' Exchange building, 182 Jessie street.

New Lines for Waterhouse & Price

F. A. Wilcox, sales manager for Waterhouse & Price of San Francisco, Los Angeles and Portland, recently made a trip east, visiting many of the principal cities and calling upon the company's various eastern connections. Waterhouse & Price represent a larger number of eastern houses than any other Pacific Coast building material firm, and it was for the purpose of adding some new lines that Mr. Wilcox journeyed east. Among the new agencies that have been taken on is the James G. Wilson Manufacturing Company of New York, manufacturers of a high-class steel rolling door and shutter. A number of other equally good lines were secured, and a list of these will be given in the June number of The Architect and Engineer.

SOUTHERN PACIFIC COMPANY'S POWER HOUSE, OAKLAND
D. J. Patterson, Architect

"Puritan" Sash Cord

"Puritan" means quality in sash cord. It pays the householder to demand Puritan sash cord in his windows, and have them raise and lower as if they were ball-bearing.

The architect who specifies Puritan brand sash cord will be assured of the best.

The dealer selling Puritan brand sash cord builds up a name for quality. It is a hard, smooth finished cord, made of the best cotton and without defects. It is manufactured and sold by the Puritan Cordage Mills, Inc., of Louisville, Ky.

Successful Ornamental Iron Works

Among the San Francisco firms that have been eminently successful since the fire four years ago is the C. Farrenkopf & Sons Architectural Iron Works, 623 Minna street, San Francisco. The senior Farrenkopf was for eight years with A. Merle & Co., the well known ornamental iron and bronze manufacturers. With the thorough knowledge of the business thus acquired he formed a partnership with his two sons, both clever mechanics, and built the present plant on Minna street. The firm figures work in some of the leading architects' offices in San Francisco. It makes a specialty of ornamental iron fire escapes, stair rails and elevator enclosures. The company does splendid work in ornamental iron and bronze doors, a sample of which is to be seen in the door of Dr. Kugeler's house on Washington street, Ross & Burgren, architects, and which is shown in Mr. Farrenkopf's advertisement elsewhere in this issue.

An Ideal Gravel Mix

The Grant Gravel Company has found it necessary, on account of increasing business, to move to more commodious quarters in the Williams building, Third and Mission streets, San Francisco.

On account of the superior quality of the material the company is producing the demand for it is steadily increasing, and the firm has just completed a large plant at Eliot, near Pleasanton, with a capacity of 3,000 tons per day, which produces several qualities of gravel, sand and crushed rock.

One of the specialties of the company is the "Grant Ideal Mix," which is the result of numerous tests and practical experience, and is a mixture of perfectly clean gravel, sand and rock graded to the required size, which can be used as delivered on the job, and with the addition of only the cement it makes a concrete of the very highest quality and strength.

The San Joaquin highway commission has contracted for 15,000 tons of gravel from this company, to be used on the 238 miles of new roads which are being built under the recent $1,890,000 bond issue in that county.

A New Principle in Concrete Mixers

The Clover Leaf concrete mixer is now represented in San Francisco, by Boyd & Moore. The mixer gets its name, "Clover Leaf," from the novel construction and shape of the drum. There is an entire absence of wings, deflectors, or any other mixing mechanism. There are no outer angles or corners to pocket material, the novel shape of the drum—the "involute curve" alone making an absolutely uniform mix, simply and rapidly, and with a minimum of power. The "involute curve" drum construction is pictured on page 8 of this issue. The action of the cone-shaped ends of the drum causes a continuous movement of the material from the ends toward the center. In the "involute curve" principle, each curve, following in turn, causes a perfect "cut through and turn over" of the entire mass at each revolution, each time scattering the bottom over the top. The result is absolutely uniform, thorough, and rapid mixing. The drum can be cleaned out in the shortest possible time. A sample machine is on view in corner window of ground floor of McGregor building, Pine and Battery streets, San Francisco.

A New Weather Strip.

The Monarch Metal Weather Strip Company of St. Louis have appointed Boyd & Moore their sole representatives for California, north of Tehachapi, and for Nevada. This weather strip is a new departure, in that it is attached to the parting bead and accommodates itself perfectly to shrinking or warping of sash. It is practically invisible, and it prevents and stops rattling in spite of shrinking or warping of sash. The strip being attached to the parting bead, the weight pockets can be gotten at, and opened without removing the weather strip. It is exceedingly simple and thoroughly effective in excluding drafts and dust. It is a metal strip, running in a metal groove, thus avoiding the wear resulting from a metal strip running in a wooden groove. The metal used is pure zinc, thoroughly rust proof, and in use will last as long as the sash itself.

Splendid Catalogue.

The Los Angeles Pressed Brick Company has issued a handsome catalogue that is a credit to its publishers. The first edition was exhausted in a few days and a larger edition is now leaving the press. It contains a large number of handsomely engraved illustrations of the various lines of decorative and pressed brick, faience, ruffled brick, paving brick, hollow tile and other lines of high-grade clay products turned out at the company's large factories, together with valuable data concerning these products of interest to architects and builders.

In Record Time.

San Francisco has been rebuilt in record time, and to say that a man is a San Francisco builder invariably means he is a hustler.

Among the hustling builders of San Francisco Wallace C. Boswall holds a position well to the fore. Mr. Boswall has established a reputation for doing work ahead of time, and, as a consequence, he is in demand by the local architects. An example of the manner in which he works is to be found in the Laurel apartments, on McAllister street, a three-story and basement building, the frame of which was erected in twelve days' time. This building is second to none in the city in workmanship, and is a credit both to the architects and the builder.

Another of Crim and Scott's buildings built by Mr. Boswall is the Matthew Smith flats, on Ellis street, east of Larkin, San Francisco. The quality of the work was such that both of these buildings were leased before completion.

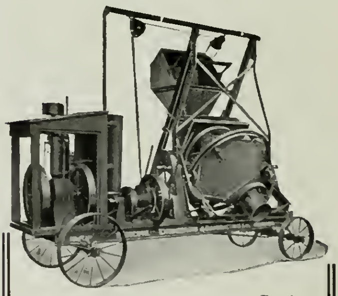
Mr. Boswall now has under way a large flat building on Clay street, east of Taylor, for the same architects.

Mt. Diablo Construction Company

The Mt. Diablo Concrete Construction Company has been incorporated and offices have been established at 185 Stevenson street, San Francisco. Men well versed in the handling of concrete work are at the head of the company which will specialize in concrete construction of all kinds. W. E. Charbonneau is president, E. Nelson is treasurer and F. E. McCoy is secretary. The company's slogan is "One good job deserves another." Several good contracts have already been taken, one of which is laying new concrete walks for the town of Burlingame.

Personal

J. Cather Newsom has formed a partnership with I. E. Frary, with offices at 319 Central Bank building, Oakland.



At the Beginning of Things. Site of the Vallejo Brick & Tile Plant

Splendid Plant of the Vallejo Brick and Tile Co., Consolidated

By E. M. Whitney

THE plant of the Vallejo Brick & Tile Company, Consolidated, is situated about one and one-half miles north of the city of Vallejo, in Solano county, California, and has a water frontage of over 1500 feet on Mare Island Strait. It is located on a point of land which was known in the Spanish days and records as "The Embarcadero" and was "the place near the channel for the shipment of hides and tallow." This water way is now kept open by the United States government on account of the Mare Island navy yard and is navigable by the largest deep sea-going vessels. It affords at all times of the year a cheap and easy means of transportation direct to San Francisco, Oakland, Alameda, Berkeley and all bay points, as well as to Sacramento, Stockton, Napa, Petaluma and intermediate points, including most of the larger towns of Central California. The Southern Pacific Railroad line to Napa and Sacramento is only a short distance from the plant and a spur track will be built at any time the business demands it.

The property consists of fifty acres of upland and about eleven acres of abutting tide lands. The shale from which the bricks are made, outcrops on the water front in the form of a low bluff about 25 feet in height rising at a moderate slope backward to the brow of the hill at the rear of the property, reaching an elevation at this point of about 110 feet above water. The contour of the ground is exceedingly favorable for cheap handling of raw and finished product by gravity, from the raw material in the clay bank through the grinding and mixing machinery to the kilns and then to barges or schooners on the water front.

Class and Quantity of Material.

The shale from which the bricks are made is known as a "Kidney Shale." The main body is a deep blue in color and this is overlaid by from ten to forty feet of yellow shale interspersed with layers of a soft sandstone. A test hole close to the machinery building at the waterfront shows that the blue shale attains a depth of 74 feet at that point while the yellow shale crops all the way from the water-front to the top of the highest elevation. A report made by the firm of Smith, Emery & Company estimated that the fifty acres of upland is overlaid by a body of shale sufficient to run a plant with an output of 20,000,000 brick per year for a vast period of time. A mixture of both kinds of shale with some of the sandstone is found to give the best results.

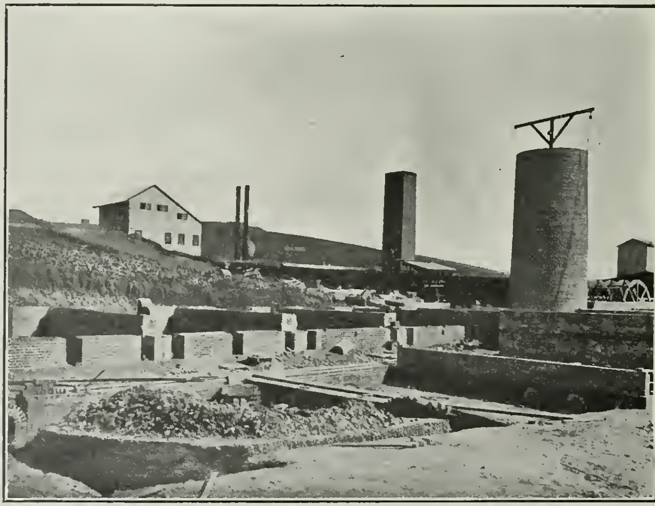
An analysis of this shale shows that its composition is almost identical with that of the "Canton Shale" from which the justly celebrated "Metropolitan Paving Brick" is made at Canton, Ohio. The city of Cleveland is largely paved with these bricks and it is said to be the best paved city in the United States.

The principal ingredients of these shales are silica and alumina with smaller percentages of iron, lime and magnesia.

It may be well to digress here for a moment for the benefit of the uninitiated. It is well known that the absolutely essential qualities of a paving brick shale is its ability to "Vitrify." This word is taken from the latin "Vitrum" meaning glass, hence, vitrification is the process of converting into glass by heat and fusion.

Most clays and shales have this quality but the trouble is that as soon as they begin to vitrify they likewise begin to melt. In order to make a first class paving brick it is necessary to have a material with a sufficient range of temperature between the vitrification and melting points so that the heat can be

Shale Bank in Rear of Plant, Vallejo Brick & Tile Company



Foundation for a Sixteen Chamber Kiln

Part of Vallejo Plant from Water Front

maintained until complete vitrification takes place, without melting the block. To melt the block is to ruin both form and texture. By mixing the shales above mentioned a product is obtained at which incipient vitrification begins at a well defined temperature but the melting point is not reached until nearly 100 degrees more heat is applied. Thus, complete fusion is obtained by slowly raising the temperature and maintaining it between these two points and then by slowly, cooling the mass, a process of "tempering" takes place similar to that obtained in tempering steel. The resulting paving brick has the hardness of glass combined with an extreme toughness and is conceded to make the best, the most satisfactory and, all things considered, the cheapest and most enduring pavement known. It can easily be imagined that shales having this quality are very scarce on the Pacific Coast and especially within easy reach of such large and growing centres of population as cluster about the Bay of San Francisco.

Machinery.

The machinery at this plant is designed to make wire cut brick by what is known as the "stiff mud" process. The shale is dumped into the dry pans and ground fine, then mechanically elevated to bins, then dropped into the pug mill, where it is mixed with just the right amount of water; then to the brick machine, where it is forced hot through the die in the form of a long, square-cornered column. This squared column of still hot clay then travels under a miniature "ferris wheel" and is cut by wires into brick size. These soft bricks are then put through a repress, where the rounded corners and lugs are given them.

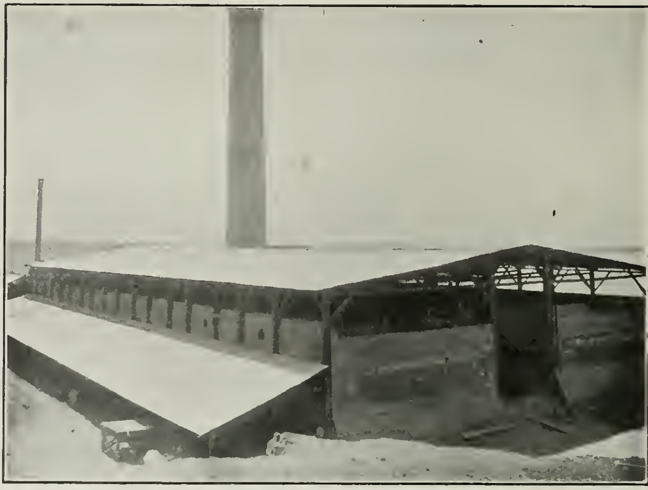
From there, loaded on cars of 500 bricks each, which are put through the long tunnels of the dryer and are taken direct to the kilns, where the bricks are stacked ready for burning. After the bricks are burned and cooled, they are discharged from the kilns and loaded for shipment or taken to the yard where they are sorted and piled.

Kilns

The vitally important adjunct to the equipment of the paving brick plant is the kiln. On the kiln depends the quality as well as the quantity of product produced. This plant is equipped with a round 30 foot kiln of the "bee hive" type and a 16-chambered continuous down draft kiln. Each chamber holding 35,000 bricks and the plant is designed to produce 60,000 bricks per day, running single time, the present kiln capacity being upward of 900,000 bricks per month. All kilns are lined throughout with fire bricks of an extra fine quality made in the plant and burn crude oil for fuel.

Fuel and Water

The fuel used on this plant is crude oil which is brought by a steamer to the company's wharf and pumped through a six-inch main to a large storage tank placed on the top of the hill on the rear of the property. The oil is brought by gravity to the boilers and to the kilns. This fuel is about one-third the cost of the cheapest coal and is easily and cheaply handled and eminently satisfactory.



Sixteen Chamber Kiln in Operation

Finished Product

A large number of tests made on the paving brick turned out by this plant by Smith, Emery & Company, as well as the city departments of both San Francisco and Oakland and by the United States government at the navy yard, Mare Island, show the brick to exceed the standard requirements by more than 100 per cent. In addition the company has its own "rattlers" and makes abrasion and absorption tests for its own guidance. The navy department, on an order of paving brick shipped to the Island of Guam, got an abrasion loss of less than 10 per cent and an absorption of a little over 1 per cent. The bricks exceeded their requirements by more than 100 per cent in every particular.

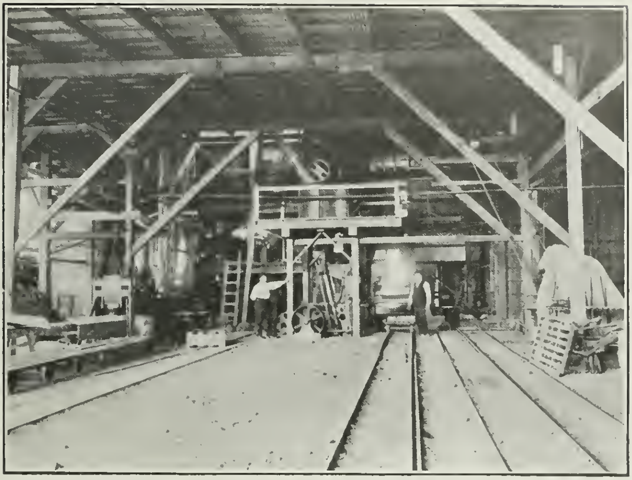
The engineers department of the city of San Francisco in a test of one of these bricks found they withstood a crushing strain of over 15,000 pounds to the square inch, or in other words, it took over 150,000 pounds to crush half a brick. The absorption on this brick was .13 of one per cent. Tests made by the city of Oakland also show that the bricks exceeded their requirements and they are now being laid in the streets while numbers of tests at the plant show abrasion losses from 10 to 17 per cent and absorption tests from .26 of one per cent to 3 per cent. In other words these bricks show tests equal to the Seattle Paving Brick and as good as the best product of the Eastern kilns.

The Market

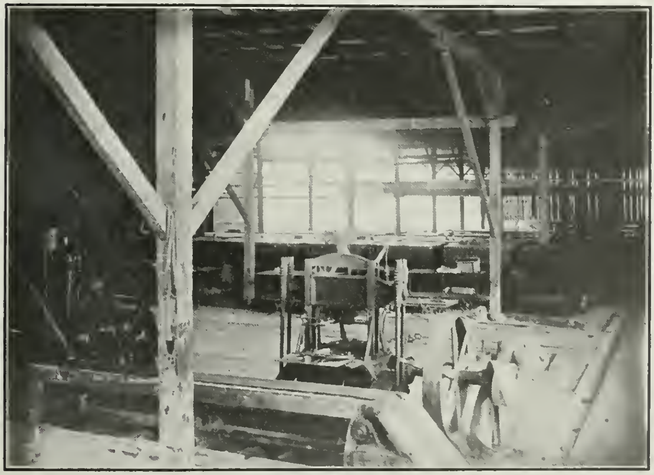
The market for a vitrified brick in Central California is almost unlimited and is as yet scarcely touched. The city of San Francisco will use 30,000,000 vitrified brick in the reconstruction of her sewer system and has already specified them for gutters, preliminary to paving the streets. The Oakland Traction Company is using bricks from this plant for runners along their street car tracks and will use nearly two million brick in that manner during the present year. The state of California has voted 18,000,000 dollars for the improvement of state highways and experience has demonstrated that nothing stands automobile traffic like a good vitrified brick. A country road with a run way of brick about 18 feet wide down the centre and a macadam street on either side makes an ideal traffic way for both slow and fast vehicles and is good both in winter and summer.

This plant also turns out a thoroughly vitrified building brick, having the unusual qualities of extreme toughness, an unequalled crushing strength with a surface as hard or even harder than glass and in the rare colorings of salmon and chocolate as well as the more common ones of red and black, giving the architect a wide and effective range of coloring for his color scheme.

In conclusion it cannot be too strongly stated that vitrified paving brick are a complete success and that they have



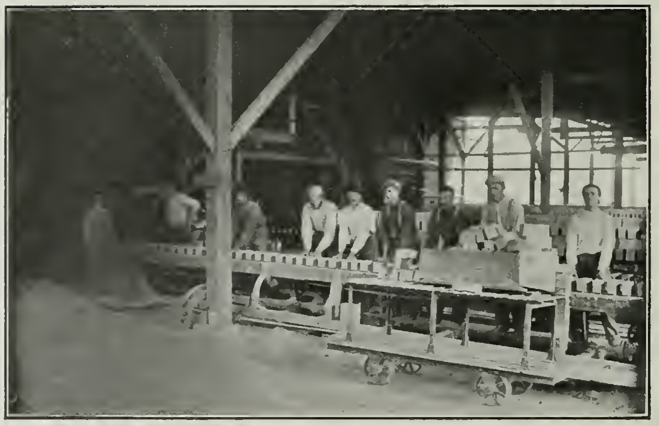
Brick Machine and Dry Press



Represser and Loader Can, Vallejo Plant

come to stay. That the largest field on the whole Pacific Coast is Central California and the people are to be congratulated on having a plant so near at home which is turning out a vitreous brick not excelled by any plant in the United States for street paving or sewer building.

Bee Hive Type of Kiln, Vallejo Brick & Tile Company



Preparing Brick for the Dryer

Finished Product Sorted and Piled in Yard Ready for Shipment

Loaded Car Ready for Dryer

In the Yards of the Vallejo Plant

Schooner Loading Brick for the San Francisco Market

Urges Beautification of City

San Franciscans must concentrate their efforts upon the beautifying of the downtown district of the city, declared Arthur F. Mathews, brother of Architect Edgar A. Mathews, in an address before the California club on "The City That Should Have Been."

"Every small district in San Francisco is squabbling over some little subject and refuses to give way to the great interest of the center of the city," he said. "San Francisco needs the advice of an expert architectural commission. The trouble is that people are always suspicious of men of skill and suspect them of seeking little beyond financial advantage."

N. W. Mohr, the former city architect, spoke also on "The City We Ought to Have." He advised the planting of trees and lawns, and urged the preservation of the trees already growing.

A Municipal Structural Engineer

The city council of Los Angeles has allowed the department of buildings a new member on its force, a structural engineer, whose salary has been fixed at $175 per month. This position comes under the civil service commission, to whom applicants should apply for information regarding the time of examination, etc. It is a new position and consequently there are now no eligibles in line for it. The council also raised the salary of the concrete engineer from $150 to $175 per month.

San Francisco Hardware Company

The San Francisco Hardware Company of 3069 Sixteenth street, San Francisco, has supplied the hardware on the following buildings designed by architects Crim & Scott, whose work is illustrated in this issue: Mission Savings bank, Byrne apartments, Stuttmeister apartments and the Tucker flats. Corbin hardware was used on each contract.

Did Plumbing Work for Crim & Scott.

Ahlbach & Mayer, plumbers, have done the plumbing on the following buildings designed by Architects Crim & Scott, whose work is illustrated in this number of the Architect and Engineer:

Residence for Grover Elam, Lake street, west of Twentieth avenue; twelve apartments for Davidson & Caldwell, east side of Taylor street, south of Jackson; three-story frame store and apartment building for Freeman & Nichols, Polk street, north of Vallejo; two-story and basement brick building, Kearny street, south of Post, and residence for L. A. Weber, on Thirty-fifth avenue, north of Point Lobos.

Mission Grammar School Building, San Francisco
Newton J. Tharp and L. P. Rixford, Architects

A Splendid Piece of Masonry Work

Many San Francisco architects have lately been segregating their contracts instead of letting them out to one firm. The results have been very satisfactory. Among the contractors who is getting his share of segregated work is T. F. O'Rourk, mason. Important contracts recently taken by him include the William Ede building on Market street, between Sixth and Seventh streets, San Francisco, designed by Architect William Knowles. This structure will have an attractive marble front. The walls will be of common brick.

Mr. O'Rourk has also contracted to do the masonry work on a church at Eighteenth and Dolores streets, San Francisco, from plans by Francis Reid of Berkeley; also the brick work on a $10,000 Class A theatorium on Mission street, between Twenty-first and Twenty-second streets, San Francisco, Henry Meyers, architect. All these contracts have been taken within the last six or eight weeks, and are in addition to many small jobs.

Mr. O'Rourk has recently completed building a continuous brick kiln for the Carqueniz Brick Company at Eckley. The furnace contains over 750,000 brick. O'Rourk's specialty is to "camp" on the job till it is done. He lets no grass grow beneath his feet.

The Mission grammar school, illustrated above, is an example of Mr. O'Rourk's brick work. This is one of the finest school buildings erected by the city of San Francisco since the fire, and the brick work is a feature of the structure. Carnegie's No. 4 light pressed brick and terra cotta are used exclusively in the facing, and it makes a most attractive facade. Mr. O'Rourk makes his headquarters at the Builders' Exchange. A postal card will reach him. No job is too big or none too small for him to figure.

Bad Rock and Concrete Rejected

The Bureau of Inspection of the Merchants' Association of San Francisco is doing splendid work in keeping tab on municipal construction work.

At the request of the Bureau the Board of Public Works has ordered a thorough examination of the defective concrete in the morgue building of the infirmary, with the result that it was decided that, based on the specifications for this work, the condition of the building warranted its condemnation; and the Board of Works has ordered all the concrete torn out and the work done over.

In addition to the above the inspectors' reports show three attempted breaches of specifications on one of the new school buildings. Rock for the concrete was very dirty, a large percentage of it was soft, and the concrete was being mixed by hand, making a lower value in the cement element, and a lower strength of the aggregate. Complaint was made by the bureau inspector, but the work went right on until the matter was carried up to the president of the Board of Works. In Mr. Casey's office pieces of the rock delivered for this job were taken by the bureau's engineer and knocked to pieces in the hand. A thorough investigation of the whole building has been requested, to include tests of the completed concrete. Samples of this rock have been taken before witnesses and stored under seal in the office of the bureau.

Models of Panic Bolt

Russell & Erwin call attention in their page advertisement this month to their panic bolt for theater and school doors. Models of the bolt and door have just been received from the Eastern factory and may be seen in operation at the San Francisco salesrooms of the Russell & Erwin Company.

Combined Business and Pleasure.

Mr. H. L. Balch, secretary and treasurer of the Reliance Ball Bearing Door Hanger Company of New York, with agencies in San Francisco, Los Angeles, Portland and Seattle, recently completed a very successful business trip through the Southern states. At New Orleans Mr. Balch, who is an enthusiastic Shriner, took in the big meeting there and combined business with pleasure. Postal cards mailed to some of his friends on the coast tell the story of his travels better than words might describe. Mr. Balch was much impressed with the city of Atlanta where he established an agency for his popular ball-bearing door hanger. This hanger, by the way, is built on a scientific principle and will stand the most rigid tests. It is in use in almost every large building erected in New York City within the past two or three years and reports stamp them as giving perfect satisfaction.

As a result of Mr. Balch's trip, an interesting comparison is afforded between the south and the coast. While on the coast, Mr. Balch was cordially received and was so impressed by the remarkable energy and enthusiasm of the people, that he carried away a very pleasant and lasting impression of them and their method of doing things; and while he was by no means disappointed in realizing the time-honored and far-sung traditions of southern hospitality, he returned from his southern trip with a greater realization of the contrast and the methods, customs and people of the different sections of the country.

On the coast everybody seemed to be full of vim and hustle, looking upon gigantic tasks to be accomplished as nothing more than ordinary labor to be encountered in a day's work. Enthusiasm and a co-operative spirit seemed to carry everybody on the top wave of accomplishment and success. And above all, Mr. Balch noted that the people, in spite of their energy and driving spirit, seemed to find, or at least to take, plenty of time to enjoy the finer things of life. In the south, while very cordially and courteously received, Mr. Balch found a tendency to take things easy: the people take more time to enjoy themselves than they do in the north. But the south is growing rapidly and much has been accomplished in artistic and thorough building.

Since Mr. Balch was on the coast, his company has received many orders for "Reliance" hangers, as practically all of the most prominent buildings that have been built in the three coast states during the past year, have been equipped with their hangers.

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The Reliance Ball Bearing Door Hanger Company is represented in San Francisco by the Sartorius Company; in Portland by the Portland Wire & Iron Works; in Seattle by D. E. Fryer & Company; and in Los Angeles by Louis R. Bedell. At the offices of these concerns models of the "Reliance" hangers can be seen at any time and any information that is desired concerning them can be obtained.

Health Department Endorses Garbage Chute

The Sanitation Committee of the San Francisco Board of Health has thoroughly investigated the Bradshaw garbage chute and has found it fully up to the requirements of the sanitary regulations of the city. The committee, in fact, is so well pleased with the device that it has recommended its use to the Board of Health. The latter body has accepted the committee's report in full and ordered the same placed on file.

The following letter from Health Officer McNutt explains itself:

Mr. E. L. Williamson,

3552 Eighteenth St., San Francisco.

Sir:—Referring to the matter of the Bradshaw Patent Garbage Chute, permit me to state that the matter was brought before the Board of Health on a report of the Sanitation Committee of said board, and while said committee was of the opinion that this type of garbage chute was a sanitary device and without doubt practical in its operation, the Board of Health, following a long established precedent, decided that it could not go on record as endorsing any patent sanitary device when such endorsement would be used for commercial purposes.

Respectfully,

W. F. McNUTT, Jr.,
Health Officer.

The Bradshaw garbage chute extends from basement to roof. and is thoroughly ventilated. It is connected at each floor with hot or cold water, which cleanses all garbage, dissolves all ashes, which form a lye, and cuts all grease going into sewer, making the garbage sanitary when removed to the street.

From an economical as well as a sanitary standpoint, there will be less garbage to be disposed of than with the present old system, and as it percolates through the garbage not only thoroughly cleanses, but packs down, thereby displacing about one-third the space it would if in a dry state. The chute sits over a cast iron cesspool, which in turn is connected with trap and clean-out plug, ready for connecting with sewer.

The chute is installed complete with three coats of paint inside, ready to connect with water and sewer, and is guaranteed for a period of one year. The chute is manufactured in enameled tile, vitrified pipe, obscure glass and galvanized iron. A full-size model is now in operation at 77 Sutter street for demonstrative purposes, and architects and builders are cordially invited to call and inspect the chute in operation.

Rex Flintkote Roofing

W. P. Fuller & Co., who for a number of years have had the Pacific Coast agency for Rex Flintkote roofing and other roofing specialties manufactured by J. A. & W. Bird & Co., of Boston, Mass., now have in stock at their ten branches an improved canvas top roofing, which is manufactured under the trade name of "Special Paradux Canvas Top Roofing."

They have in the past few years been furnishing Paradux Canvas Roofing, which has met with great favor among the architects and engineers.

The new Special Paradux Canvas Top Roofing is different from the line they have been carrying, inasmuch as it is 60 inches wide, instead of 36 inches, and it is composed of a heavier piece of cotton duck backed up on the under side with a heavy coating of waterproof compound, which serves as a perfect waterproofer as well as a cushion that saves the wear upon the canvas.

Because of the extra wide sheets this comes in, it necessitates very few seams on the ordinary veranda or porch roof.

The cost of treating this canvas after it is put in place is less than the cost of oiling and painting an ordinary canvas roof, and the material costs little or no more than heavy duck.

This material can, when ordered especially, be furnished in widths up to 120 inches, which will cover the ordinary 10-foot veranda roof without a seam.

This roofing is meeting with great favor the country over among the architects and engineers, and bids fair to be a popular roof covering for many purposes and will to a large degree, displace the old style canvas roofing.

W. P. Fuller & Co. have met with unusual success in their roofing departments in all of their branches, which is undoubtedly due to the fact that they carry one of the highest grade lines of roofing and waterproofing materials manufactured.

Most Diversified Stock of Hardwoods in the United States.

THE stock of hardwood lumber carried by White Brothers, the pioneer hardwood lumber merchants of Spear and Howard streets, San Francisco, besides being the largest general stock west of Chicago, is the most diversified in the United States. This appears to be a very broad statement, especially as we on the Pacific Coast are so far away from the native habitat of the hardwoods. The reason, however, is based on the very fact that we are such a long distance from where oak, ash, hickory, maple, etc., grow. The Eastern, Southern and Middle Western yards specialize as a rule on the woods of their particular section.

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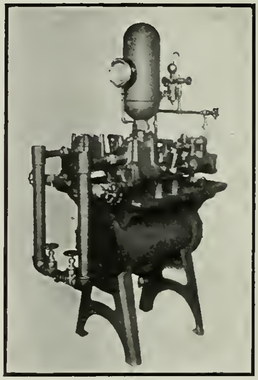

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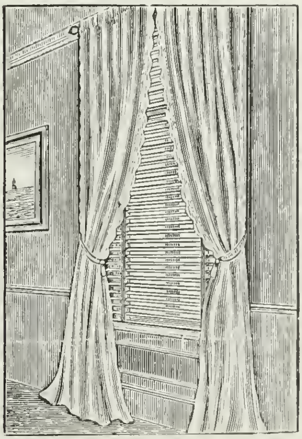
One yard will carry oak and ash, another gum, another cottonwood, another maple and birch, etc. There the customer is near the source of supplies and a day or so is all that is necessary for a consumer or retail dealer to have his order of hardwood filled. On this Coast, however, a month is as short a time as can be figured on to get a carload from the East and a less than carload lot is out of the question on account of the freight rate. To take care of this situation White Brothers always have on hand three million feet or more of hardwoods. This includes every kind of hardwood used in wagon making, ship building, interior finish, cabinet making, and in fact every branch of wood-using industry.

The Modern Venetian Blind

Among the elements adding to the comfort and convenience of a home, office or shop not the least is the system provided for the regulation of the amount of light which shall be permitted to enter.

It seems odd, when one pauses to give the matter consideration, that through



all the ages there have been only four methods devised for the regulation of daylight; the outside shutter, the roller shade, the hanging curtain and the Venetian blind.

Of these four methods at least one, the outside shutter or blind, is practically obsolete, and deservedly so. Not only is the shutter a disfigurement to the outside of a building, but it is cumbersome and impracticable.

With the vagaries of the roller shade we are all familiar, and the writer hesitates to awaken painful memories, in the reader, of broken springs, torn fringes and faded body grounds, with which he has made acquaintance in the distant, but still vividly remembered past. As for the hanging curtain, it belongs in very much the same class as the last.

From the foregoing it is apparent that the most convenient, sanitary and generally satisfactory mode of window shading is the Venetian blind.

Of the many makes of Venetian blinds on the market, the Ericsson Venetian blind, made in Gothenburg, Sweden, and imported by the Swedish Venetian Blind Company, is perhaps the best.

As the result of sixty years' experience, during which the highest award has been taken at all exhibitions, this company has evolved a Venetian blind of unusual excellence.

Among the various excellencies of the Ericsson blind is to be numbered a device giving four degrees of shade in the full or any portion of the blind, slats of thin and light material, but possessed of great strength, one combined pulley head and turning-lath resting in iron hooks, cords run in glass hoops which prevent them from catching, or wearing out, and a simple arrangement permitting the blinds to be taken down, like a roller shade, for the purpose of being cleaned.

Further details about the Ericsson blind, descriptive literature and all information will be cheerfully furnished by the Pacific Coast agents, Messrs. Williams & Carter, 197 Jessie street, San Francisco.

Engaged in Doing Good.

One of the busiest of San Francisco's plumbers is Mr. J. Looney, whose office and shop are on City Hall avenue.

Mr. Looney has been engaged in the plumbing business for eighteen years, and the quality of his work is such that it has become a proverb among San Francisco architects, that "whatever Looney does, he does right."

Crim and Scott, architects, have given Mr. Looney the contract for the plumbing of a number of the buildings recently designed by them, and built under their supervision, including the Marathon apartments, and the Cumming apartments, both of which buildings are shown in this issue of the Architect and Engineer.

The Butler flats and the new garage, at Golden Gate and Van Ness avenues are among the recent jobs done for these architects.

Mr. Looney has done considerable work on public buildings, in the past two years, including the Children's Hospital, the Youth's Directory, in San Francisco, and the Providence Hospital, in Oakland.

When it is considered that upon the plumber, more than upon any other of the contractors who take part in the construction of a building, rests the responsibility for the health—the life—of the occupants, it is apparent that the plumber who does his work "better than well" is a more serviceable member of society than the physician who wrestles with disease.

Ornamental Plaster Mantels

C. Menzer & Son, the San Francisco architectural modelers and sculptors, have been doing some splendid work for Architect Frederick H. Meyer, most important of which are the ornamental plaster mantels in the Heuter apartment house at Bush and Jones streets, and also the mantels in Mr. Meyer's new residence in San Francisco. Menzer & Son are also executing the mantel work for the new Concordia club building, Lansburgh & Joseph, architects.

THE ARCHITECT AND ENGINEER of California and Pacific Coast States

JUNE 1910

FEATURES

The Conduct of Architectural Competitions

Santa Rosa's New Federal Building

A Pipe Organ of Reinforced Concrete

The California Bungalow

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Contents for June

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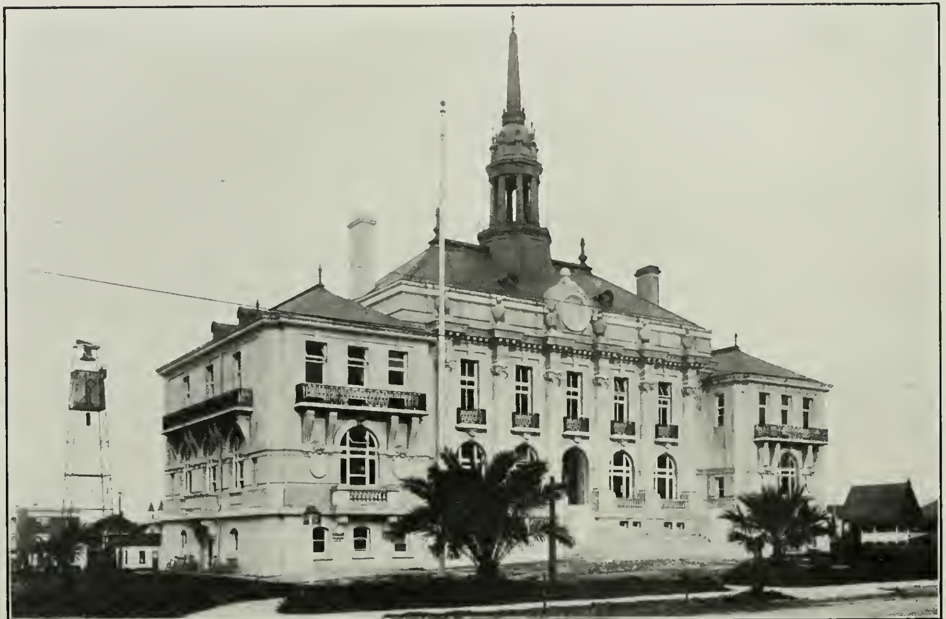


Frontispiece
The Architect and Engineer of California
June, 1910

REINFORCED CONCRETE CITY HALL, BERKELEY
Bakewell & Brown, Architects

THE

Architect and Engineer

Of California

Pacific Coast States

VOL. XXI. JUNE, 1910. No. 2.

Good Building Construction

By FRED J. RICKON, C. E.*

REINFORCED concrete in experienced hands is a safe and highly satisfactory building material. Improperly handled, the same class of construction is dangerous, but no more so than steel or brick. We hear of failures in all classes of building, due invariably to incompetent supervision, but more publicity is given concrete troubles because it is only in the last few years that this type of construction has become general. We find that the enemies of concrete are invariably responsible for the distorted accounts of alleged reinforced concrete failures. However, I do not believe in shielding poor construction, even though it may hurt the industry. The proper kind of publicity should and will act as a check and a preventative of bad work, be it concrete, brick or steel.

The Pacific Coast seems to be especially fortunate in having experienced men to design and superintend its great buildings. The contractors, too, are, as a whole, men of experience and reliability and the result is we have had few, if any, failures.

Although the practical advantages of reinforced concrete were demonstrated long before theoretical analysis of its properties was 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, civil engineer or builder 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, engineer or contractor 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 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 out-

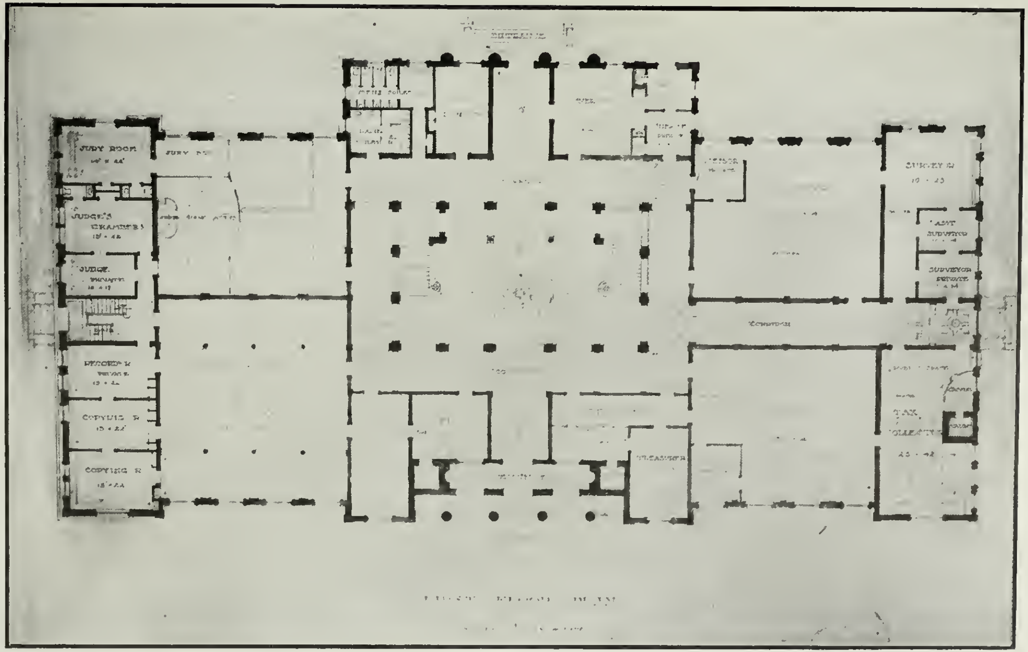
*Col. Rickon is a member of the Rickon-Ehrhart Engineering & Construction Company of San Francisco and the illustrations accompanying this article are of buildings this company has erected.

Farmers and Merchants Bank Building, Oakland, Cal.
Sutton & Weeks, Architects

Interior Farmers and Merchants Bank Building, Oakland, Cal.
Sutton & Weeks, Architects

State Home for the Blind, of Reinforced Concrete, Oakland, Cal.
Nat C. Ellery, State Engineer

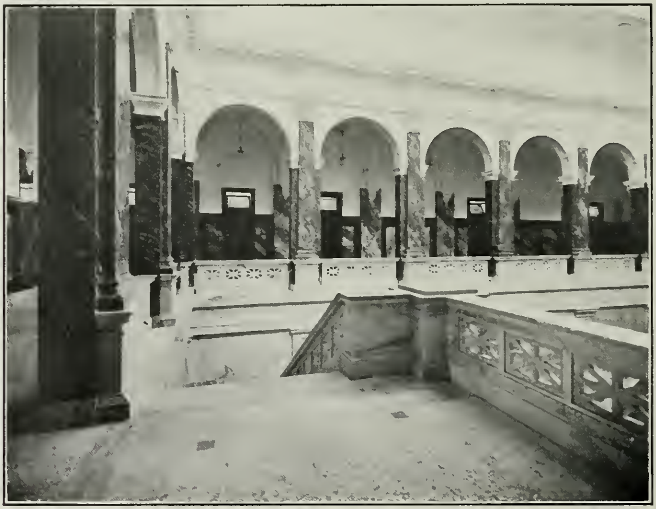
Perspective Santa Rosa Court House, Santa Rosa, Cal. *J. W. Dolliver, Architect*



Floor Plan, Santa Rosa Court House

Photograph of Santa Rosa Court House, Taken in May
J. W. Dolliver, Architect

come, the work must be subjected to a rigid inspection at all times, and the contractor is 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.



Second Floor Corridor, Santa Rosa Court House

Rotunda and Staircase, Santa Rosa Court House
J. W. Dolliver, Architect

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.

Fire House of Reinforced Concrete, Oakland, Cal.
Fred Sodeberg, Architect

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 Conduct of Architectural Competitions

THE following circular of advice has been issued by the American Institute of Architects relative to the conduct of competitions, the regulations therein adopted having gone into effect on March 30th.

Competitions are instituted with the sole purpose of advancing the interests of the owner. The American Institute of Architects believes that those interests are best served by fair and equitable agreements between owners and competitors and it issues this circular as a statement of the principles which should underlie such agreements.

1. On Competitions in General.

A competition, when properly conducted, is a means for the selection of an architect. As an incident, a good preliminary scheme may sometimes be obtained, but the Institute is of the opinion that competitions are in the main of no advantage to the owner. It therefore recommends that, except in cases in which competition is unavoidable, an architect be employed upon the sole basis of his fitness for the work.

2. On the Employment of a Professional Adviser.

No competition should be instituted without the aid of a competent adviser. He should be an architect of the highest standing and his selection should be the owner's first step. He should be chosen with the greatest care, as the success of the competition will depend largely upon his experience and ability. His duties are to advise those who hold the competition as to its form and terms, to draw up the program and to conduct the competition.

Competitions are at best a slow and expensive method of choosing an architect; and it is unwise to attempt to save either time or money by not having an expert adviser.

3. On the Qualifications of Competitors.

It is prejudicial to the interests of the owner that an architect should be admitted as a competitor who cannot in advance establish his competence to design and execute the work.

It is sometimes urged that by admitting all who wish to take part some unknown but brilliant designer may be found. If the object of a competition were a set of sketches, such reasoning might be valid. But sketches give no evidence that their author has the matured artistic ability to fulfill their promise, or that he has the technical knowledge necessary to control the design of the highly complex structure and equipment of a modern building, or that he has executive ability for large affairs or the force to compel the proper execution of contracts. The attempt to defend the owner's interests by associating an architect of ability with one lacking in experience has proven futile.

4. On the Forms of Competition.

The following forms of competition are recognized:

(a) Limited: In this form participation is limited to a certain number of architects of ample qualification whose names are stated in the program and to any one of whom the owner is willing to entrust the work. This form is generally employed by conservative owners having large interests at stake. It has the advantage that the owner and the professional adviser may meet the competitors and fully discuss the terms of the competition with them before the final issuance of the program.

The Institute is of the opinion that, unless cogent reasons prevent it, competitions should be of the limited form.

(b) Open: This form has sometimes to be employed on account of legislative enactment. It consists in permitting all architects—or all within certain limits—without regard to their qualifications, to take part.

(c) Open to Approved Applicants: In this form all architects who desire to compete make application accompanied by evidences of their professional capabilities. The owner, with the assistance of his professional adviser, determines which of such applicants he deems capable of properly executing his work and issues invitations to all or a limited number of them. This is obviously a much better form than the open competition, for if the standard be kept high, none but men of experience and ability will be admitted. Like the open competition, however, it fails to insure the participation of architects of the highest standing.

(d) Mixed: In this form a limited competition is conducted simultaneously with one open to approved applicants, the program being uniform for all. This form has the advantage of insuring the participation of architects of known ability.

(e) Double: This form begins with a preliminary competition of any of the above forms. From the participants therein are chosen a small number to take part in a second competition involving more highly elaborated drawings. A variant of this form involves the selection, by means of a preliminary competition open to approved applicants, of certain architects who participate in the second competition with others especially invited. In this form the program of each competition should be issued to all simultaneously.

The Institute fails to see that the results of double competitions have in any way justified the length of time consumed by them or the trouble and expense imposed on all concerned.

5. On Anonymity of Competitors.

Absolute and effective anonymity is a necessary condition of a fair and unbiased competition. The signing of drawings should not be permitted nor should they bear any motto, device or distinguishing mark. Drawings and the accompanying sealed envelopes containing their author's names should be numbered upon receipt, the envelopes remaining unopened until after the award.

6. On the Cost of the Proposed Work.

No statement of the intended cost of the work should be made unless it has been ascertained that the work as described in the program can be properly executed within the sum named. In general it is wiser to limit the cubic contents of the building than to state a limit of cost.

The program should neither require nor permit competitors to furnish their own or builders' estimates of the cost of executing the work in accordance with their designs. Such estimates are singularly unreliable. If the cubage be properly limited they are unnecessary, but if required, they should be made for all designs by one unprejudiced person employed by the owner.

7. On the Jury of Award.

To insure a wise and just award and to protect the interests of both the owner and the competitors, the competitive drawings should be submitted to the judgment of a jury so chosen as to secure expert knowledge and freedom from personal bias. For work of great importance the jury should consist of at least five members; for work of less importance three may suffice. The jury should be composed of architects, some of whom may be chosen by the competitors, and, when necessary, an expert on the special problem involved.

It is the duty of the jury to study carefully the program and all conditions relating to the problem and the competition before examining the designs submitted; to place out of competition any design that does not fulfill the conditions distinctly stated as mandatory in the program; to give ample time to the careful study of the designs; and to render a decision only after mature consideration. Unless there be strong reasons against it, the award of the jury should be binding on the competitors and the owner.

8. On the Competitive Drawings.

The purpose of an architectural competition is not to secure fully developed plans, but such evidence of skill in treating the essential elements of the problem as will assist in the selection of an architect. The drawings should, therefore, be as few in number and as simple in character as will express the general design of the building. Elaborate drawings are not necessary for a jury of experts whose judgment is rendered upon fundamental principles of design. Lengthy programs and detailed instructions as to the desired accommodations should be avoided, as they confuse the problem and hamper the competitors.

9. On the Program.

The program should contain rules for the conduct of the competition, instructions for competitors and the jury, and the agreements between the owner and the competitors. Uniform conditions for all competitors are fundamental to the proper conduct of competitions.

Care should be taken that no provision of the program be in violation of any Municipal, State or Federal law and especially of any law under which the competition may be instituted.

A distinction should be clearly drawn between the mandatory and the advisory provisions of the program, that is to say, between those provisions which if not met preclude an award in favor of the author of a design so failing, and those which are merely optional or of a suggestive character.

It is difficult to summarize briefly the program, but it should at least:

(a) Name the owner of the structure forming the subject of the competition, and state whether the owner institutes the competition personally or through representatives. If the latter, name the representatives, state how their authority is derived and define its scope.

(b) State the kind of competition to be instituted, and in limited competitions name the competitor; or in open competitions, if the competition is limited geographically or otherwise, state the limits.

(c) Fix a time and place for the receipt of the designs. The time should not be altered except with the unanimous consent of the competitors.

(d) Furnish exact information as to the site.

(e) State the desired accommodation, avoiding detail.

(f) State the cost if it be fixed or, better, limit the cubic contents.

(g) Fix uniform requirements for the drawings, giving the number, the scale or scales, and the method of rendering.

(h) Forbid the submission of more than one design by any one competitor.

(i) Provide a method for insuring anonymity of submission.

(j) Name the members of the jury or provide for their selection. Define their powers and duties. If for legal reasons and in whom such power is vested.

(k) Provide for placing out of competition any drawing or set of drawings that has violated a mandatory provision of the program.

(l) Provide that during the competition there shall be no communication, except in writing, between any competitor and the owner or the professional adviser or a member of the jury, and that any information, whether in answer to such communication or not, shall be given in writing simultaneously to all competitors. Set a date after which no questions will be answered.

(m) State the number and amount of payments or prizes for competitors.

(n) If possible name a date before which the final decision will be rendered.

(o) Provide for informing each competitor of the result of the competition.

(p) When possible provide for a public exhibition of the drawings. Provide that no drawings shall be exhibited or made public until after the award of the jury and not then without the consent of the author.

(q) Provide for the return of unsuccessful drawings to their respective authors within a reasonable time.

(r) Provide that nothing original in any of the unsuccessful designs shall be used without consent of and compensation to the author of the design in which it appears.

(s) Include the contract between the owner and the competitors.

(t) Include the contract between the owner and the architect receiving the award.

10. On the Agreement.

The program should constitute a definite and binding contract between the owner and competitors, guaranteeing that an award of the commission to design and supervise the construction of the work will be made in favor of one of the competitors.

Payments to or prizes for unsuccessful competitors should be provided as follows:

(a) In limited competitions, to each competitor a payment to cover the cost of the preparation of the drawings demanded.

(b) In open competitions of either sort, substantial prizes for a certain number of competitors adjudged to have produced the best work.

(c) In mixed or double competitions the several classes should be paid as above indicated.

The lack of a contract which becomes self-operative between the owner and the winner immediately upon the making of the award leaves their relations at a critical moment in an intolerable condition. Therefore the program should, except in cases where such a course is not permitted by law, constitute a contract between the owner and the competitor to whom the commission is awarded, employing him to design and supervise the construction of the building. It should provide for procedure in accordance with and for payment at rates not lower than those named in the "Professional Practice of Architects and Schedule of Proper Minimum Charges" of the American Institute of Architects.

The contract should further provide that, immediately upon the making of the award, there shall be payable by the owner to the winner a sum equal to one-half of one per cent of the estimated cost of the work for which the competition has been held, such payment upon the progress of the work merging in the total fee. Provision should also be made that should the owner for any reason wish to sever his relation with the winner, he may do so by paying him an additional sum equal to three-quarters of one per cent (one and one-quarter per cent in all) in lieu of carrying out the agreement to employ him as architect. Provision should further be made that if the owner fail, within twelve months of the award, to give the winner instructions to proceed with working drawings, or if at any time before the working drawings are started the intended work be abandoned, there shall fall due to the winner three-quarters of one per cent (one and one-quarter per cent in all) in lieu of carrying out the agreement to employ him as architect.

11. On the Conduct of Architects.

No architect shall submit in competition a design which has not been produced in his own office or under his own direction.

The Canons of Ethics of the American Institute of Architects declare that it is unprofessional conduct for an architect:

1. To take part in any competition the terms of which are not in harmony with the principles approved by the Institute.
2. To attempt in any way, except as a duly authorized competitor, to secure work for which a competition is in progress.
3. To attempt to influence, either directly or indirectly, the award in a competition in which he is a competitor.

4. To accept the commission to do the work for which a competition has been instituted if he has acted in an advisory capacity, either in drawing the program or making the award.

12. ON THE CONDUCT OF THE OWNER.

In order to maintain absolute impartiality toward all competitors, the owner, his representatives and all connected with the enterprise, should, as soon as a competition is determined upon, refrain from holding any communication in regard to it with any architect except the professional adviser. The meeting with competitors described in Article 4, Section A, is of course an exception.

13. ON THE POSITION OF THE AMERICAN INSTITUTE OF ARCHITECTS.

The Institute does not presume to dictate the owner's course in conducting competitions, but aims to assist him by advising the adoption of such methods as experience has proved just and wise. The Institute, however, entertains such definite convictions upon the subject of competitions that its convention held in Washington, D. C., December 14, 15 and 16, 1909, authorized the Board of Directors to issue this circular and to inform members that the following resolutions approved by that convention are in effect.

Resolved: That it is unprofessional conduct for any member of the American Institute of Architects to take part as a competitor or juror in any competition unless its program shall have received the formal approval of the Institute if the competition be open to members of more than one Chapter, or of the Chapter if the competition be open to members of only one Chapter; and that the Board of Directors be and it hereby is authorized to give such approval in the name of the Institute and to delegate this authority.

Members are, therefore, informed that the above resolution will be in force on and after the 30th day of March, 1910, and that the Board has delegated its authority to give the formal approval of the Institute on competition programs to the standing committee on competitions and to a sub-committee on competitions in each Chapter of the Institute, of which sub-committee the President of the Chapter shall be the Chairman.

14. ON THE DUTIES OF THE STANDING COMMITTE ON COMPETITIONS AND OF SUB-COMMITTEES ON COMPETITIONS.

As competition practice must of necessity vary for different occasions and in different parts of the United States, considerable latitude of interpretation is given to the standing committee on competitions and to sub-committees on competitions which, however, should withhold the approval of the Institute unless in the main the program conforms to the spirit of this circular.

The following instructions are, however, mandatory: The approval of the Institute must be withheld from a competition

(a) If it appear that the program is not in consonance with the law;

(b) Unless the program excludes from the competition all persons who cannot in advance establish to the satisfaction of the owner their competence to design and execute the work;

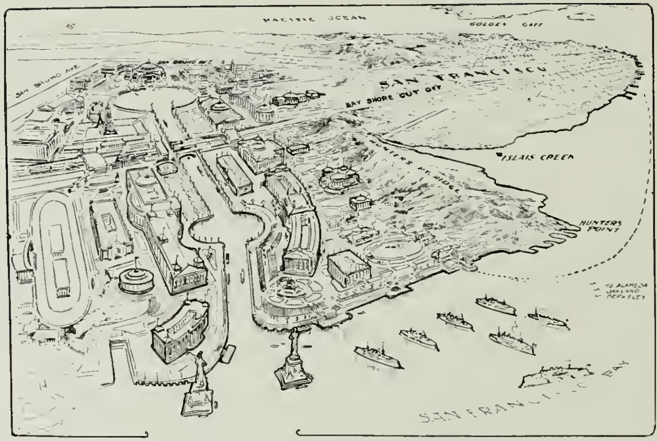
(c) Unless the program provides for a professional adviser as called for in Article 2, or for a competent jury as called for in Article 7, or for both;

(d) Unless the program constitutes definite contracts explicitly covering all the points set forth in Article 10.

Exceptions to Articles (b), (c) and (d) may be made only when and in so far as their provisions are contrary to law.

Competitions held by the Treasury Department of the United States under the Tarsney Act and International competitions do not require the approval of the Institute.

An appeal from the decision of any sub-committee may be made to the standing committee on competitions of The American Institute of Architects and thence to the board of directors.



Birdseye View of Proposed Site for the Panama-Pacific Exposition, San Francisco

Proposed Site for the Panama-Pacific Exposition

NOW that San Francisco bids fair to have the Panama-Pacific Exposition in 1915 the different promotion clubs and realty organizations are expected to work overtime in the preparation of attractive press matter and picturesque designs in the interests of their respective sites. One of the first organizations to come to the front is the Bay View Development Club, whose representative, James K. Taylor, offers the following:

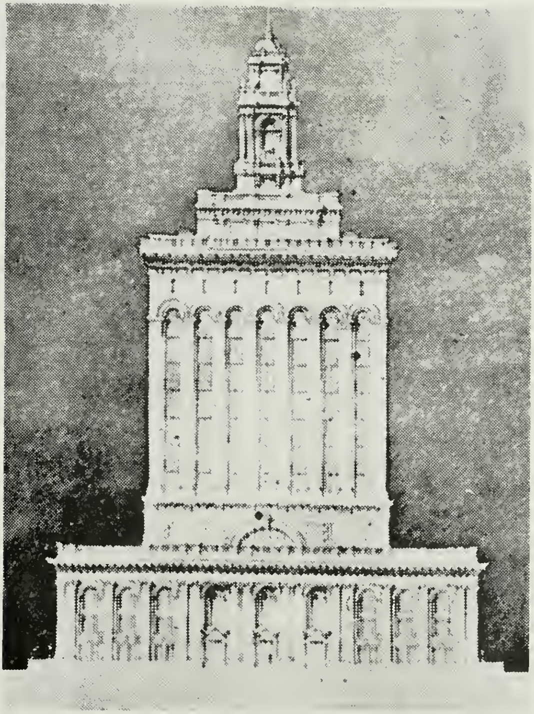
In the matter of natural adaptability, Bay View stands pre-eminent among the sites proposed for the Panama-Pacific Exposition—the place par excellence for the convocation of the myriads of visitors who are to join with us in the celebration of the greatest event in the history of the development of the maritime commerce of the world.

The placid bay of San Francisco, the one great safe harbor of the Pacific, known to the deep-water sailormen of all the seas, will be the destination of a mighty fleet of merchantmen, flying the flags of all the nations of the earth, freighted with the best product of the advanced thought of the progressive peoples of two continents.

The broad expanse of water at Bay View affords an entry-way for freights and passengers by sea to the ten thousand acres of gently sloping mesa, snuggled by the ranges of hills extending westerly to Mission street.

The all-rail routes to the exposition selected by Pacific Coast and transcontinental visitors have their terminals in the cut-off which traverses the Bay View site. By land or sea visitors may purchase transportation from the place of departure direct to Bay View.

Freights by water and rail need be handled but once, being landed within the boundaries of the site and deposited at points selected for permanent exposition.



Successful Design for Municipal Building, Oakland, Cal.
Palmer & Hornbostel, Architects

Result of Oakland City Hall Competition

ARCHITECTS Palmer and Hornbostel of New York City have been selected by competition to prepare the plans for Oakland's $1,000,000 municipal building. This firm will receive a prize of $5,000 in addition to the regular six per cent commission for designing and superintending the construction of the building.

The honorary prize offered by the city was awarded to Cass Gilbert of New York, while the 10 second prizes of $1,000 each were won by the following contestants:

Bakewell & Brown, 417 Montgomery street, San Francisco.
A. W. Brunner, 33 Union Square West, New York.

Delano & Aldrich, 4 East Thirty-ninth street, New York.
J. H. Freedlander, 244 Fifth avenue, New York.
G. W. Kelham, Crocker building, San Francisco.
H. Van Buren Magonigle, 7 W. Thirty-eighth street, New York.
Meyer & Reed, Humboldt Bank building, San Francisco.
Rankin, Kellogg & Crane, 1021 Walnut street, Philadelphia.
Ward & Blohme, Alaska Commercial building, San Francisco.
York & Sawyer, 156 Fifth avenue, New York.

The Hors de Concours went to Bliss & Faville, Balboa building, San Francisco, and Tracy, Swartout & Litchfield, 244 Fifth avenue, New York.

The competition was conducted strictly according to the rules of the American Institute of Architects and was limited to twenty-one invited architects from various parts of the country.

The plans call for a building 318 feet in height from the base to the top of the flagstaff which will surmount the cupola.

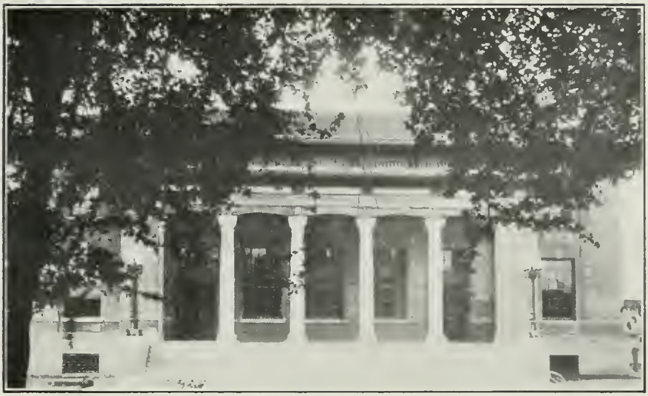
The structure will be of granite and steel. There will be four great divisions of the building, each of the main municipal departments being on separate floors. The building will be ten stories high. On the first floor will be the offices of the police and fire department, which will also occupy the major portion of the second floor. The next three stories are assigned to the offices of the assessor, the tax collector and the auditor, in the order named, while the remainder of the city offices will be arranged above. The city prison will be established in the three top floors, where provision has been made for cells, exercise courts and other modern jail facilities.

In their plans the successful architects have endeavored to combine two distinct types of buildings, a monumental structure for the accommodation of the mayor's office, the council chamber, the city clerk's office and the board of public works, with ample space for all purposes, and an office building for the accommodation of the other city departments which require a large clerical force, with an abundance of light and working space. Their design is practically that of a low monumental city hall, surmounted by a modern office building.

The police and fire departments have separate entrances from the street and have no interior connection with the city hall proper. The fire department is in the rear of the ground floor, with alley exits leading into both of the adjoining streets, which will permit the apparatus to be driven instead of backed into its place when returning from trips.

A mammoth vestibule of attractive design opens the way to a monumental stairway which leads to a large central rotunda some 65 feet above the level of the street. About this rotunda the most important of the municipal offices are grouped. An elaborate system of elevators will accommodate the traffic from floor to floor, while there will be two special elevators for communication between the city prison and the police courts. In these the prisoners will be carried.

One of the most ornate features of the interior scheme will be the council chamber, which is surrounded with galleries for the public, reached by stairways leading directly from the rotunda.



Post Office Building, Santa Rosa, Cal.
James Knox Taylor, Supervising Architect, Treas..ry Department.

The Santa Rosa Post-Office Building

By WILLIAM A. NEWMAN, Architect.

DURING a recent inspection of the new United States post-office building at Santa Rosa, now nearly completed, my attention was drawn to the admirable manner in which this little structure fulfills its mission in a practical, economical and utilitarian way, and at the same time is so pleasing and full of charm.

I deem the consistent, intelligent study of such models, worth while, with a view to analyzing their sources of harmony, proportion, and beauty, which cannot fail to be profitable to the architectural designer, stimulating the mind to the perception of those simple, yet subtle laws that distinguish minute differences, in the same way the hearing of good music educates the ear.

The design of the Santa Rosa federal building leans toward the Spanish renaissance, and is in harmony with its name. The building is two stories in height, with a frontage of 82 feet on Fifth street, extending back 52 feet, and is of the Class "C" type, having a limestone base to the watertable, surmounted by brick walls finished in stippled plaster.

Across the entrance front is a portico 51 feet by 13 feet, with an interesting colonnade of Bedford stone. The roof is simple and pleasing, finished with terra cotta tile.

As shown by the photographs the public corridors and lobby have been treated very appropriately with ornamental plastered ceilings, dark oak wood finish, and marble paneled terrazzo floors.

The cost, when completed, including all approach work, will be approximately $60,000, or about 31 cents per cubic foot.

The building was constructed under contract with Hoyt Bros. of Santa Rosa, and has been very favorably compared with other recent public buildings throughout the state.

Post Office Building, Santa Rosa, Cal.
James Knox Taylor, Supervising Architect, Treasury Department.

Post Office Building, Santa Rosa, Cal.—Detail of Colonnade
James Knox Taylor, Supervising Architect, Treasury Department

Post Office Building, Santa Rosa—Main Corridor
James Knox Taylor, Supervising Architect, Treasury Department.

Post Office Building, Santa Rosa—Main Corridor
James Knox Toylor, Supervising Architect, Treasury Department.

Concrete's Conquest—A Retrospect

By FRANK SOULE, C. E., University of California.

THE development, at first gradual, and afterwards rapid, of the multitudinous uses of concrete in construction is an excellent illustration of the law of evolution, or organized progression of the science and art of engineering. Its story shows plainly how every material for constructive use is seized upon and adapted in application so soon as its superiority is proved by test and experience. The ancient Romans used liberally of Roman cement and pozzuolana in their masonry, but chiefly for uniting the massive units in their stone work. As concrete, in our sense of the word, it was seldom, if ever, used by them.

In modern times, the French engineers took the lead in utilizing béton (concrete); but less than one hundred years ago, their applications of it were limited to the material in large masses, as, for example, foundations in the earth, sea-walls, and the like; and to situations where only statical forces of compression were to operate. Authorities were doubtful as to the strength and endurance of concrete as compared with those of natural stones, and particularly so when the material was to be subjected to shock, vibrations or transverse stresses. But their ideas and conceptions of the capabilities of concrete grew continually, and their applications of it to construction increased in number and variety. They recognized and appreciated rapidly, as time went on, the wonderful facility of its use in many forms; the great economy involved in the simple processes of gathering raw materials, cement, sand and stone in crude condition, which needed only proper wetting, mixing and shaping in cheap and elementary moulds, followed by final setting, drying and hardening, that would produce the relatively inexpensive and enduring blocks desired.

The art of cement making was greatly developed until the character and behavior of every standard brand came to be as surely predicted as that of steel and iron. The process of wetting and mixing the mass was perfected and the resistances that would be offered by the blocks became well known beforehand.

From the uses of concrete simply in walls, foundations and columns, its applications were extended to arches, piers and highway bridges of short span, where loads were not to be too heavy and vibrations would be moderate.

In our own country at this time, the service of concrete had not, as yet, become generally demanded.

Timber of the best quality was plentiful, cheap and easily wrought, and natural stone or brick was readily obtained. In fact, the "school of design" for concrete construction had not been opened as yet. The material and the best methods of making and using it had not been generally investigated by American engineers, so that for a considerable period of time its employment in construction was limited to river, harbor and sea-coast work, under the charge of officers of the United States corps of engineers.

But our American engineering school of practitioners is wonderfully open-minded, observant and full of adaptability. It quickly came to recognize the supreme merits of concrete as a constructive material, and its readiness for almost universal utilization. The manufacture of cement in America was in consequence vastly stimulated, and its merits greatly improved within a decade. Until within recent years nearly all standard cements in use had been imported from England, Belgium, France and Germany. At present a very large portion of the whole is of domestic origin, and much of this is of the highest grade. Our engineers, at first doubtful, were gradually converted to a strong belief in its many desirable qualities, those of strength, durability, fire resistance, mouldability and long life in sea-water particularly.

During the early, primitive era of American engineering construction, timber with iron connections for framing, bridge-work, etc.; and brick or natural stone for other structural work were in common use. As manufactures developed, cast-iron and then wrought-iron and rolled-iron supplanted them in large part, as finally did steel, in great measure. We had thus progressed from ancient days through the stone, timber, iron and steel ages, successively.

Now has come the age of concrete, and especially of "reinforced concrete," of which almost any engineering or architectural structure may very well be built, and which has largely substituted itself for steel. Even girders, simple or continuous, and columns, subject to flexure, are no longer avoided by the designer, if to be built of properly planned reinforced concrete; while arches of it in long spans, with small rise, are in quite general use.

One of the newest applications of this most adaptable material, concrete, occurs in pile work in marine construction or for foundations in yielding soil. In the latter case, timber piling formerly almost universally adopted, is more and more in modern engineering replaced by concrete piling, simple or reinforced, and made either in place, or driven after the completion of the pile. The freedom from danger of decay often occurring in timber is thus secured, as well as a better bond with the superincumbent masonry.

In the case of pile work in sea-water, the greater danger of destruction of timber piles by the action of the "teredo navalis," and the "limnoria terebrans," as well as the decay of the head of the pile by "wet rot," has, in the recent past, been avoided by the thorough creosoting of the timber before its driving; but this is a very expensive process.

A "transition period" from timber piling to the concrete method occurred when a system of timber piles with grillage and platform upon their head was established. The timber work was placed in troughs, dredged in the mud or sand far below their natural surface level, and then afterwards protected by re-filling by the dredger, a concrete pier, plain or reinforced having been previously established upon the platform.

The latest development in this line of marine work in our harbors along the Pacific Coast is the concrete pile or pier, plain or reinforced, solid or hollow, sunk, and established at the proper depth, inside a hollow cylinder or other form made of wood; which, in some instances, is removed after the concrete has become mature; and may be used again for another pile. Such piers or piling, properly designed, are worm-proof, have great strength, durability and sufficient flexibility.

The Pacific Coast has an abundant supply of excellent material for timber piling of the best quality; and such method will undoubtedly continue to be used for construction in the less heavy and expensive works in our lakes, fresh or alkaline, and in our rivers; principally on account of its cheapness and ease of handling; but in sea-water, which is always infested with the germs of the teredo and limnoria, the concrete piles and piers will, in the course of time, and especially in constructions of the first class, entirely supplant the other.

Concrete, plain and reinforced, are, respectively, the dirigible and biplane of engineering construction.

They have come to stay, and as fire-proof materials are invaluable. Their practical applications in the arts will continue to increase in numbers for a long time to come.

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You can't get fifteen dollars' worth of service out of an eight-dollar man any more than you can get forty dollars' worth of wear out of a fifteen-dollar suit of clothes.

Mausoleum for Mr. D. Schweitzer, San Francisco
Herman Barth, Architect

Greek Doric Mausoleum

ARCHITECT HERMAN BARTH of San Francisco has designed a mausoleum which is now being erected at Home of Peace cemetery for D. Schweitzer. The design is Greek Doric, and is arranged for six receptacles. The foundations and walls are concrete, faced with granite. The interior is to be finished in white marble, with bronze doors and fixtures. The building will cost about $8,000.

* * *

Poet—Will you accept this poem at your regular rates?

Editor—I guess so—it appears to contain nothing objectionable. Go to the advertising department and ask what the rates are. How many times do you wish it inserted ?

The Ford Bungalow, Pasadena, Cal. Greene & Greene, Architects

The Bungalow*

WHEN they first began to build bungalows in California the prediction was made that we would outgrow this type of construction and follow more closely the style so common in the East—the two-story and basement house with gabled roof and attic. Fully ten years have passed, however, and the bungalow still is with us, in fact, is more popular today than ever before, and in the East they are building almost as many bungalows as old style box houses, with their high ceilings, cold entrance halls and stiff, unused parlors. The fact that the bungalow has found favor in other parts of the country dispels the notion that it is adapted only to tropical countries. The bungalow, to be sure, came to us from India, where light, low, roomy houses are demanded, but experiments have demonstrated that this type of home can be made just as practicable in cold climates as in warm, the main idea being to build close to the ground, giving a feeling of nearness to nature, and at the same time develop something that would be at once beautiful and comfortable.

In the planning of the interior arrangement of houses, the old way was to get satisfactory arrangements of rooms inside a quadrilateral ground plan. With the bungalow, the units are the rooms, which are arranged as desired, and the exterior is made to harmonize, combining graceful outlines with inside comfort, grace and convenience.

The bungalow need not necessarily be a one-story structure although the natives of India seldom built higher than one story with low projecting eaves and piazzas or porches extending around all four sides. A two-story house built in modern times is frequently and not incorrectly styled a bungalow. High ceilings are dispensed with and the eaves are made to overhang so as to give the house a low, sweeping appearance—the nearer the ground the better.

The illustrations accompanying this article are selected as typical California bungalows, varying in cost from $4,000 to $50,000. Most of them are in Southern California, where climatic conditions are, indeed, ideal for this type of construction.

*We are indebted to the Paraffine Paint Company for many of the bungalow cuts accompanying this article. It is of interest to add that this company's well known Malthoid roofing was used on the houses herewith illustrated.

House of Mr. John Parkinson, Los Angeles, Cal.
Parkinson & Bergstrom, Architects

Bungalow of Mr. Gamble, Pasadena, Cal.

Bungalow of Mr. A. L. Aylesworth, La Crecenta, Cal.

Home of Mr. G. Lawrence Stimson, Pasadena, Cal.

Bungalow of Mr. Grable, Pasadena, Cal.

Patio of the Ford Bungalow, Pasadena, Cal.

Another View of the Ford House, Pasadena, Cal.

House for Mr. May, Pasadena, Cal.

Mission Bungalow of Mr. George H. Coffin, Hollywood, Cal.
L. B. Volk, Architect

House of Messrs. Glasscock and Edwords, Pasadena, Cal.

The Cole Bungalow, Pasadena, Cal.
Greene & Greene, Architects

Bungalow of Mr. George A. Clark, Huntington Terrace, Pasadena, Cal.

The Taylor Estate, Berkeley Hills, Cal.
Louis C. Mullgardt, Architect

Bungalow of Mr. G. Lawrence Stimson, Pasadena

Residence of Mr. Brunswig, Los Angeles, Cal.
F. X. Lordon, Architect

Bungalow of Mr. French, Pasadeno, Cal.

House of Mr. Dwight Fargo, Los Angeles, Cal.

House of Mr. J. B. Sturtevant, Los Angeles, Cal.

Bungalow Office Building for a Southern California Factory

North View of the French Bungalow, Pasadena, Cal.

Ruminations and Cogitations

By F. W. FITZPATRICK.

A LONG time ago I wrote a criticism of the great architectural display at the St. Louis exposition for one of the magazines. It was not overly hypercritical, but I did flatly say that from the aesthetic standpoint of composition and handling, the work not only did not surpass the Chicago World's Fair, but was far from even equal to it. Prior to the Chicago exposition there had been nothing really worthy of note, in this country or elsewhere, along the lines of exposition work, therefore was Chicago original in conception. Furthermore, it certainly was grand in design and masterly in execution. In St. Louis they had Chicago for a precedent, and a lot of other good work of that class by which to be guided. They didn't want to frankly copy anything which had been done at Chicago, and yet they could not get away from the latter's thraldom, and the result is that the whole thing savored of Chicago to a degree but was rather spiritless. There were dashes of genius here and there, and some very passable work, but, taking the whole composition into consideration, no competent and unprejudiced judge would contend for a minute that it was anywhere near the standard set by Chicago, in spite of the fact that vastly more money was spent, and, all things considered, a far better opportunity and greater natural advantages were offered there than obtained in '93 at Chicago. Some of the men who made '93 celebrated are still living and the Exposition Company had the entire country from which to select their architects, so that there was no valid excuse for not having the very best men do the work. Judging from the St. Louis affair and the general trend of the work throughout the country during the past ten years, I contended in that article that though more money was being spent than ever before, and the opportunities for the skillful handling of problems were better than had ever been enjoyed, yet our architecture reached the zenith of its glory in '93, the exposition was its apothesis, that nothing had since been done which merited comparison with that work, and that as art is never quiescent, but must be ever moving on or retrogressing, then I was justified in saying that our architecture was, to put it bluntly, decadent.

For some reason or other that article was very widely quoted. Many of the daily papers belabored me most thoroughly for so "maligning" the Louisiana Exposition; others agreed with me in part; some architects (who undoubtedly had not been invited to design anything at St. Louis) loudly applauded me, while others, the dear ones upon whose toes I may have trodden, however lightly, wrote me in prayerful protest against my "unjust criticism" and suggested public and ample retraction. One of the great weeklies recently revived the discussion and took me to task for saying that architecture was decadent in this country, when there had been so much progress in the last fifty years. In this I agree with the editor most thoroughly. We have progressed, and wonderfully, in the last fifty years, so much even that seventeen years ago we did work that has never been paralleled since and that equaled anything that had ever been done in the world before, even when art, and not commercialism, occupied the center of the stage.

* * *

So I must still contend, in spite of the editors, the architects et al., that we have progressed wonderfully in engineering and all that sort of thing in the last seventeen years, but have made not one step forward architecturally. The proofs are all about you. Look in any direction and you will see new buildings, fine specimens of the engineer's science, of costly materials, lavishly ornamented but sadly lacking artistically.

Two things are very much to blame. One is our commercialism, our intense hurry to get a thing up and paying interest and the consequent lack of opportunity to properly study the problem in hand. The other is the milk-and-water tone of our architectural press. There is no healthy criticism today. Week by week we are served up exquisite reproductions of fair, bad and indifferent architectural examples. The cuts and the letter press may be marvels of presswork. You will find more or less learned treatises on subjects more or less connected with building, scholarly, academic, true, but seldom of o'ertopping importance to us in our work. There are beautiful obituaries anent us when we shuffle of; this, that and the other editorial comment that fills up a couple of pages of symmetrically asteriskicized paragraphs—and there you are. Never a good sound drubbing of a fellow who has perpetrated something particularly bad, never a wholesome criticism of an award in competition that is notably unjust and in poor taste, never a good punching up of the profession in general, an urging to do better. O, no, some disgruntled brother might cut off his subscription. Architects as a profession can't bear to be criticised, and as individuals are always and invariably absolutely correct and perfect. All this has its baneful influence. The daily papers naturally take their cue from the architectural papers. The latter convey the idea that everything is well, that we are moving along nicely, thank you, and the daily editor, per se, doesn't know any better, lauds pretty much everything that is done, the great mass of the people follow along in the lead of the papers and think everything is all right, passively unexacting in their aesthetic demands, and Mr. Architect, never being touched up, nor criticised, nor prodded, grows fat and grinds off so many yards of architecture as conditions seem to demand.

* * *

The truly successful brother is the one who has married well, has powerful social connections, is a good entertainer, and gets the work to do. It's no longer a profession, nor an art, and it is a cruel farce to call it so—it is a plain business. In the big offices there are undoubtedly men who design entrances all the time, others who design windows, others who think up fittings. There is no particular rhyme or reason in putting the things together. More like a big mill, where the fellows are specialized. The things fit together mechanically, but when it comes to the architectural part of the program, how on earth can you expect a thing to be well brought out, well designed, when the commercial exigency demands that all the plans and details and contracts be made within a month or so of the time when the building was first projected!

The result of such conditions is the utter inappropriateness, one may say, of buildings. The average, even the top notch brother, doesn't seem to ever stop and consider the fitness of what he calls a design for the situation and purpose of the building he is called upon to create. You find residences planked down on a twenty-foot street lot that ought to be in the country at the end of a fine avenue of grand trees and with gardens all about, trailing vines and the other et ceteras. Out in the suburbs somewhere, with an elegant opportunity and plenty of grounds for a little stretching out and rusticity, you'll find a stiffly formal, narrow, three or four storied brown stone front, and if the artistic spark is not dead within you you'll wonder why under heaven the two fellows didn't copy the right thing in the right place. In the commercial building you will find a much ornamented basement with a plethora of balconies, much rustication in stone, wonderfully carved keys, and then a tall shaft of comparatively plain structure pierced by much ornamented windows, and the whole surmounted with a beautiful Greek temple two or three stories high. Why the Greek temple should be telescoped up on top of that candlestick affair is something beyond my ken—but that's your commercial building; they all do it just about that way. Why they don't frankly encase a steel structure and treat it as a towerlike affair, which tall buildings are bound to be, without going through the farce of great classic columns which carry nothing and that everyone knows are actually kept from falling out by wonderfully complicated engineering devices, is also something I do not know.

* * *

That Greek temple idea, by the by, is much in vogue these days. In fact, I believe it was the Chicago World's Fair that brought it forth, and as architects are worse copyists than dressmakers it has grown and grown, until everything has to be classic. Your government building is classic, your church is classic, your Masonic temple, your house, your stable, your factory, your chicken coop, all must have fluted columns and pediments. No man loves a beautiful example of classic more than I, but I do like to see it correctly placed. I don't want a dog kennel or a dove cote to be replicas of the Parthenon or St. Peter's at Rome. It is a fad and is about due to change or be supplanted by something else soon.

A few years ago the great Richardson did some very good work. I suppose it is heterodoxy to say so, but even some of his work, while very beautiful as reproductions of medieval castles, donjons, rathhauses, etc., was certainly most cruelly forced to serve remotely foreign, modern purposes. Well, the architects of the time liked it and they followed suit, and, lo! every statehouse, church, barn, cotton factory and house had for its prototype the Pittsburg courthouse, of Richardsonian Romanesque. It was a little bit new to some of the fellows, and they did everlastingly twist that rather fine example into strange, misshapen forms. There are few cities in the country today where I do not feel cold shivers running up and down my perhaps supersensitive spine as I pass some of the wonderful miscarriages of the Richardsonian fad.

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Broadly speaking, the architects don't seem to think enough. We noted above that they have pandered so to commercialism that they are not given the time to think. Then, too, they attempt to do too much. They carry on too many buildings at the same time to be able to do full justice to any one. Years gone by the architect would be satisfied with one good, important building at a time. He lived with it, thought out its every detail, it became a part of himself, he logically reasoned out everything he did. How can you logically reason out a building that perhaps twenty draughtsmen are separately working upon and in a factory-like mode and spirit? The result is that the architects take something which has been done before, that seems to fit the passing fancy, however remotely connected it may be with the subject in hand, and they use it, utterly without regard as to the purpose of the building or the propriety of the clothing. They don't live up to the changes, the conditions, that have been brought about by our new ways of living and doing things. For instance, the jail of today is a place of sequestration; criminologists and all of us agree that it should be well lighted, hygienically perfect, a place for detention and reform, not merely one of punishment. Well, does the average architect live up to that in his design for a jail? No. He has some cuts of jails built in times gone by, when thickness of walls was the sole protection against escape, where the cells had to be of heavy masonry, where the prisoner was forced to remain in almost complete darkness, where he was expected to be covered with vermin and to share his food with the rats, and a few of those other little pleasantries that history records was the fashion of those times. He knows what the modern jail should be, yet that old idea is the one that is associated in his mind with a design for a prison, and he forthwith plans something of a bastion-like appearance, with exceedingly narrow windows, deeply embrasured (even if he has to furr out inside of the actual wall), little rounded turrets with peepholes therein, and crenelations on top, I suppose, to offer protection to the bow and arrow men who are there to ward off the attacks of the surrounding barons. He is about as happy in his solution of the commercial building problems. He finds possibilities for architectural treatment in the upper stories, but the commercial exigencies of the case demand that the store fronts offer as much space as possible for the display of goods. So we see great, alleged massive granite walls, ten, twelve, twenty stories high, resting upon beautifully polished plate glass supports. And so with everything else, up and down the gamut of architectural composition; lack of thought, a maudlin attempt to fit some habiliment of prehistoric date, trammeling in its folds, inappropriate in its shape, to our modern requirements, absolutely unsightly, farcical, a burlesque in its new surroundings. What sense is there in planting a facsimile of an old Italian palace down in the busy part of New York to do service as a newspaper office? And that is really a minor offense, comparatively speaking, when we note the great mass of illogical, ill-adapted buildings that confront us everywhere, at every turn. Really, I can think of but one class of building where we can borrow bodily from olden times without opening ourselves to severe criticism (that we never receive). Ecclesiastical work may be along the old lines. You can antedate your churches as far back as your creeds. There is justification for it.

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What we need is good training in architecture, in the fullest sense of the term, not merely the measuring of old examples by any odds and the copying of ancient capitols then we need a good course in logic, something to develop our power of concentration and the ability to grasp the real meaning of things, to comprehend the actual requirements of a subject and to do it justice, and then we need a virile, unhampered, straight-from-the-shoulder press that can and does not fear to tell us where we do right and when we are on the wrong track. There is nothing better than good, healthful criticism; it is an incentive to do better, a retardant to conceit, a spur that may irritate our ribs, but that sends us on with redoubled energy. Continual whitewashing is not good for the soul.

* * *

Concrete Snow Sheds

SNOWSHEDS of concrete are to replace the frame sheds on some railroads in the northern Rocky Mountain region, where the dangers from snowslides have called attention to the need of more permanent and stronger protection to the tracks. The construction of the concrete snowsheds is to be done during the coming summer, so far as it can be accomplished, to prevent in exposed places any possibility of a repetition of the recent disastrous snowslides which swept entire trains from the tracks and brought death to many, accompanied by great financial loss to the railways. Henry Gruber, an engineer of the Northern Pacific Railway, recently made the following statement as to conditions on that line and the means decided upon to better them:

"The Northern Pacific has many dangerous passes in the Cascade and Rocky mountains where snowslides are a constant menace in winter to the passenger traffic. There are many similar danger spots along the line of the Canadian Pacific. At most of these places the railways have long wooden snowsheds, but these have not proved effective in preventing accidents. In many cases avalanches and immense snowslides have swept these structures completely away, though they were built of the most massive timbers that could be obtained.

"The roads have learned that wooden structures won't do, so this summer all these snowsheds are to be replaced with great concrete structures which will be built so strong and enduring that even a cyclone would not be able to budge them. People in the East who have never seen one of the snowstorms of the Rocky Mountains have no idea of the immense mass of snow that covers everything, and they cannot conceive of the violence of an avalanche."

White Enamel for Interior Trim

By CLYDE E. HORTON

WHITE enamel is probably the most popular of all woodwork finishes, very few dwellings being erected nowadays without at least one or two rooms finished in this style. Its popularity is no doubt largely due to the ease with which such woodwork can be made a part of the general color scheme of any room. Then again it is sanitary, perhaps not any more sanitary than many other finishes but it seems to be so, because white enamel demands cleanliness. Few of us can know all the ins and outs of white enamelling but there are many points which should be more generally known in order that thoroughly satisfactory work may be assured.

If the real cause of the trouble with the white enamel woodwork was always known the wood itself would be found at fault in many cases. Of course there are other difficulties which may develop, possibly an insufficient number of undercoats causes the trouble, or the quality of enamel itself may be so poor that in spite of satisfactory wood and good undercoats inferior results are secured. There are three important requisites entering into white enamel woodwork, any one of which will easily ruin the finished result. First, the wood itself; second, the undercoats; and third, the enamel. The subject is much simplified by dividing it into these three parts.

It very frequently happens that the painter is called upon to produce a white enamel finish on some wood which is entirely unsuited for such work. This is indeed unfortunate, but these conditions cannot be entirely eliminated until the home builder is brought to realize that only certain kinds of wood are satisfactory for white enameled work. As long as such conditions exist the painter must make the best of it. He must be resourceful enough to produce a fairly satisfactory white enamel job on certain kinds of wood, not fitted at all for such work.

The ideal wood for white enamelling is birch. This wood finishes to excellent advantage. It is hard and has no prominent grain. It is strong in color and contains no pitch or rosin. Wood which is to be white enameled must be of course properly finished and sanded. Birch meets with all of these requirements admirably, and the question of expense is the only one which should ever debar this wood.

White wood and poplar come next in the list. Both of these woods are quite satisfactory for white enameling. They have no prominent grain, they can be sanded satisfactorily, and do not contain pitch or rosin. They are also light in color. It is therefore possible to work up a good foundation with the undercoatings and avoid any possibility of yellow streaks after the work has been completed and allowed to stand for a year or two. The painter is frequently called upon to produce white enameled work over white pine, and can do so to a fair degree of satisfaction. White pine has some of the qualities of whitewood, poplar and birch. It is light in color and does not carry a very heavy grain. Yellow pine, spruce, cypress or fir would never be chosen by the painter for good quality white enameling. These woods do not finish up satisfactorily, they contain more or less pitch or rosin, and in most cases the strong ridgy grain is not easily smoothed over by the undercoating. On these woods a first coat of shellac is always desirable.

There are nearly as many different kinds of material used for enamel undercoatings as there are ways and systems of manipulating them. Every painter has his own particular way of building up an enamel foundation. The condition of the wood varies to such an extent that the painter requires

*American Carpenter and Builder.

a material peculiarly adapted to these many conditions. The painter must know his material and its peculiarities. Some woods are more porous than others and great care is necessary in the manipulating of any undercoat materials.

Many grades of white lead and linseed oil ranging from the most inferior to the best quality have been used for this work. None of them, however, have been found quite as satisfactory as special white enamel undercoatings, such as is now being made by the big paint manufacturers.** A material of this sort is far superior to lead oil, because of its better color and much finer grinding. At the same time it has vastly better working qualities. It flows out and flattens to better advantage and gives greater elasticity and durability, thus making a more satisfactory foundation for the following coats of enamel. No less than three coats should ever be used in the building up of a suitable foundation, and the best of white enamel work will have four, five and six coats, each one carefully flowed on and sanded down smooth. This foundation is equally as important as the final enamel coat.

In the finishing of exclusive clubs, hotels and all handsomely appointed public buildings, as well as the finest residences, there is a large demand for a higher grade of white enamel finish than can be produced with the standard white enamels intended for use in structures of the average type. In work of this character nothing will more completely thwart the whole scheme of interior decoration than enamel of poor quality. On the other hand there is probably no other finishing material that will lend so much to the finished appearance of any structure as white enamel of a rich full finish in just the proper tone of pure white, ivory or cream.

It is essential that white enamels have perfect working, flowing and drying qualities and produce a full surface and lustre that stays permanently white without tendency to crack, mar readily or perish. The tendency to turn yellow has been one of the manufacturers' greatest problems. In order that white enamel for exterior purposes may be durable, it must necessarily be slow in drying. It will not dry hard in less than four days, and on account of its great elasticity, it should not be rubbed until bone dry.

For much of the interior work the painter requires an enamel which will produce a full gloss surface or which can be very lightly rubbed. An enamel of this character can dry dust free in ten to twelve hours, hard in two days and can be rubbed lightly in five or six days. It must dry with a full rich lustre, and must of course work and flow perfectly, in order that all brush marks may be eliminated.

Two coats of this material must be used in order that a satisfactory rubbed or polished finish may be produced. Exceptional care must be taken with the drying of each coat, as well as the sanding of the first coat, preparatory to the application of the finished coat. This material is particularly adapted for use on fine interiors, and high class ornamental and decorative work, which usually requires rubbing or both rubbing and polishing. On account of having quick, hard drying qualities, an enamel of this character is capable of taking and holding a high polish. Such a material will not successfully endure exterior exposure, and should never be used for such purposes. It should dry dust free in three hours, hard in twenty-four hours, ready for rubbing in seventy-two hours, and be safely polished the following day.

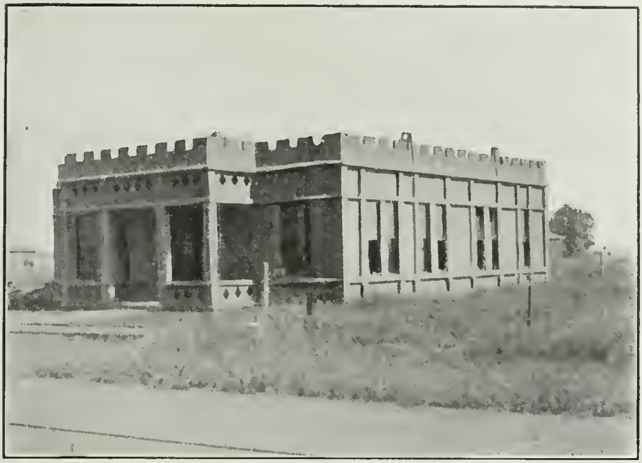
In producing the dull finish only one coat of the enamel will be found necessary. Extra precautions should be taken with the undercoat, because of the fact that this final finish is left as applied.

**For obtaining best results with Satinette, a white enamel that will not turn yellow, the following mixture is recommended: Four coats pure white lead in oil, broken in pure spirits of turpentine, two coats of Satinette; by adding to the last coat of lead 25 per cent of Satinette an extraordinary fine finish is obtained; for semi-gloss finish rub final coat of Satinette with pumice stone and water.

Market Street Theatre, San Francisco
Charles C. Frye, Architect

Concrete vs. Brick

Unquestionably concrete and cement and kindred material is gaining in favor, says "Brick." This condition is emphasized in some of the suburban districts of New York, where concrete or cement houses are becoming more and more common. Everyone knows that cement is not as good as brick. Even those who specify it admit that; but they also declare that the cost of brick construction is so heavy that they cannot afford it. Possibly there is some truth in this assertion; though cost should be considered as a relative term, and the man who wants a good house, one to last unblemished a lifetime or longer, will make no mistake in specifying brick. What cement and concrete will do after some years have elapsed it is impossible to say. They have not been used long enough to afford any opportunity of judging.



Concrete House, Lodi, Cal.—Designed and Built by the Owner

A Modest Home Designed to Resist Fire and 'Quake

By F. J. BEATY.*

WHEN I designed and erected my house I had three objects in view: I wanted a home that would be fire-proof, quake-proof and comfortable. I believe I have been successful in accomplishing all this and a little more. The house, while extremely plain and simple, is not without some architectural merit. When I started to build I invited several architects to get me up something in the way of a cottage that would look well in concrete, but none of them had any idea of anything except frame or brick structures, which styles are not suited to concrete construction. I went way back to the old Moors for my design and modified it to suit the California climate.

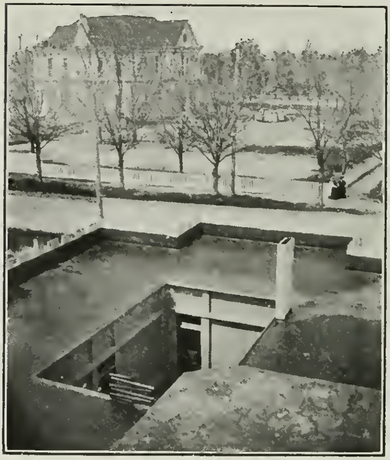
In the inside arrangement I aimed to make it as convenient as possible after about thirty years' experience in building.

The foundation is ordinary 1-to-7 concrete, bonded at the corners and intersecting lines with iron bars and wire. On this I cast the beams 4″ x 16″ and then the 4″ floor slab. The beams are reinforced with two ¾″ wire cables that is "frazzled" out, bonds in the floor slab at each end and passes under a bearing pin at the bottom of the beam in the center. The roof beams are the same. The floor slab is reinforced with No. 6 wire mesh 6″ x 10″. I finished the floor with marble dust and cement so that it looks like grey marble. I used the "two-piece" forms and cast 10 inches at a time and could cast two runs per day. The columns at doors and windows are 8″ thick, the panels recede 3¾″ so that the thinnest part of the wall is but 4¼″.

The window sills form a continuous belt and are 3″ x 10″ and the top of the windows are the same and reinforced with two ¾″ wire ropes that go completely around the building. This construction gives the same strengthening effect as the I beams in steel structures.

*Home address, Lodi, Cal.

The wall is reinforced the same as the floor and stapled to the 2″ x 6″ redwood frames. There are no pockets in these frames as I used spring balances instead of weights.



Showing Roof and Court

The water, gas pipes and electric wires were cast in the concrete as the building went up. I "floated" and finished the walls outside and in, so there was no plastering to be done afterwards. The partitions are made the same as the outer walls, being 4″ thick and plain on both sides. All concrete above the floor is mixed 1 to 6. I built a 4800-gallon concrete water tank over the back porch by building the battlement wall 20″ higher and erecting a 4″ wall on the other two sides. This is covered with a 2″ slab of the same material.

I cast a bath tub of concrete that is as good as any enameled iron tub sold in the market. Also a pair of wash trays. The inside finish, window stools, aprons, plate-rail, and mantel are all marble effect and make a neat looking job. The ceilings were cast on rough sawed boards and left to show the "grain," and hundreds have asked me if I am not going to take down the "boards." I intend to leave them.

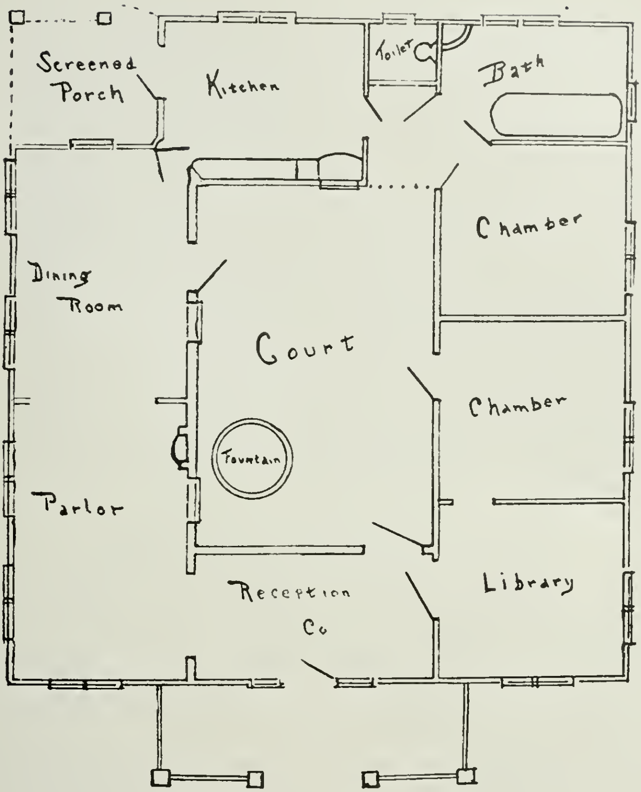
All my inside finish is gray marble; mantel, window stools, plate-rail, etc., are cast as part of the wall.

The only wood inside the house is the astragal molding on the window jambs from the "stool" to the picture mold, which finishes the tops of the frames.

This wood molding is only 1¼″ wide and ½″ thick, so I guess it would not make much of a fire.

I find that the cost of this house was about 15 per cent greater than first-class wood construction and far cheaper than brick. With an up-to-date septic tank and sewer system and a steel windwheel and tower, I think I have one of the best houses, if not the best in the state, and when the fire-bell sounds an alarm I only feel sorry for my neighbors—it doesn't scare me—for I am reasonably sure my house won't burn.

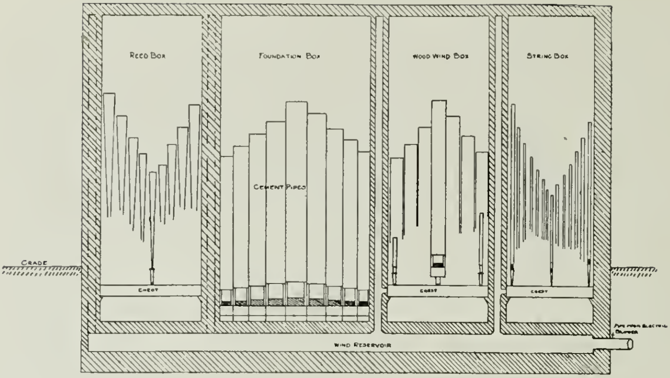
Concrete Fountain and Gross Plot in the Court



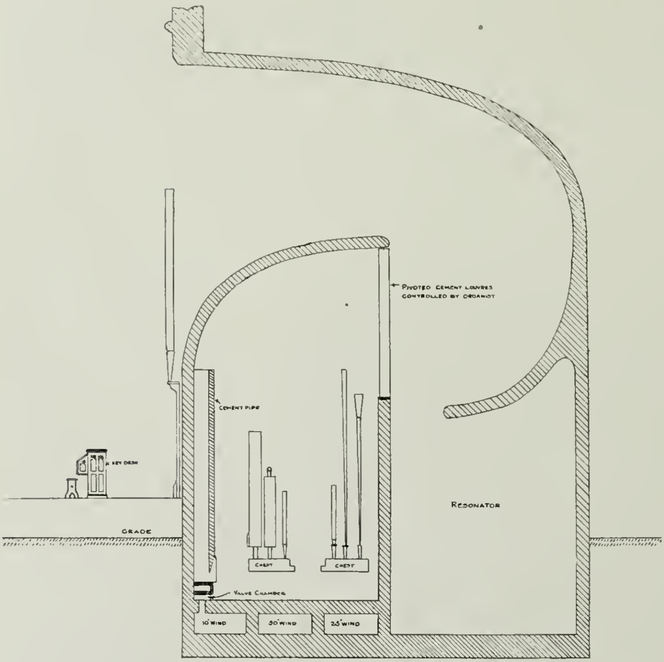
Floor Plan of Concrete House, Lodi, Cal.

Quarter-Sawed Lasts Longer

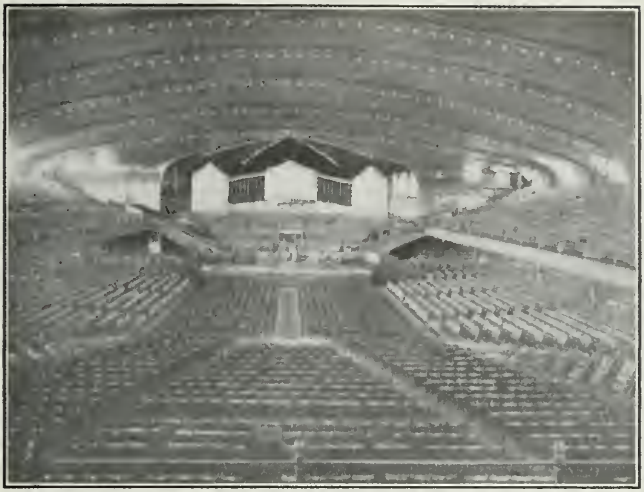
A taste for ornamental effects is manifested by users of hardwood flooring, just as the selection of hardwood panels for hardwood doors and parlor furniture, and there is a constantly increasing demand for quarter-sawed stock. Although the plain sawed is almost indestructible, it is said that quarter-sawed wood will wear longer. Quarter sawing means that the wood is sawed so that the surface is at right angles to the rings of growth. The cost of producing it is much greater than the plain sawed, as more waste of wood is involved, the labor is heavier, and only very large and high-class logs can be used.



Sectionol Elevotion of Reinforced Concrete Organ at Ocean Grove Auditorium



Sectional End Elevation of Reinforced Concrete Organ at Ocean Grove Auditorium.



Interior View of Auditorium, Ocean Grove, New Jersey—Showing the Organ That Has Been Largely Constructed of Reinforced Concrete

A Reinforced Concrete Pipe Organ

ANOTHER use has been discovered for cement, this time from a most unexpected quarter. An organ builder of Elmira, N. Y., says Cement Age, has set the musical world in a flutter of excitement over the wonderful musical effect produced by his Orchestral Unit Organ—largely constructed of reinforced concrete.

A specimen of his work at the great Auditorium, Ocean Grove, N. J., has been attracting much attention. Madam Schuman-Heink describes it as "the most wonderful organ in the world," while Nordica and other great singers are equally loud in their praise. Composers, such as Hadley and Homer-Bardtlet, declare that it marks the dawn of a new era in orchestral music. The National Association of Organists held a great convention at Ocean Grove, N. J., attended by hundreds of organists drawn from practically every state in the union. The Association unanimously passed a resolution acknowledging "the epoch-making advance" achieved and saying that if the inventor's genius has free scope a marked uplift to the musical life of the world will result.

The new form of organ has, therefore, evidently come to stay and we present a few of the details of construction.

The instrument at Ocean Grove is not a perfect and complete example of the builder's wonderful invention, yet it has attracted such general attention that over 100,000 people have paid for the privilege of hearing it during the summer and more than half of the cost of the instrument has thus been recovered in less than three months.

The Orchestral Unit Organ is like the church and concert organ in but one particular, namely, that in each, the tone is produced by wind blown through pipes. Even here the resemblance is not great, for in the church organ a great quantity of air at a low pressure is used to blow many thousands of pipes, whereas in the Orchestral Unit Organ there are but few pipes and the wind used is of high pressure.

Apart from the metal pipes, the church or concert organ is a delicate machine constructed mostly of wood, leather and glue, affected by every change of temperature and readily damaged by moisture. On the other hand, the Orchestral Unit Organ is constructed largely of reinforced concrete, has practically neither leather nor glue and is absolutely impervious to weather changes.

The Orchestral Unit Organ is smaller and less complex than its older rival. It is also less costly, though it produces much louder and more expressive musical tones.

Hitherto it has been considered for reasons having to do with acoustics, that wood should be employed in the construction or lining of organ chambers. Architects will be interested to learn that Robert Hope-Jones, the inventor of the Orchestral Unit Organ, judges wood to be about the worst possible material for employment in this capacity, and considers concrete or stone to be the best. In all organs the tone originates in the air and contact with anything calculated to absorb this tone is to be avoided. That is why he prefers concrete to wood. It is stated that the effects he obtains border on the marvelous. The Ocean Grove organ has but 14 ranks of pipes—as compared with 100 or even 140 in other organs—yet the Ocean Grove is easily the most powerful organ in the world. All its tones are reinforced and reflected by cement.

In the Orchestral Unit Organ monolithic construction is, where possible, employed. There are chambers and passages for compressed air, including four or five chambers for the pipes. The larger of these pipes are themselves of concrete, being formed in the walls of said chambers. Other features are, parabolic tone reflectors, resonance chambers, supporting corbels, and cylinders for shutter motors, etc.

There are no bellows, regulators or moving wind reservoirs. Electric motors compress the air at definite pressure into the concrete chambers and the wind chests and pipes are in direct and ample communication with these chambers. By this means a perfectly steady supply of wind is at all times available. This plan of relying upon the compressibility of air itself instead of upon the varying capacity of a collapsible reservoir is absolutely revolutionary in organ work, though it was tentatively tried by Mr. Hope-Jones in the organ he built for Worcester Cathedral, England, in 1895.

Each of the four or five chambers named above for containing pipes will measure perhaps 8 or 10 feet in each dimension (dependent, of course, on the size of the instrument). The top of each chamber is closed by a set of Venetian shutters with patent sound trap joints. These shutters can be opened or closed at the will of the organist—thus enabling him to govern the amount of tone emitted from each chamber. One chamber contains the foundation tones of the organ (Diaphones, Tibias and Diapasons)—one, the "wood wind,"—another the orchestral "string" tones—another the "brass" and a fifth the "percussion." By this means each department of the orchestra is properly represented and each is under separate control. The performer can control any of the pipes at any pitch and power, from any keyboard he may be playing upon.

The reeds used in the Orchestral Unit Organ have no tuning wires. They stand in tune of themselves and do not require the constant tuning and attention demanded in the case of church, concert and house organs as hitherto constructed.

The Orchestral Unit Organ being independent of climatic conditions is suited for out-of-door use in public parks, recreation grounds, etc. At the moment of writing one is being arranged to go below high water level, under a sea shore pavilion, the tone being reflected in parallel lines over the entire floor of the pavilion and from thence to the end of the pier. The parabolic concrete reflectors direct the tone wherever desired and prevent its dissipation into the surrounding air—just as is done with light waves in the case of a searchlight.

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A Woman Architect

A DISGRUNTLED woman in New York spoke for all her sisters yesterday when she lamented the inefficiency of men architects from the feminine point of view. She had just finished a nerve-racking muscle-tiring, search for a house that was convenient; not merely one to live in and to beautify, but for the easy and successful carrying on of the business side of the home.

Her quest had been in vain. She found houses galore that would have been ideal if all life were to be spent in the spacious drawing room. It was there that the artistic mind of the architects found successful expression, but then her practical criticisms began.

Kitchens were not as large and as convenient as they should be. A woman's eye noticed that the usual place for the range was over in a dark corner; that the sinks were not placed where they would be the handiest and that, as a general thing the dining room wasn't properly convenient to the kitchen and butler's pantry.

But it was when she came to the subject of cupboards that she reached the high-tide of her indignation. No man ever realized the feminine need of countless cupboards; no man ever placed the few right that he did condescend to give. Then, too, men architects hadn't enough knowledge of the toddlers of a household to make the stair railings high enough to save clambering children from accidents and most of them were so set on having houses that looked artistic from the outside that they forgot internal comfort and would put windows in nurseries that were so high that no child could ever look out of them.

There were many clauses in her indictment, to all of which the rest of the sex will subscribe. The only way to give satisfaction to women in the matter of houses and apartments will be for other women to design them. There is a big legitimate field for this employment of feminine skill and experience. There must be experience, however. The young collegiate who has spent most of her years away from home, would probably be just as much a bungler as mere man.

It doesn't follow that this feminine architect should be a wife and mother, but certainly she should be seasoned in housekeeping. Nowadays there is often an elder daughter who takes up the reins which the mother is glad to relinquish. Such girls know from practical experience the kind of houses the home-making women need and they would draft them. And if they hadn't the necessary technical training, they could act as advisers and destructive critics of the plans of their technical sisters. It wouldn't be a bad idea, either, for men architects to have such everyday wisdom at their call through just such practical girls on the staff of their offices.—Cleveland Leader.

Face Brick and "The City Beautiful"*

By R. M. COMBS

IF A tailor were to show you a suit of clothes, the front of which was of the finest, up-to-date, attractive material, with sides and rear elevation made of the fabric used in your underwear, what would you think of him and his shop? You would like to say he was crazy, but his name is "Custom" and he is bigger than you. You think of his age and resolve to reason with him that the entire suit would look best made of the same goods all around. So it is with a building. Buildings look to a man who has ideas for a "City Beautiful" like this suit of clothes, built with a finished front and a common rear and sides.

The average unattached residence or apartment building may require from five to ten thousand face brick and from fifteen to thirty thousand common brick for the other three sides. Stop and see how little more it will cost you to build entirely around with face brick. In the first place you cut common brick out of all exposed wall surface and replace them with the same brick used in the front. These, in many instances, are larger than the common brick, consequently not so many required. The cost of laying in many cases will be the same. If it should be more, the increase per cent is such a small item in the total cost of the building, that it is hardly discernible.

In the large cities "sky-scrapers" towering above the surrounding buildings, as they are built today, look from the rear and sides like grain elevators backed up to be unloaded. With a little study and thought of a "City Beautiful" these giant blank walls could be made to assert the fact that they are office buildings. By using the same brick all around or by using a cheaper brick that would harmonize with the facing material, this effect could be accomplished. This is especially true of Chicago, because, within a radius of one hundred and fifty miles there are being made every day hundreds of thousands of good and beautiful red and brown brick that can be purchased for very little more than the cost of common brick and laid in the wall with no more expense than common brick.

The interest in the creation of a "City Beautiful" has been taken up all over the country by boards of trade and every citizen who has a pride in his town. They have spent vast sums of money in plans for parks and boulevards, making choice localities for buildings which the wise man will construct of brick and the wiser man of the same brick on all exposed surfaces.

The manufacturers of cement are spending thousands of dollars annually in publishing plans and literature that advocate concrete as the artistic building material and are able to point to many beautiful homes made of the same material all around. These people have so widely advertised their material as an artistic, durable and inexpensive building product, that the Coliseum in Chicago and other large buildings throughout the land are filled to overflowing at their annual shows. Architects and owners swarm there looking for something they can use on all four sides of buildings that will make them look like a whole structure and not like a stall with a curtain let down to serve as the front.

In contrast to our cement friends, what are we brick men doing toward the creation of the "City Beautiful"? We brick manufacturers allow the architect and owner to disfigure our best localities with an abortion that has one kind of brick for the front and a totally different one for the balance of the building. We do this without a murmur or an effort to correct this deplorable condition.

*Extract from paper read at the Annual Meeting of the Clay Manufacturers' Association.

Are we to let the face brick industry die the natural death that overtook stone as material for fronts? Stone men thought everyone knew what they had and sat back allowing Tom, Dick and Harry to come to them. They had no thought of the "City Beautiful." It shows in the buildings.

Let every brick maker wake up to the fact that by constantly suggesting to a customer the use of face brick all around, we will shortly compel him to see the necessity of making his building look balanced in design. In my opinion this subject is a most important one and I sincerely urge every one of you to wake up to the fact that we have got to show architect and owner how little more it would cost to use the same brick throughout for facing and that by so doing he would have his color scheme complete.

It is for each one of us to push this spirit of a "City Beautiful" from our own standpoint. If we find a man so in love with common brick, suggest his making his front of the same thing. Even this will give harmony in color, and will be an improvement on the arrangement of the suit of clothes to which I have referred.

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Teak for Interior Trim and Furniture

By F. J. WHITE

THE latest fad, and by far the most expensive in interior trim and high-class furniture, is teakwood. The moderness of this fad, however, applies only to the United States, as for a thousand years or more, in China, as well as in other parts of the Orient, teak has been the highest prized wood for furniture, shrines and religious objects. The famous blackwood furniture of that part of the world is made of Siam or Java teak.

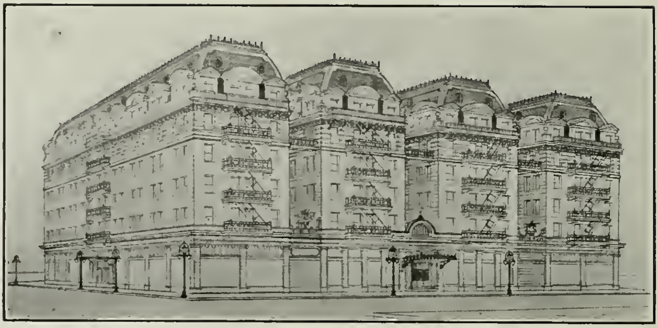
In Europe, more especially in England, the highest class of bank fixtures have been invariably made in teakwood. In the southern part of this state, in Los Angeles, San Diego, Pasadena and thereabouts, teak has been used in a large number of the magnificent mansions erected by wealthy eastern people in that section so aptly termed the millionaires' playground. In the majority of these palaces teakwood is used for interior trim, staircases, etc., with artistic, especially designed teak furniture to match.

The beautiful new Havens residence, in Oakland, is being fitted up with doors, wainscoting, beamed ceilings, and floors of teak, and hand-carved furniture of the same wood. A prominent San Francisco furniture maker is busy at the present time on a large order of special designs in teakwood furniture for a wealthy family, the members of which have always possessed the most correct taste in matters of art, and a number of the designs were drawn by the two talented young daughters of the house. This special furniture, by the way, is very costly, as teakwood in the plank is worth $250 per 1,000 feet, and is the highest-priced wood known. The finished article, however, is well worth the money and labor and artistic effort expended upon it, as there is nothing in the world in the line of house furnishing in which more refined taste and individuality can be displayed than in the designing and selection of carved teakwood furniture.

* * *

Portland to Have Notable Building

Plans are being prepared by Architects Frank B. Gibson and B. J. S. Cahill for a handsome $750,000 store and hotel building to occupy an entire block, bounded by Third, Fourth, Pine and Ash streets, Portland, Oregon. The construction will be class A with steel frame, concrete and tile fire proofing



Design for Hotel, Portland, Ore.
Gibson & Cahill, Architects

and partitions and no wood at all anywhere. The building will be T-shaped with stores and offices and 650 rooms, exclusive of servants' quarters in the attic, lobbies and reception rooms. The owner of the proposed building is the R. R. Thompson Estate Company of San Francisco and Portland. A contract has already been let for wrecking and clearing the block.

* * *

A City Paved Exclusively with Brick

ON THE western border line of Arkansas, so near Oklahoma that it will in time run over into that state, Fort Smith has, by go and enterprise, gained the right to be classed among the most progressive cities in the world. Some years ago, after experiments that proved the superior durability of brick pavements, it was decreed that all her streets and alleys should be paved with brick and nothing else. For a number of years the work of permanently improving the city's thoroughfares has been pushed vigorously until now she has nearly one hundred miles of smooth, clean, sanitary streets—more good paved streets than any city of her size anywhere. The splendid work is going on at the rate of a dozen miles or more per annum, and will be continued until every street and alley within and about the city is paved with brick.

The tax payers of Fort Smith, says a writer in Clayworker, are already feeling the benefits of this improvement in a material way, for good brick pavements, once laid, require no repairs, and so there is virtually no expense at all for maintenance. On this account it is believed that ultimately the city's tax rate will be lower than that of any city in her class where other paving materials of a perishable nature have been used, and are still being put down, entailing a constantly increasing expense for repairs and replacements.

Fort Smith now has a population of 35,000, and is the center of a most fertile and resourceful fruit and agricultural region, a vast territory rich in timber and mineral wealth. One of her most valued natural resources is an apparently inexhaustible supply of natural gas. This insures cleanliness, a freedom from smoke and grime, while affording a cheap fuel supply for all industrial and domestic purposes. The city's geographical location makes it a great distributing center from which six railways afford excellent transportation facilities.

The "Bungalith"—A Concrete House of Separately Molded Units

By THOMAS HALL.

THE "bungalith" is constructed of upright, molded concrete sections or units that reach from the foundation to the height of the story and when these are joined together the building becomes practically a one-piece structure. The units are interchangeable and connect together by a tongue and groove or a cement mortar joint in various combinations. They are adapted to form different rooms and rooms of different sizes, molded with an outer surface and an abutment in one piece, the abutment determining the thickness of the wall. The units or slabs can be made where gravel and sand are plenty and transported like lumber to the place of erection, and they may be placed in position on the foundation by common labor.

Resting on top of the wall and on its abutments are concrete plates or slabs molded to fit the wall sections and bind them together. A portion of the slab may project from the face of the wall, forming a molded ledge or cornice, the opposite edge forming a cornice in the room. Grooves are molded in the top surface of the plate to admit reinforcing wires, binding the whole together, the grooves being then filled with cement mortar.

These units for building small houses and bungalows may be made in standard molds and numbered so that the architect and builder may select such as will suit the requirements, to conform to designs, or the plans may be made to suit the standard forms.

Floors are made of molded, reinforced concrete slabs and, where necessary, are suported by reinforced beams. Floors of the usual wooden construction may be used if desired. The roof is constructed in a manner similar to the floor, making provision for the pitch for carrying off the water. The top of the wall may be finished by a concrete balustrade placed as an additional story would be placed. If it is desired, a pitched roof of shingle, slate, thatch or other material may be used, to suit the taste of the owner. The house may be built in sections and rooms added or a second story added, without disturbing the construction or occupancy.

Members composing the outside walls form a smooth surface or may be molded as ornamental panels or pillars where desired, and if the natural gray stone color is not wanted, the concrete is readily tinted or the slabs may be molded with white marble faces.

The inside of the house needs no furring nor plastering, as the construction provides for recesses or open spaces between the abutments. The inner lining of the wall, connecting abutment with abutment, will be largely formed of doors so as to utilize the spaces between the abutments of the wall for closets. Full-length closets for the sleeping rooms and book shelves for the living rooms are provided. The remaining recesses may be covered with plaster board to form dead-air spaces or flues.

The doors, window frames and all the inside trim may be bought ready-made, of standard sizes, and will match the standard sizes of the wall units.

Very few low-priced houses are provided with means for properly ventilating and heating the interior. The walls of the "bungalith" construction are said to be practically fireproof flues. A simple arrangement of a furnace in the basement is a convenient and economical method of heating the whole house, the wall spaces providing an abundance of flue space. The flues will also provide a perfect system of ventilation, giving equal heat in

Actual Photograph of the "Bungalith"

Partial Floor Plan, Showing Alcoves

every part of the room, taking away the vitiated air and supplying fresh air. If stoves are used for heating, the numerous flues make good provision for that method and the ventilation is well taken care of.

There is much misconception in regard to the subject of dampness in concrete houses. Instead of moisture passing through the walls, the wet surface on the inside of a building having thick walls of stone, brick or concrete, is often caused by condensation of the moisture in the warm air of the room coming in contact with the cold wall.

To prevent this the plastering is furred off, by attaching to the wall, strips of wood and on these strips nailing lath and applying plaster, which makes the inner face of the wall an inch or more removed from the real wall and leaving air-spaces between the lathing and the wall. The air-spaces, being non-conductors of heat and cold, prevent the moisture in the air of the room from being condensed by the mass of the cold wall.

The "bungalith" contains no furring. The outer walls are comparatively thin and the abutments will not convey moisture to any perceptible extent. The very large air-spaces in the walls, forming closets and flues entirely around the house, insulate the apartments from the outer air.

The ideas combined in this construction were worked out with a view of getting a permanent, fireproof dwelling house at low first cost and low subsequent cost. The amount of material required to make a substantial building is very small.

A fresh-air alcove may be designed as part of the "bungalith."

It is a projecting portion of the room similar to the bay window (and can be used as such if desired) in which the bed may be placed. The bedstead is readily brought into use, the head part of the bed remaining in the fresh air alcove and the lower part of the bed being in the warm room, having a drop curtain separating the alcove from the warm room. This provides a perfect arrangement for sleeping in the outer air and dressing in a warm room.

Another advantage of the fresh-air alcove, in addition to its sanitary improvements, is the great saving of space, permitting the use of the whole room for a day living room; the ordinary bedstead occupies too much room in a small house.—Concrete.

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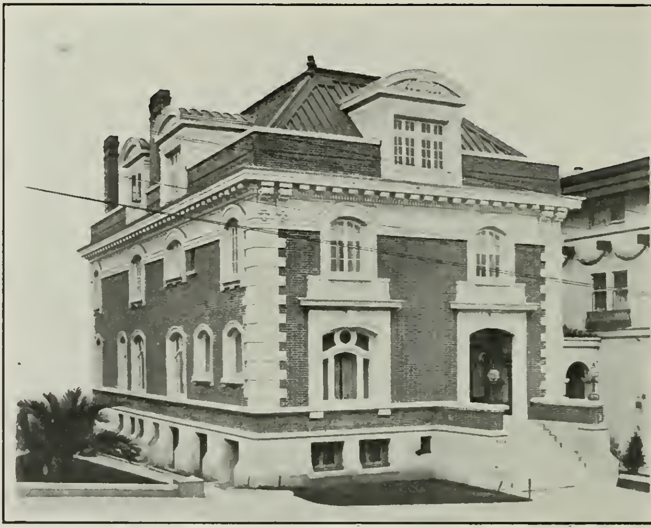
* *

The Business Side of Architecture

At a meeting of the Royal Institute of British Architects, held last month in London, a valuable paper was read by Mr. Alfred Hudson, barrister-at-law, from whose remarks we cull the following:

"One of the first matters with which an architect will have to deal when he confers with his employer is the question of cost, and to this all his ideas must be made subservient. For this purpose he must be trained to measure and estimate, and he must learn the value of different materials. It falls to the lot of very few architects to find clients of unlimited means, and it is still more rare to find even such clients willing to disregard questions of cost. Another example of equally necessary instruction is the proper specifying of the materials and the various works which are required to be carried out. This is a matter in which very great foresight is required, besides a thorough knowledge of every kind of detail. One of the first essentials in the student's instruction should be to teach him to describe accurately the various materials and methods of construction upon which he is receiving instruction during the course of his studies. It is not uncommon to find that a specification has been copied from an obsolete model describing materials which have ceased to be sold or manufactured.



House of Dr. H. Kugeler, San Francisco
T. Patterson Ross, Architect

A Canadian Architect's Views on the Use of Cement*

By F. S. BAKER, F. R. I. B. A.†

I CAN easily recall the days when the only Portland cement came from England in very small quantities and at a prohibitive price. The production of the Canadian article saw the emancipation of the architects from the anxieties of masonry work in lime mortar, and today I doubt if there is a building material which the architect regards with more affection than Portland cement.

It is very gratifying to know that no matter how enormous the quantity of Portland cement required in the operations incidental to the development of this vast country of ours, the raw material is available to insure the use of the Canadian product and protect us against the necessity of importing foreign material.

I think that so delicate a material as Portland cement should be shipped in better packages than jute sacks, and claiming an architect's prerogative, I would ask your consideration of the possibility of improvement in this direction. There is a source of considerable anxiety and annoyance to the architects which I think your chemical experts might overcome with great benefit to everyone concerned. I refer to that ingredient in Portland cement (and all seem to be alike in this respect) which so badly stains any limestone or sandstone with which it comes in contact. Owing to the kindness of the management of the International Cement Company at Hull, Quebec, I was given an opportunity, with several other architects, to visit their works and see the whole process of manufacture from the quarry from which the shale was mined to the jute sacks already referred to.

*Extract from paper read at the second annual convention of the Canadian Cement and Concrete Association.

†President Royal Arch. Inst. of Canada.

Part of the process was roasting this crushed shale and clay in the large cylinders at a very high temperature, and it occurred to me then that the qualities which caused the staining of the stone might be some form of carbon which might be eliminated by a further burning or by some chemical process which would not injure the usefulness of the product. Of course, we use various methods of overcoming this staining, such as painting the back of the stone and using some non-staining cement in making the mortar used next the stone, etc.; but even with these precautions the stains sometimes get through. I have in mind a very fine public building now being erected of Bedford stone, and large areas of the external walls of the building are ruined by this staining.

The subject of concrete will be well covered by various speakers at this meeting; but there is one feature which occurs to me. I refer to the injury which concrete in course of setting receives from any sudden jar. To obviate this where concrete is used for floors in steel-frame buildings, I think the architect should provide additional steel sufficient to insure a stiffness in the frames which would prevent injury to the concrete by the vibration incidental to the erection of any steel-frame building. I have observed that concrete placed in moderate freezing weather—say, 20° and above—which is allowed to set fully without any vibration, seems to be as good as that set in non-freezing weather.

Portland cement has proved very useful in forming surfaces to resist water or tanks to contain fluid, such as cisterns, swimming-baths, egg tanks, etc.; but the success of this depends largely on the mixture. In a case like egg tanks, it is exceedingly important that the walls should be absolutely tight, as the slightest subsidence of the fluid causes the eggs at the bottom of the tank to be crushed. For this reason, concrete seems to be the ideal thing for floors which lie upon the earth, such as basement floors, or veranda floors, or sidewalks. As a finished floor for a building, however, I do not think a cement and sand or marble dust composition is satisfactory, and the same applies to staircases.

Portland cement shows its greatest usefulness to the architect in the mortar which is now almost universally used in the laying up of brick walls. I mean cement mortar, one to three. A brick wall laid in such mortar and grouted with liquid cement grout every few courses, becomes as hard as solid stone, and as compared with concrete, the builder has the assurance of strength, from his knowledge of the soundness of the bricks and of their resistance to crushing. I have watched men cutting an opening through such a brick wall, and the hard bricks generally yield before the mortar. Such masonry is a great comfort to the architect. In it there is no danger of a weak spot, such as might occur in a concrete wall through the carelessness of workmen. No matter what precautions he takes, the architect of a reinforced concrete building must have some anxiety on this score until the building has been thoroughly tested, and, while I say this, I am a great admirer of the wonderful feats which have been performed in the erection of immense reinforced concrete structures, and I am satisfied that it is a practical building process. The use of cement mortar in the building of rubble stone walls is also a great boon to the architect; no rubble stonework should be attempted in anything but cement mortar, where cement is obtainable. The failures which I have seen in rubble stone work would in every case have been avoided if cement mortar had been used.

While the concrete block is a desirable article for a certain class of building, I have not yet seen any which could be satisfactorily used in a building which was to stand as an architectural effort in a conspicuous place. In saying this, I do not include so-called artificial stone, which is a very admirable building material, and, thanks to the cement in its construction, is now obtainable of the highest quality in any quantity. And you get it without delay. In this material, anything which the architect can design of a masonry character can be rapidly constructed and reproduced to an endless number. He is hypercritical who condemns this material because it is an imitation. I contend that it is a sound building material, which can be quite properly used where it is obviously artificial stone.

Of the several kinds of artificial stone, I prefer that which is formed of the same material all through, and not formed, in the main, of one kind of concrete and faced with another. There is apt to be a difference in the expansion and contraction of the two materials and a difference in the retention of moisture, which might reduce the strength of the latter article, as compared with that which is formed of the same material all through. It is clear, however, that an architect must not be drawn into the repetition of a feature so easily obtained in artificial stone in an effort to economize. On the whole, I like artificial stone very much, and wish it every success.

A delightful material for use on the interior wall surfaces of buildings has developed recently, in plaster formed of white cement mixed with ground stones of different colors. Of these, the most used is, perhaps, what is known as Caen stone cement. This is now used to finish the interiors of the public parts of hotels, hospitals, theaters, banks, stores, and even churches. It is applied much as plaster would be, and is laid off in courses jointed horizontally and vertically, just as real stonework would be. The result is almost a perfect imitation of real Caen stonework, and is, as I said before, a delightful interior finish. On account of its plastic nature, the most difficult ornamental work can easily be produced cast from a carved model, which, of course, can be produced as often as desired. The color obtained is splendid, and while it is undoubtedly an imitation and more to be condemned on that score than artificial stone, an architect obtains in its use a most satisfactory result for his client. All the large cities in Canada, and I think I may safely say all the large cities in the United States, have prominent examples of the use of this material for interior finish. In most of these cases all of the interior trim, including the mouldings and ornament, are also formed in the Caen stone cement.

The use of cement has also made possible many embellishments for the exterior of the building which could otherwise only be obtained at great expense. A whole wall surface may now be safely covered with cement plaster, either on masonry work or metal lath, and the craftsman feel assured that it will stay in position, while, at the same time, it may be enriched with scrafito ornament by the skilful carver. On the other hand, a frieze protected by roofs or other projections, can be modelled in relief on the building quite as successfully as a frieze carved in stone and at much less expense.

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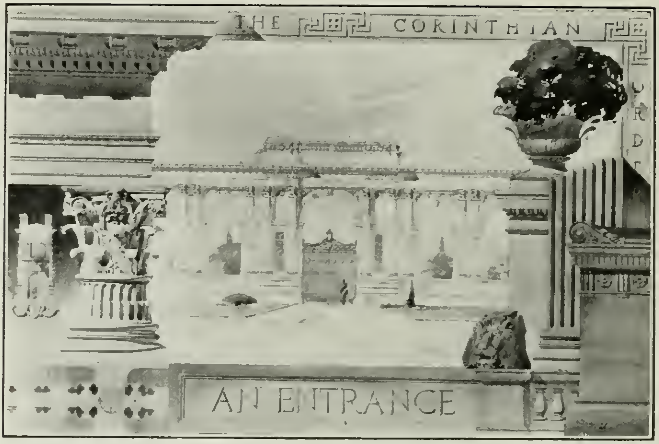
Reinforced Concrete Boats

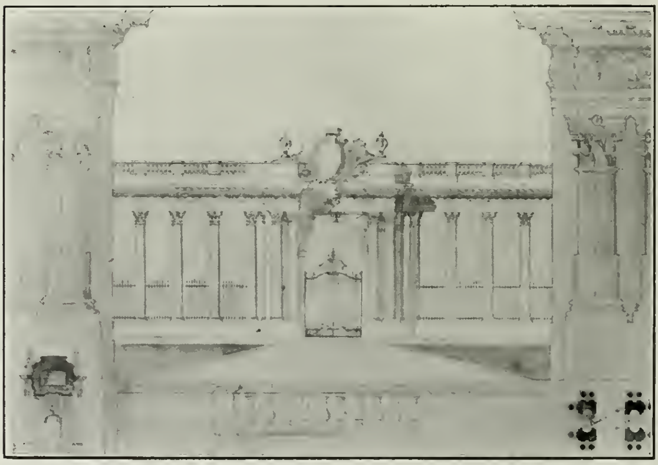
It will puzzle most people, says a Washington press dispatch, to know that a boat built of concrete will not only float, but has a greater carrying capacity, is more durable and even lighter than a strongly constructed wooden boat. The Panama canal commission has just launched on the banks of the Panama canal a big barge built of reinforced concrete, which weighs 60,000 pounds and two others will soon be finished. These vessels, it is said, are unaffected by sea worms, marine vegetation does not adhere to them and they are practically indestructible.

The Sloat Monument at Monterey Which was Dedicated June 14
Bakewell & Brown and Earl Cummings, Designers

School Design with Splendid Mission Treatment
Arthur Kelly, Designer



Designed by T. Bearwold



Entrance to a Court of Honor
Designed by C. I. Harrison

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ROBERT FARQUHAR, Los Angeles, Cal.

NOTE.—The members of the Jury are also members of the Education Committee.

NEXT CONVENTION—LOS ANGELES, CAL
NEXT EXHIBITION—PORTLAND, OR.

RESULTS OF COMPETITION WORK FOR APRIL-MAY

Student Work.—All mentions are credited by the Society of Beaux Arts Architects, New York. First mentions and medals must be confirmed by the New York Society before being credited by them.

THE drawings rendered were all creditable. There were no drawings placed first, as the jury could not agree which was the best. The drawings selected for publication represent typical solutions of the problem, and were selected because it was thought that they would reproduce well, and because they were among the half dozen best drawings.

JOHN BAKEWELL, JR.,
Chairman Education Committee.

There were twenty-two drawings submitted. Of these, twelve received mentions. Two were placed hors concours.

Order problem: Subject, "An Entrance to a Court of Honor." Mentions awarded:

Name.	Award.	Atelier.	City.
Bearwald, T.	Mention	S. F. A. C.	San Francisco
Bendel, T.	Mention	S. F. A. C.	San Francisco
Flanders, Ed	Mention	S. F. A. C.	San Francisco
Frick, Ed	Mention	S. F. A. C.	San Francisco
Jones, Fred	Mention	S. F. A. C.	San Francisco
Monson, R.	Mention	S. F. A. C.	San Francisco
Thibault, G.	Mention	S. F. A. C.	San Francisco
Gould, J. S.	Mention	Arthur Brown, Jr.,	San Francisco
Harrison, C. I.	Mention	Arthur Brown, Jr.,	San Francisco
Warnecke, C. I.	Mention	Arthur Brown, Jr.,	San Francisco
Rosenberg, L.	Mention	Portland A. C.	Portland
Elwell, F.	Mention	Myers	Seattle

To Standardize Cement Sidewalk Specifications

THE following specifications were recommended as a standard for cement and concrete sidewalks by the committee appointed by the convention of city officials called to consider the standardization of paving specifications, recently held in Chicago:

Specifications for Concrete Sidewalks.

1. Cement—The cement shall meet the requirements of the standard specifications for Portland cement of the American Society for Testing Materials, adopted August 16, 1909, with Section 21 of said specifications amended to read as follows:

Tensile Strength—21. The minimum requirements for tensile strength for briquettes one square inch in cross-section shall be as follows, and the cement shall show no retrogression in strength within the periods specified:

Age.	Neat Cement.	Strength.
24 hours in moist air		175 pounds.
7 days (1 day in moist air, 6 days in water)		500 pounds.
28 days (1 day in moist air, 27 days in water)		600 pounds.

Provided, however, if the cement fails to meet the requirements of the 24-hour neat test, it may, at the discretion of the engineer, be held for further tests before being rejected.

One part cement, three parts Standard Ottawa sand:

7 days (1 day in moist air, 6 days in water)	200 pounds.
28 days (1 day in moist air, 27 days in water)	275 pounds.

But in no case shall the increase in strength at 28 days be less than 20% over the strength shown at seven days.

2. Fine Aggregate—The fine aggregate shall consist of any material of siliceous, granitic or igneous origin, free from mica in excess of 5% and other impurities, and shall be of graded sizes ranging from ⅛-inch down to that which will be retained on an 80-pound Standard sieve for the top or wearing surface; and from ¼-inch down to that which will pass a 100-pound Standard sieve for the base.

3. Coarse Aggregate—The coarse aggregate shall be sound gravel, broken stone or slag having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of sizes that will pass a 1-inch screen and be retained on a ¼-inch screen.

4. Water—The water used in mixing the concrete shall be clean, free from oil, acid, strong alkalies or vegetable matter.

5. Base Proportions—In preparing the concrete for the base, the cement and aggregate shall be measured separately, and then mixed in such proportions that the resulting concrete shall contain fine aggregate amounting to one-half of the volume of the coarse aggregate, and that 5½ cubic feet of concrete in place will contain 94 pounds of cement.

6. Mixing—The ingredients of the concrete shall be thoroughly mixed, sufficient water being added to obtain the desired consistency and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

Where a mechanical concrete mixer is used, the materials must be proportioned dry and then deposited in the mixer all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with the water, sand and cement.

7. Consistency—The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under heavy tamping.

8. Retempering—Retempering, that is, remixing with additional water, mortar or concrete that has partially hardened, will not be permitted.

9. Forms—The forms shall be smooth, free from warp, of sufficient strength to resist springing out of shape and of a depth to conform to the thickness of the proposed walk. All mortar and dirt shall be removed from forms that have been previously used. The forms shall be well-staked and set to the established lines, their upper edges conforming to the grade of the finished walk, which shall have sufficient fall from the lot line towards the curb line to provide for drainage, but shall not exceed ⅜-inch per foot. The base shall be blocked out in sections which shall not measure more than six feet in any dimension. The cross forms shall be of ¼-inch metal, of a depth to correspond to the thickness of the proposed walk, and shall extend full width of the walk and be set at right angles to the side forms. They shall be left in place until the wearing surface is floated.

10. Placing Concrete—The concrete shall be deposited in a layer on the sub-grade in such quantities that, after being thoroughly rammed in place, it will be of the required thickness, and the upper surface shall be true, uniform and parallel with the surface of the finished sidewalk.

In conveying the concrete from the place of mixing to the place of deposit, the operation must be conducted in such a manner that no mortar will be lost and the concrete must be so handled that the foundation will be of uniform composition throughout, showing no excess nor lack of mortar in any place.

11. Top or Wearing Surface—The top or wearing surface shall be composed of one part Portland cement and two parts fine aggregate, mixed with sufficient mortar to produce a mortar of a consistency which will not require tamping and which can be easily spread into position with a straight edge.

The mortar for the wearing surface shall be mixed in a mortar box and spread on the base immediately after mixing. In no case shall the wearing surface be placed after the base has set.

After the wearing surface has been worked to an approximately true place, the slab marking shall be made directly over the joint in the base. Such marking shall be made with a tool which will cut entirely through and completely separate the surface of adjacent slabs.

12. Edges—The slabs shall be rounded on all surface edges to a radius of about ½ inch.

13. Troweling—The surface shall be troweled smooth. The application of neat cement to the surface in order to hasten hardening is prohibited.

14. Protection—When completed the work shall be kept moist and protected from traffic and the elements for at least three days.

* * *

Necessary Precaution

"Prisoner at the bar," said the portly, pompous, and florid magistrate, "you are charged with stealing a pig, a very serious offense in this district. There has been a great deal of pig-stealing, and I shall make an example of you, or none of us will be safe."

* * *

Will It Come to This?

"Do you mean to tell me their church is crowded?"

"Yes. Why not? They pay ten thousand a year to their advertising man."

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Personal.

F. S. Forster, who has been with Architect B. G. MacDougall of San Francisco for the past four years, has formed a partnership with Frank C. Clark of Medford, Ore. Mr. Forster was well liked in San Francisco, and he and his bride have the well wishes of their many friends.

Architects MacDonald and Applegarth, who have designed many substantial and attractive buildings in San Francisco during the past four years, have opened a branch office in San Diego.

Arthur S. Bugbee is now associated with his father, Maxwell G. Bugbee, and the firm will be known as Bugbee & Bugbee, architects, 405-406 Wilson building, San Francisco.

Fresno Hotel Building.

Architect Edward T. Foulkes of San Francisco is completing the working drawings for a five-story and basement Class B hotel building which is to be erected in Fresno at a cost of over $225,000. The structure is designed in the Florentine style and will be constructed of reinforced concrete with the exterior walls faced with Medusa cement. The general plan of the ground floor contains two stores, a large lobby, an arcaded court with a beautiful fountain in its center. Opening off of the court will be found the grill rooms, dining rooms and reception room. On the mezzanine floor are the ladies' parlors overlooking the court. The court will be covered with an art glass dome. Drummers' sample rooms, a barber shop, billiard hall and bowling alleys will be located in the basement. The upper floors are arranged in suite and single rooms, totaling 175. Half of these will be equipped with a private bath. A fan system of ventilating will be installed with a special device in each room, assuring the guest a cool night's rest in the hottest of summer.

Redlands High School.

Architect Norman F. Marsh of Los Angeles has been commissioned by the school board of Redlands to prepare plans for the new polytechnic high school to be erected in that city and for which a bond issue for $85,000 was recently voted. Two buildings will be erected. The domestic science building will be a two-story and basement structure, 70 by 130 feet, and will contain departments for clay modeling, art and metal hammering, domestic science, sewing, millinery, a four-room flat which will illustrate a modern home, a hospital ward containing beds, kitchen and closets, and commercial department. The industrial building will be one-story, 100 by 160 feet, with forge and finishing room, four foundry and wood-cutting rooms and a drafting department on a mezzanine floor.

Phoenix Architects.

The architects and contractors of Phoenix, Ariz., held a love feast recently at which twenty-one members of the various trades and professions attended. Clinton Campbell was the toastmaster and spoke on the relations of the architect to the contractor. Architect Thornton Fitzhugh responded to the topic, "The Relation of the Architect to the Owner"; W. R. Norton, "Is Competition a Success?"; L. G. Knipe, "Is a Technical Education Necessary in an Architectural Way?" and J. M. Creighton, "The Future of Phoenix." Other speakers were A. B. Coates, John O'Malley and Hal Bennett, who discussed the relation between the lumberman and the owner and builder.

Big Department Store Building.

Architect Charles W. Dickey, who maintains offices in San Francisco and Sacramento, and who was formerly associated with Walter Reid in Oakland, has plans under way for a splendid department store building for H. C. Capwell, the well known Oakland dry goods merchant and banker. The building is to occupy the present site of the Hotel Touraine at Clay and Fourteenth streets, and will cover the entire lot, 130 by 207 feet. The structure will be Class A, four stories and basement, with steel frame, concrete walls and floors and exterior of white mat glazed terra cotta. There will be three passenger, one freight elevator and two automatic dumb waiters. All the conveniences to be found in the most up-to-date department stores will be embodied in the plans, including cafe, hospital, children's play room, roof garden women's rest rooms, etc. Work on the building is to be started January 1, 1911.

Mr. Dickey also has plans for two large buildings in Sacramento, one an apartment house and the other a hotel and office building.

Reid Bros. Design Library

The San Francisco public library trustees have plans for a municipal library, and a special election will probably be called in the near future to authorize a 5 per cent bond issue of $600,000 to add to the $123,497.28 now in the city treasury for building purposes.

It is proposed to erect the library in the center of the city's block bounded by Van Ness avenue and Hayes, Franklin and Fell streets. It will be of massive Graeco-Roman architecture. According to tentative plans by Reid Brothers, the building will be three stories and surmounted by a dome. The ground story will have the children's and newspaper rooms, storage rooms, lavatories, etc. The second floor will have a foyer, a main staircase hall, periodical, select library and reference reading rooms. The upper floor will contain study rooms, a music room and space for growth.

The stack rooms, which will extend in height the three stories, will afford space for 340,000 volumes.

Two Pretentious Hotels.

Architects MacDonald and Applegarth of San Francisco have plans for two pretentious hotels to be erected in the Bay City. One is for the regents of the University of California. It will be of reinforced concrete, eight stories high, and will contain 371 rooms. The estimated cost is $350,000. The other hotel will cost approximately $750,000, and is for the Nob Hill Company. It will occupy a commanding site overlooking the city at California and Jones streets, and will be Class A and ten stories high.

San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter, American Institute of Architects, was held at Bergez-Franks restaurant on Thursday evening, May 19th.

After dinner, the meeting was called to order by President William Mooser, the members present being Louis C. Mullgardt, vice-president; Sylvain Schnaittacher, secretary and treasurer; William Curlett, trustee; Oscar Haupt, Charles Paff, John D. Hatch, Louis Mastropasqua, James W. Reid, E. J. Vogel, Leo J. Devlin, Earl B. Scott, Wm. H. Crim, Jr., E. A. Coxhead, J. Cather Newsom, Wm. C. Hays, August G. Headman, Matt. O'Brien, Chas. P. Weeks, G. A. Lansburgh, John Galen Howard, Geo. B. McDougall, John Bakewell, Jr., Bernard J. Joseph, Louis S. Stone, Wm. L. Woollett, T. Patterson Ross and Clinton Day.

Messrs. Geo. C. Wales of Boston and Edward A. Crane of Philadelphia were present as guests of the Chapter.

The minutes of the regular quarterly meeting of April 21st, were read, and on motion of Mr. Bakewell, were corrected by the insertion of the names of the originators of important motions; and in this shape were then approved.

At the conclusion of the reading of the minutes of the previous meeting the president requested the suspension of the usual order of business so the Chapter might have the opportunity of some remarks from the visiting architects—Messrs. Wales and Crane. Both gentlemen favored the Chapter with expressions of their appreciation of the reception accorded them and extended the compliments of their home Chapters to the San Francisco Chapter.

Mr. James W. Reid, for the Committee on Entertainment and Reception, reported that his committee was making satisfactory and encouraging progress for the arrangement of the A. I. A. convention, to be held in San Francisco.

Mr. Bernard J. Joseph, for the Committee on Legislation, reported that the law of 1872 was in the hands of an attorney, and as soon as the committee received the draft of the same and had consulted with the Southern California Chapter's committee, the same would be printed and given to the members for consideration.

For the Building Laws Committee, Mr. E. J. Vogel had nothing to report, but complained that he had not been notified of proposed building laws under consideration by the Building Committee of the Board of Supervisors.

Mr. L. C. Mullgardt, for the Committee on the Revision of the Constitution and By-Laws, reported that a draft of the revised Constitution and By-Laws was in the hands of the printer.

The secretary reported that the absence of Mr. T. J. Welsh was due to illness, and that there was nothing to report from the Committee on Publicity.

Mr. Wm. Mooser, as chairman of the Panama-Pacific International Exposition Committee, reported that up to date he had subscriptions to the stock of the Exposition Company to the amount of $18,600.

Mr. B. J. Joseph, one of the Chapter's delegates to the San Francisco Housing Association, reported having attended a meeting of the Housing Association; also progress in the work of the Association.

Communications were received and ordered placed on file from the Associated Roofers, regarding the building law requiring the asbestos sheet in roof covering; from Alfred A. Goldschmidt, regarding architectural books; from Chas. E. Hodges in regard to non-certificated architects practicing in San Francisco; from Henry A. Schulze, advising the Chapter of his pleasure in representing it at the convention of the American Federation of Art; also that the San Francisco Chapter led all other Chapters, excepting Chicago, in the amount subscribed to the McKim Memorial Fund, and would have led it also had it not been for an individual subscription in that city of $5,000; and from Maurice Levy, in regard to securing a position as draughtsman.

The letter from the Associated Roofers was referred to the Building Laws Committee of the Chapter for consideration. The communication from Mr. Chas. E. Hodges was referred to the State Board of Architecture.

Mr. Chas. T. Mott, a Fellow of the A. I. A. and a member of the Brooklyn Chapter, having made the necessary application and there being no objection, was declared a member of the San Francisco Chapter.

Mr. Oswald Speir, having made application for associate membership and there being no objection, was declared elected an associate member of the Chapter.

Messrs. Ehrenpfort, Farr, Jacobs and Kelham were unanimously elected to membership.

The following resolution was proposed by Mr. Howard, duly seconded and unanimously carried:

"The San Francisco Chapter, A. I. A., desires to express its hearty congratulations to its fellow member, Clinton Day, L. L. D., on the occasion of the distinguished honor conferred upon him by the University of California during the celebration of the institution's fiftieth anniversary." Mr. Day gracefully expressed his appreciation of the adoption of the resolution by the Chapter.

Los Angeles Chapter, A. I. A.

The regular monthly meeting of the Southern California Chapter of the American Institute of Architects was held early in May in Levy's cafe. about thirty members attending. President Frank D. Hudson presided. New members were announced as follows: Henry Lord Gay, San Diego, a fellow of the Institute; Irving J. Gill, San Diego.

The resolution raising the initiation fees was adopted. These fees are now $25 for regular membership and $10 for junior membership.

Following the usual dinner various legislative measures were discussed. Mr. J. J. Backus, chief inspector of buildings of Los Angeles, outlined the position of the building department in regard to the Burnett tenement act.

Mr. J. A. McLeod, an architect of St. Paul, Minn., was a visitor and gave an account of the experience of his chapter in working for a state law in Minnesota for the licensing of architects.

Builders' Exchange Election.

The annual election of officers of the Los Angeles Builders' Exchange was held in May, with the following result: W. S. Daubenspeck, president; P. J. Bolin, first vice-president; J. A. Watt, second vice-president; C. V. Fowler, third vice-president, and D. M. Leary, treasurer. The directors to fill the five expired terms are W. E. Thornton, J. A. Crook, J. S. Merrill, John Griffin, J. H. Bean. J. R. Kline is secretary.

Plans for Oakland Bank.

Among the architects who are preparing competitive designs for the ten or twelve-story Class A bank and office building for the Security Bank and Trust Company of Oakland are Meyer & Reid. McCall & Wythe, Charles Peter Weeks, Newsom & Frary and Henry Meyers. The estimated cost of the building is $200,000. Work on the structure will not be started before January 1, 1911.

Change of Partnership.

The architectural firm of Hunt, Eager & Burns, of Los Angeles, has dissolved partnership, Messrs. Hunt and Burns remaining together, and Mr. Eager taking his brother with him. The present offices in the Laughlin building will be maintained by both firms until Eager & Eager have their offices completed in the Story building.

High School Competition.

Architects Cumming and Weymouth of Oakland have had their plans accepted in a competition for a one-story and basement high school building at Antioch. The building will cost about $16,000.

New Architects.

Certificates to practice architecture have been issued by the state board to the following: Frank Kegley, Blanchard building; Robert Halley, Jr., San Diego; G. A. Hansen, San Diego; A. D. Sturgis, Long Beach, and O. M. Warner, Los Angeles.

Structural Defects in City Schools.

Structural defects have been discovered in four of the public schools by a special commission appointed by the San Francisco board of works. The schools found lacking in the required elements of safety were the Mission grammar, the Bryant, the McKinley and the Clement. These buildings were erected under the last administration out of the special bond issue. The board of works already has made the necessary alterations in the Bryant and Clement, and at once will authorize changes in the McKinley and Mission schools.

The examination of all the new school buildings was made by J. D. Galloway, Matthew O'Brien and Henry A. Campbell. They found the great percentage of the schools structurally sound, but noted deficiencies as follows:

"Mission Grammar—Three of the trusses are of poor design and very costly. Chimney dangerous. Yard sheds poorly designed.

"Bryant—Steel columns and girders recommended to render building safe. Chimney dangerous.

"McKinley — Trusses over windows carrying floors only 15 per cent in required strength in rods. Chimney dangerous.

"Clement—We find that the reinforced concrete girders of the first floor running to the center portion of the building and the similar girders of the basement floor over the sub-basement are entirely too light, having but 39 per cent of the required strength. Columns also supporting these girders deficient in strength. Trusses carrying second floor joists over windows have but small fraction of strength necessary to carry load. Chimney dangerous.

Under the head of "General Comment," the report says:

"We note that throughout the schools not enough attention was paid to the structural designs. A case in point was the Mission grammar school, where a considerable saving could have been made to the city in the steel frame, most of which is far heavier than the most rigid assumption would warrant. It is deficient in bracing, which we consider essential."

Personal

J. Cather Newsom has formed a partnership with I. E. Frary, with offices at 319 Central Bank building, Oakland. Mr. Frary has been practicing architecture in Chicago and has brought with him the most modern ideas relating to architecture, The new firm will open a San Francisco office shortly.

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EXPERIMENTS IN ARCHITECTURE

In a recent lecture before the Royal Institute of British Architects, Professor Lethaby of London opened a new line in architectural thought when he argued that all architectural development is the outcome of a series of experiments conducted by a large number of men over a considerable period, the men all working in harmony with one another and with the spirit of their country and the time.

Professor Lethaby took examples from all times, from among the Greeks, the Romans, the Byzantines, the great Gothic workers of the Middle Ages, and the revivalists of the Renaissance period, in Italy, France, and England. Most of the architects he mentioned were also mechanical or military engineers, or both; many of them were geometricians of note; others were mathematicians, and even astronomers and aviators. In many cases men possessed of these high scientific attainments, as they would be reckoned in their days, not only followed the art of architecture, but the arts of sculpture and painting also. The greatest men were men of many parts.

But the real lesson which Professor Lethaby drew was that architectural development was a natural outcome of a deep insight into scientific construction; that the great buildings were not erected merely because their designers were inspired artists, but because they applied their artistic capabilities to the production of beautiful forms on scientific lines; that the science of construction was the necessary basis out of which all the rest grew. He laid particular stress upon the fact that Gothic architecture was an architecture of scientific construction almost entirely; of poise and counterpoise, thrusts and their resistance; that it developed by each daring experiment being made in advance of a previous one little less daring but successful. He showed that the whole idea of domical construction had a scientific basis, and that here again fresh experiment succeeded each successful experiment, the steps being slow and many before the final great achievements were accomplished.

Having thus historically substantiated this position, Professor Lethaby went on to explain that the architectural education of the future should have a sound scientific basis. It appears that what Professor Hamlin said in England a few months ago about the highly scientific basis of architectural training in America has led to much deep thought upon the part of the educational leaders in London, and that they have come to recognize that there is a great deal to be said for the method in which we Americans are proceeding. This is undoubtedly a scientific age. The greatest structural works of the last fifty years have not been architectural, but of a purely engineering character. If architecture is to take advantage of modern science, if it is to develop along new and sound lines, it is essential that the architects should themselves be scientists, or, at any rate, that they should understand the science of the construction which they use.

OWNER TO BLAME FOR MANY "EXTRAS"

In answer to a query propounded by a citizen through a newspaper in Boston an architect attempts to answer the question "Why is it that contractors' bids on a building almost always exceed the architects' estimate of its cost," as follows: "My experience is that almost invariably the owner comes to the architect's office filled up with ideas that he can build for much less than the cost of construction. Oftentimes he will go to a first-class architect, who will be honest with him and tell him what his building is going to cost, which of course will not satisfy him as the cost will be above his ideas. Then he will begin to hunt for someone who will tell him his building will cost what his idea is. As a result he gets hold of an unscrupulous architect, or one who is not experienced, and does not know the cost of construction, and starts on the plans. As the plans progress different things present themselves to the mind of the owner and he has them incorporated in his building, which, though seemingly small, individually, will swell materially the total cost of construction in the end."

The real trouble seems to be the anomalous position taken by many architects. They are apt in the first stages of the consultation to allow the owner to dictate. We do not believe there are nearly as many "unscrupulous" architects as careless or thoughtless ones. The owner always wants his building started the day after he has bought his lot and decided to build. The result is that there are few buildings that receive sufficient preliminary study. The architect is careless of his reputation and thoughtless of the results when he allows the owner to dictate when the drawings will be ready for figures. When an owner insists on a shorter time than the architect considers reasonable he should be notified in writing that the architect waives all responsibility in regard to correctness of the plans, at least as far as extras are concerned. It seems as though the owner would then feel that the responsibility for haste was on him instead of the architect.

Book for the Homeseeker.

The Southern Pacific passenger traffic department has recently published an attractive book intended for the information of the homeseeker and California settler. The book is not a compilation. Sources of information have been drawn upon freely, but the book represents the observations and convictions of thirty-five years of continuous residence in California, and of close personal contact with the chief centers of the state, both north and south.

Nor is the book a bit of "boom" literature. It indicates clearly the great advantages which this Pacific Coast state offers settlers, but keeps in mind at all times the man who "wants to know," and who, turning hopefully to California to find a permanent home, cannot afford to be misled. The aim of the book would seem to be to present California as it is today, with no other object than to subserve at once the interests of the state and the needs of the homeseeker.

A copy of the book may be had free upon application.

HEATING AND LIGHTING

Cleanliness in Ventilation.

By Ralph C. Taggart,* in Heating and Ventilating Magazine.

THERE is one point in the design of ventilating apparatus which is too often overlooked. This is the cleanliness of the apparatus. Where air-cleaning washers or filters are used they will require attention. Many of these appliances, if not properly looked after, become themselves most foul. Whether or not the apparatus has an air washer or an air filter, it should itself be arranged so that all air passages can be kept clean.

Horizontal air flues and ducts which are not themselves cleaned out become in many cases real dirt collectors. How often have we looked at the basement plans of a ventilating equipment in which the flues seemed most to resemble the intertwinings of many serpents. These flues often cannot be cleaned and, even where clean-out doors are provided, the ducts usually are not cleaned out on account of the labor involved.

How many owners and occupants of buildings know what they have in their basements? I can hardly blame a society lady of New York City for her fixed determination not to have any air from the basement brought to the rooms of her new house. She did not mean basement air, but air from out-of-doors carried through the basement. At first her point of view may seem foolish, and probably she had the idea that more or less of the air must come from the basement. But where we know the condition of the insides of the basement flues and ducts of many heating plants, it is a question whether we might not at times prefer air taken directly from the basement.

We assume so readily that the insides of the flues and ducts of the ventilating apparatus must be clean. We have a right to assume that smooth vertical flues will not retain much dust, but in the case of horizontal ducts and flues the condition may be very different.

Where air is brought from out-of-doors and heated by indirect heaters, the air is usually carried to the heaters through ducts or flues. It is much better to bring the air directly into chambers or rooms in which the indirect heaters are located. These rooms will then become cold air settling chambers. This arrangement leaves the bottoms of the indirect heaters entirely open, so that all that is required, in the way of hoods or casing, is a hood directly above the indirect heater, with a short connection to the vertical flue. The indirect heater should, of course, be placed near the vertical flue, so that the connection from the hood will be a minimum. A large door into the hood

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should be provided and placed so as to be readily opened. It is essential to have a cold air, as well as a warm air, connection to each vertical air supply flue when the rooms require ventilation. This cold air connection allows a mixture of cold and warm air to pass to the rooms in moderate weather, when a mixture is required, in order to lessen the temperature without lessening the quantity of the air.

The bottom inlet of the vertical air supply flue is the place to which dirt in the vertical flue will fall and, as this inlet may be left entirely open, the dirt is readily seen and may be easily cleaned out. These cold air chambers should be rooms from which dirt may be easily removed. They should be finished smoothly on the inside. They should not be rough unfinished spaces, from which the complete removal of dust by sweeping is practically impossible.

In the case of vent flues the lower outlet may be an open enameled outlet box. Any dust in a vertical vent flue will fall to this open vent box, when it can be easily seen and readily removed. When fans are used it is essential to arrange all horizontal air passages so that they can be cleaned out with the greatest ease.

There is a method, developed by Mr. William J. Baldwin, of running tempered air ducts in the basements of buildings, which has many advantages. The general scheme is to make the air duct a passage-way through which a man can walk, and which can be easily kept clean. The intention is to run only vertical flues from this duct. In some buildings this duct has been placed next to the outside basement wall. If the basements are of fair height, the ducts may be carried up only to the bottoms of the basement windows, so as not to interfere with the general lighting of the basement. It is, of course, possible to arrange the ducts so that light from the basement windows will pass to the basement proper by glazing the sides of the ducts. In some cases it may be desirable to place these air passages away from the outside building walls and parallel to interior walls. The walls on the upper floors, directly above these basement walls, may then contain the vertical flues and become what are called the "breathing walls." In many buildings these breathing walls can best be located at the sides of corridors.

At those points within the basement, where it is necessary to arrange passageways, through what would naturally be the duct space, the duct itself may be carried above or, if absolutely necessary, below the doorways. In all cases these passages above or below doors should be made large, so as to be easily accessible and readily cleaned out.

Ducts made in the manner described should not be made of galvanized iron. They can be made of plastered partitions with concrete floors, similar to interior corridors, or they may be made with a smooth enamel brick or tile lining, which can, if desired, be washed out with a hose or otherwise easily cleaned.

The flues to the various rooms will then become only vertical air pasages, from which dust and dirt must fall to the air passages in the basement, where it can be easily removed. In a building of permanent construction it may be desirable to line the vertical flues with a smooth enamel lining, and the outlets in the various rooms may even at times be formed with enamel brick with rounded corners without the use of registers.

Hospital Plumbing

HOSPITAL plumbing stands in a class by itself, and there is, perhaps, no other kind of building in which good plumbing work, materials and fixtures are of so much importance, particularly in that part of the installation which has to do with surgical cases and the preparation for operations. There are four divisions of the plumbing in hospitals—that which is installed for the general welfare of the patients, the fixtures and apparatus required for the institution as a whole, provision for the doctors and nurses, and apparatus and fixtures used in the curing of diseases and performing of operations.

In all large hospitals the patients may be roughly grouped as private cases, ward patients and children. The private patients are quartered in private rooms, the same as in a hotel building, and bathrooms should be provided adjoining these private rooms in the same manner as in hotels and club buildings.

In private rooms which are not connected with a bathroom stationary lavatories, at least, should be provided.

For the accommodation of ward patients general toilet rooms, also bathing facilities, are provided convenient to the wards, and in the receiving ward showers which can be operated by an attendant from a distance are very desirable, particularly where charity patients are received, so that when necessary the incoming patient can be thoroughly scrubbed before being assigned to quarters in the hospital.

For the children's ward a bathroom can be fitted up in which infants' and children's baths are installed. Likewise in the toilet room children's closets, which are only about thirteen inches high, may be specified instead of the standard size of closets.

For the institution in general a kitchen and diet kitchen, a laundry, water-heating apparatus, fire lines, helps' toilet and bathing accommodations, engineers' toilet room and sundry other sanitary provisions will be necessary. In like manner toilet and bathing facilities will be necessary for the doctors and nurses.

All of the foregoing enumerated sanitary requirements are common to all institutions of this character and differ but little in the various hospitals. When, however, the matter of sanitary appliances for use in the surgical wing of the building is to be considered it will be well to go over the matter thoroughly with the surgeon having charge of that branch of the hospital work. Before doing so the designer should familiarize himself with the various fixtures and appliances designed for hospital service and the advantages and limitations of each when they have been installed.

Portable bathtubs on wheels, some of them fitted with frames for the immersion of typhoid fever and sunstroke patients, are among the plumbing fixtures

which will be required, and a sink or other receptor, set with the top level with the floor, will be found necessary for drawing off the waste water from the tubs. Further, hot and cold water faucets, with long swing spouts set over the sink, will be required for filling the tubs.

Slop sinks will be required at suitable places to facilitate the cleaning of wards, rooms and corridors, and floor drains will be found necessary in some places—as, for instance, the operating rooms, autopsy rooms and morgue. A battery of lavatories fitted with knee action or pedal arrangements for turning on or shutting off water and operating the waste plug will be found desirable in the doctors' washroom, where they clean their hands before and after operations.

Hospital sinks will be required in the examining rooms, operating rooms, morgue, wards, toilet rooms, sterilizing rooms and, possibly, at other points, while hospital lavatories with knee action or pedal operated cocks will be found desirable in the operating, sterilizing and anesthizing rooms. At some of the fixtures in the operating, sterilizing and other rooms connected with the operating room, sterilized water will be required, and special water distilling apparatus will be necessary for this purpose, together with the pipes leading to the fixtures. Sterilizing apparatus will likewise be required and will be located, no doubt, in a special room set aside for sterilizing purposes. In this room, in addition to lavatories and a sink, large, deep vats or tubs, similar to sinks but much deeper and provided with plugs, will be necessary for holding antiseptic fluids. A portable immersion tub of this description set upon a framework with wheels will be found convenient for moving from place to place—as, for instance, into an operating room—so that basins and other utensils used during an operation can be immersed from time to time in the antiseptic solution.

In the laboratory considerable plumbing will likewise be required, the kind and amount depending largely upon the size and completeness of the laboratory equipment. Autopsy tables with waste connections in the autopsy room, and mortuary slabs in the morgue, will also be required, and sinks will be convenient in most of the rooms referred to in the surgical quarter.

In addition to all of the fixtures and apparatus enumerated in the foregoing paragraphs a complete Turkish bath will be found of value in all large hospitals, while apparatus for hydrotherapeutic treatment of patients will be found necessary in some hospitals and sanitariums.—Exchange.

To Exhibit State Building Products.

To awaken architects and builders to the advantages of using California materials in construction work, a display of natural California building products is being arranged for exhibit in the state mining bureau, Ferry building, San Francisco, by State Mineralogist Lewis A. Aubury.

As soon as this is completed a campaign of education along these lines will be started by Dr. C. T. Deans, A. H. Ward and W. J. Bartlett, trustees of the bureau. The state will be traversed to secure additions to the collection.

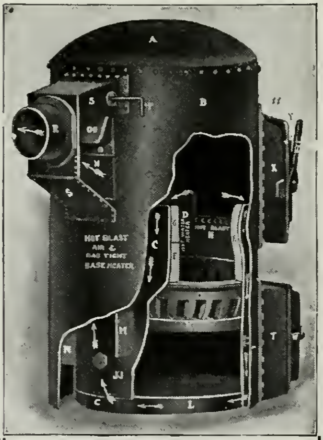
It has been said that California architects and contractors are not alive to the high quality and great variety of state products.

Aubury says that in the construction of public buildings in this state stone is often imported from other states, and even from foreign countries, when a stone of an equal worth can be obtained in California. The exhibit and campaign are designed to correct this popular error.

California is rich in the quantity and the quality of granite, sandstone, limestone, slate, marble, onyx, pumice stone, gypsum, cement and infusorial earths, and these materials can be produced at a cost much less than they can be imported from the East.

For some time past, the state mineralogist has been endeavoring to convince the treasury department at Washington that California's natural products are being discriminated against by the government architects.

In the Los Angeles postoffice building Wyoming sandstone was specified, and the state mineralogist demonstrated



that a superior quality of California sandstone could be substituted, with a saving of $10,000 of the proposed cost. The government engineers were convinced, and the United States saved that amount of money and a California industry profited.

The state mineralogist intends to arrange a "Get-together" meeting of the architects, builders, contractors and building material dealers, in order that the different allied interests may be brought into touch with the requirements of the case, and work in harmony. It is Mr. Aubury's opinion that the person who is most responsible for the existing state of affairs is the owner, the man who puts up the capital.

The Convention League

The League announces convention dates for San Francisco this summer and fall as follows:

June 20-25—Pacific Coast Advertising Men's Association.

September 5-9—Delta Upsilon Convention.

September 7-9—Concatenated Order of Hoo-Hoo.

September 8-10—Native Sons and Daughters.

October 3—Opening reception Spiritualist Convention.

October 4-11—Druids.

October 17-21—National Spiritualist Association.

Date not set—National Institute of Architects.

Negotiations are in progress looking to favorable action for San Francisco in 1911 by a number of large assemblages. Two of these, the National Educational Association and the National Grocers' Association, are almost certain to come.

Every convention meeting in the United States this summer will be attended by delegations from San Francisco, backed by influence and money of the League to make a campaign for San Francisco.

Ransome Company in New Quarters.

The Ransome Concrete Company has moved from the Crocker building to new offices in the Mechanics' Institute building at 57 Post street, San Francisco. A handsome suite has been taken on the sixth floor. It is much more conveniently arranged than the old offices, having a private hall from which the several offices of the company may be reached. The rooms are finished in weathered oak and have large plate-glass windows which afford good light and excellent ventilation.

Will Enlarge Pullman Plant.

Superintendent of Construction H. A Joslyn of the Pullman Company has received instructions from the Chicago headquarters to make the Richmond plant three-sevenths larger than it was at first intended. The company had arranged to erect four buildings, but has decided to increase that number to seven. This means that the capacity of the plant will be almost doubled and a much larger number of men employed than was planned in the beginning. The size of the buildings now under construction is from 200 by 350 to 400 feet in ground area. They are all three stories in height, built of reinforced concrete and pressed brick. In order to resist possible earthquake shocks, a system of steel braces has been installed, making the buildings unusually strong.

By the Way

Some Industrial Information Worth the While

The Latest for Natural Wood Finish Ornamentation.

Architects who are careful in their ornamental treatment of interior natural wood finish, will doubtless be glad to have the latest catalogue of the Decorators' Supply Company, copies of which may be had free of charge on application to the San Francisco sales agents, the Western Builders' Supply Company, 680 Mission street. The catalogue contains a list of over 5,000 ornaments, including miscellaneous composition carvings, leaves, scrolls, festoons, mouldings of all kinds, bands and friezes, and an especially large assortment of wall panels for tapestry. These wall panels are fitted with a special tapestry strip combination, which makes it easy to apply silk or any other material.

Architects should not confuse this material with miscellaneous collections of ornaments, as each size and design is carefully modeled and executed in the finest detail of the order to which it belongs. The work finishes natural to match the grain and color of any wood, including redwood, mahogany, oak, pine, etc.

The principal difficulty in the use of compo to match wood has been that any hard substance was passed off on the architect as "compo." Such material generally cracks, checks, or warps, and usually does not have the grain of the wood, but looks like a piece of china ware when finished. The compo in question has none of these defects, and is used with confidence on the finest work in San Francisco and elsewhere. It is the result of many years of practical experience by thoroughly capable architects, designers and chemists.

This catalogue is furnished only to registered architects by the Western Builders' Supply Company, who also carry the largest stock of capitals and brackets, and turned, pressed and art mouldings on the Coast.

Moves to New Offices.

The H. D. Samuel Company has outgrown its quarters on Valencia street, San Francisco, and has moved to larger and more central offices in the Monadnock building. The company's yards are at Thirteenth and Mission streets.

SOUTHERN PACIFIC COMPANY'S POWER HOUSE, OAKLAND
D. J. Patterson, Architect

Send for the Humphrey Booklet.

"The Cheapest Hot Water in the World," is the name of a readable and attractively printed booklet just published by the Humphrey Company of Kalamazoo. Of the several interesting things to be found in the book, the following is an example:

"The cheapest hot water in the world is heated by the Humphrey instantaneous bath water heaters. Every one would like to have in his home an inexhaustible supply of hot water ready at any minute. The object of this booklet is to show that we have within easy reach of every home, simple or elaborate, a device that will answer this wish to your perfect satisfaction.

"It is the Humphrey water heater. There are two kinds—both instantaneous—the Humphrey bath water heater and the Humphrey automatic water heater. Both burn gas. The bath heater is best for one bathroom, or similar use. The automatic is best to supply several faucets, bath tubs, laundry tubs and sinks."

Magazine Wanted.

Mr. George Kroonen of Corona, Cal., would like a copy of the September, 1909, issue of the Architect and Engineer to complete his files. Twenty-five cents will be paid for this issue.

The Mission Bank Decorations.

San Francisco has passed through the "Rush" stage, incident to the period following the great fire, and has gotten down to a sane level. The property owner has recovered his equilibrium, and is willing to listen to the advice of the architect, and to acknowledge that it is worth while to put character into a building by arranging for decorative effects which will beautify the building and be a source of pride to all concerned in the work.

The new bank building, now being finished at Valencia and Sixteenth streets, is typical of the new era of construction. The architects, Messrs. Crim & Scott, have designed a building which is the finest in the Mission district, and an ornament to the city. The decorations are exceptionally fine, the work as done furnishing conclusive proof that the decorator, Frank Griffin, is thoroughly in touch with the designer. The vestibule, on the Sixteenth street side, is decorated in three tints, relieved, or "touched up" with gold leaf. The banking room is finished in the same general style, and makes a very showy appearance. The apartments on the second and third floors are finished in dull tints, the living rooms having a landscape border.

The architects and the bank directors unite in saying that the decorative work is eminently satisfactory.

The Hipolito Screen.

It may not be generally known that California is producing window screens and screen doors equal to any manufactured in the East. Unless the entire window is covered, the patent sliding window screen seems to give most satisfaction, as they keep insects out, are always in place when wanted, never get out of order, and look well.

Special attention is called to the "even tension" method of fastening the wire, also the coped corners cabinet made with spiral dowel, making the strongest possible construction.

It costs very little more to use genuine bronze wire, which is practically everlasting; it never rusts, not even when exposed to salt spray or fog.

The trouble with poor screens is they either sag, are full of holes, or do not fit. The "Hipolito" does not have these faults, and serves the purpose for which it is built; viz., to keep flies, mosquitoes and other insects out all the time.

The Western Builders' Supply Company of 680 Mission street, San Francisco, are agents for the Hipolito screen, which is manufactured by the Hipolito Screen and Sash Company of Los Angeles.

Meurer Bros. on the Coast.

Meurer Bros.' Company of Brooklyn, N. Y., manufacturers of the well known galvanized iron Spanish tile, report a steady increase in their Pacific Coast business which speaks well for the company's goods. J. H. McDonald, the Coast manager, has recovered from a severe attack of illness, and his friends are pleased to see him back in the harness again. During the latter part of Mr. McDonald's illness the San Francisco office was in charge of A. W. Newbould, who was sent out here from the home office. Mr. Newbould was accompanied by Mrs. Newbould, and they made their headquarters at the Peninsula Hotel at San Mateo. Mr. Newbould made many friends and secured quite a little new business for his company during his brief stay in San Francisco.

Build Oakland Homes.

Sturgeon & White of 904 San Pablo avenue, Oakland, have been very successful in building moderate priced homes. A number of attractive bungalows have lately been finished by this firm, and the owners are said to be very well pleased. A handsome bungalow has been completed for Mr. J. J. Flynn on Piedmont avenue, at a cost of $3,500. It contains five rooms and bath and a kitchenette. The interior finish is Oregon pine, with oak floors and tiled bathroom, paneled and beamed dining room and bed chambers papered with pictorial frieze. The house also has a large open fireplace, gas and electric fixtures and other conveniences.

The Locke Foundation Company.

The Locke Foundation Company, with offices in the Crocker building, has secured a contract for the foundation work on the new Banker's hotel in Oakland, Bliss & Faville, architects. The foundations will be of concrete, and the contract is one of the largest of the kind let this year. Work is already well under way. The Locke Company is composed of men thoroughly experienced in concrete construction, and contracts are taken for general concrete and cement work, besides foundations. A. C. F. Locke, M. E. and R. J. Wood, C. E., are the active members of the firm.

Occidental Hotel Building.

Plans for the immediate erection of a magnificent hotel building upon the site of the old Occidental hotel, Montgomery street, between Bush and Sutter streets, San Francisco, are reported to have been consummated. H. H. Taylor, manager of the Mills properties, interviewed Ogden Mills during the latter's visit to San Francisco relative to the Occidental hotel property, and the plans for rebuilding the hostelry. While unwilling in the absence of Mr. Mills to discuss the plans, Taylor would not deny that the hotel was to be erected with the assistance of Mills. Bliss & Faville are the architects.

Pittsburg Water Heaters.

Joseph Thieben, who, with J. G. Scott, has done much to create a popular demand for the Pittsburg water heater, has recently enjoyed an extensive trip north and east, combining business with pleasure. According to a representative of the company the business of the Pittsburg Water Heater Company shows an increase of over 150 per cent over the volume of business for the year 1908-09. This success, the company declares, is due to the mechanical and efficient superiority of the various water heating appliances it manufactures, with a selling organization throughout the United States that believes in the merit of its goods and leaves no stone unturned to make every heater work to its fullest capacity and the entire satisfaction of the purchaser.

Jos. Thieben and J. G. Scott, comprising the firm of Jos. Thieben & Co., with office and display rooms at 667 Mission street, feel proud of the fact that over 1,000 Pittsburg heaters have been installed in San Francisco and the surrounding cities, "every user being a delighted user, which speaks volumes for our well merited success."

Contractor Peterson Busy.

Contractor H. L. Peterson of 62 Post street, San Francisco, is engaged in erecting several buildings according to the Pelton system, which was described in this magazine several months ago, and which provides for a complete steel frame with concrete walls and floors for large and small buildings, residences, as well as flats and business structures. The buildings already erected according to this new system are reported to be entirely satisfactory. Mr. Peterson has recently completed a two-story flat building for Edward Grundy, and he has the work well under way for a three story brick and concrete building for Dr. H. L. Wagner, on Sutter street, San Francisco, from plans by Architect Albert Farr.

White Brothers' Herculean Task.

Three million feet of hardwood is a large quantity to move, and it would seem almost a superhuman task to transfer this quantity from Spear and Howard to Fifth and Brannan streets, San Francisco, and have the job completed by July 1. This, however, is what White Brothers are attempting. All day long lines of teams are to be seen leaving the old location loaded with hardwood.

The new yards at Fifth and Brannan streets are rapidly assuming the appearance of a lumber yard, and a busy one at that, while the old location at Spear and Howard streets is taking on an air of emptiness, and the activity which characterized this location for the last twenty-three years is slackening.

Should Rid City of Irresponsible Contractors.

Among the successful San Francisco contractors, A. Lynch, a prominent member of the Builders' exchange with offices in that organization's building, is probably as well known as any of his competitors. Mr. Lynch is one of the few good concrete specialists in San Francisco today who will not take a contract unless there is something to be made out of it. The fact that he has figured on more than 100 jobs since the first of the year and has "landed" only five or six is proof enough that he has no use for a job if there is insufficient money in it to do the work right and at a reasonable profit.

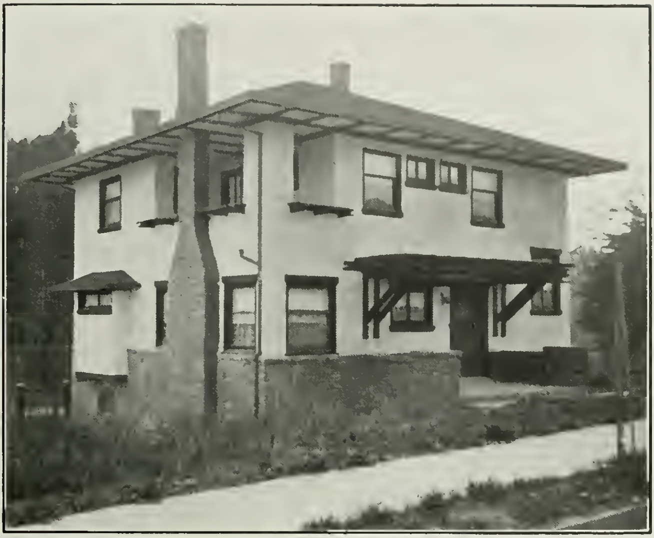
"Contractors who take work at ridiculously low figures must either 'skin' the job or lose money," is the way Mr. Lynch looks at it, and recent events would seem to bear him out. A number of irresponsible contractors have gone to the wall, and there are a few left that will meet the same fate unless they change their tactics. "If they don't 'skin' the job they must owe somebody for their materials, and if they don't run into debt they will go broke unless they have a millionaire's bank roll," is the way more than one reputable contractor, in the same class as Mr. Lynch, has sized up the situation.

Products or Dividends.

Keuffel & Esser Co., 48 Second street, San Francisco, are selling a book that should appeal to engineers. Its title is "Products or Dividends," by George A. Christensen, C. E., of San Francisco. The book calculates without mental gymnastics, and better than any machine. Concrete Engineering says of it: "A small book, compactly arranged, containing tables of products or dividends, so logically classified by decimal ordinates, as it were, as to be easily found and referred to their factors. This, in short, is what this book seems to be. It is a radical development in a new line and at first thought seems startling, but the book is before us, and to multiply any two numbers is but a minute's work and the results are accurate. Original letters of endorsement from engineers who have tried this book and found it of great use, came with it."

McCormick Back in San Francisco.

E. O. McCormick has returned to San Francisco to enter upon his new duties as vice-president in charge of traffic for the Southern Pacific lines in the sweep of territory included in Oregon, California, Utah, Nevada, Arizona and New Mexico. He occupies a handsome suite of offices on the seventh floor of the Flood building.



An Oakland Home Finished in Medusa Cement and Monterey White Sand
A. W. Smith, Architect

Pure White Sand for a High-Class Cement Finish

PACIFIC Coast architects have experienced considerable difficulty in finding a clean white sand which, when mixed with white Portland cement, will give a pure white plaster finish. Residence work, especially, requires a fine mixture and where Medusa cement is used for an exterior surface on reinforced concrete buildings, it has, until lately, been a problem to find a sand that would fill all requirements. It has, however, been fully demonstrated that the "Del Monte White Sand" is the ideal sand for this purpose. This has been on the market for many years under the name of Lake Majella or Monterey White Sand. The Pacific Improvement Company has been calling the attention of architects and builders to its excellence as a white finishing sand, and recently changed the name to "Del Monte White Sand." Nearly everybody has heard of Del Monte, and it is within close range of this world-famous hostelry that the sand is gathered and shipped to any point on the coast.

The fact that it gives the requisite even and white finish and "stays white," has been a potent factor in influencing architects to use it and specify it in their choice concrete and plaster work.

Among the architects whose experiments with Del Monte white sand have been most satisfactory is A. W. Smith of Oakland, who has used it with both Medusa and La Farge cements for residence work. One of the Smith houses having this treatment is illustrated here. The house is the property of a Mr. Dennis, and is situated on Santa Ray avenue, near Viona street, Oakland. It is a frame structure of rather attractive appearance, having an exterior treatment of cement plaster on metal lath. Mr. Smith says that when he specifies Del Monte White Sand he is certain of a good mix. It has the advantage of other sands in that the concrete does not change color, and consequently does not require painting. As dust only adheres to painted surfaces, the cement naturally retains its clean and fresh appearance.

Del Monte White Sand is handled by all reliable dealers in building materials as far north as Seattle. Samples, prices and a list of dealers will be furnished upon request. The offices of the Pacific Improvement Company are in the Crocker building, San Francisco.

An Index to the Advertisements

[Index Continued on Page 120]

Imperial Waterproofing.

A. F. George Company of Los Angeles has perfected a waterproofing preparation for concrete which has successfully stood some severe practical tests. A letter recently written to the manufacturing company by the board of supervisors of Los Angeles county shows the results of one of these tests.

Los Angeles, March 21, 1910.

It gives us pleasure to make a statement concerning the efficiency of Imperial waterproofing.

When you offered to stop the flow of water coming into the courthouse elevator tunnel, running from New High street to the courthouse elevator, we looked upon your proposition as a huge joke, as the water was flowing like springs in a great many places all over the roof of the tunnel, but today there is not a particle of water flowing into the tunnel, or any indications of water whatever; besides, you have improved the appearance of our tunnel 100 per cent, and the small amount of expenditure we have made in applying the waterproofing is very much appreciated by the public.

Imperial waterproofing is certainly a wonder, and if it is permanent, as you claim, it is certainly one of the most valuable commodities on the market.

Signed by C. D. Manning, H. D. McCabe, S. T. Eldridge, C. J. Nellis, R. W. Pridham, board of supervisors, Los Angeles county, California.

Imperial waterproofing can be applied on the surfaces with a brush or mixed in with the concrete. It will not discolor the materials on which it is used, but can be colored, if desired, by the use of indelible dyes. It is very penetrative and combines with the material, so that it will not crack or peel.

Asbestos Protected Metal

Asbestos protected metal for siding and roofing is finding many warm advocates on the Pacific Coast, according to P. J. Knudsen, the San Francisco agent.

Among some of the larger jobs covered with these sheets in the Middle West are the foundry for the Phoenix Manufacturing Company, Eau Claire, Wis.; gas plant at Aberdeen, S. D.; Palmilla Milling Company power house, Parral, Mexico, and the Butte Electric Company power station, Butte, Mont., for all of which jobs they are also furnishing the steel work. Asbestos sheets are also used for covering the merchandise warehouse at Duluth and Superior for the Soo Line, power house roof for the Carter White Lead Company, Omaha, as well as orders from the Denver Gas Company, Anaconda Copper Company, and Centerville (Ia.) Light and Traction Company.

While it is only within the last year that this material has been used to any extent in the Northwest, it has had a large sale in the eastern and central states for a number of years, largely to gas works, chemical works, foundries, smelters, railroads, etc., where the sulphurous fumes and extreme conditions from moisture, etc., would quickly rust out unprotected steel sheets. The material is absolutely fireproof and is practically a permanent material that will resist the action of the elements for an indefinite period, requiring no painting or maintenance cost whatever.

The sheets have been used to a considerable extent in the east for private garages and bungalows. The sheets are easily applied over either wood or steel frame, will not absorb the heat of the sun, making the interior of building excessively warm, as the asbestos will not conduct the heat.

Increases Capital Stock.

The California Building Material Company, distributors of the well known Niles crushed rock, has recently raised its capital stock to $50,000, in order to handle the increased volume of business. The demand for Niles crushed rock has exceeded all expectations. Architects and contractors who have used the material once will have no other. According to Manager Wood it is the only washed gravel and rock on the local market. Recent orders taken are for the Hudson Lumber Company's plant, the Pullman shops in Richmond, all sidewalks and gutters in Burlingame, the San Francisco city and county hospital, upon which 5,000 tons of material was used, and numerous other prominent buildings.

More Work for Hoyt Bros.

Hoyt Bros., the Santa Rosa contractors, have recently been awarded two good contracts. They will build the new eight-room grammar school at Orland, from plans by Architect Walter H. Parker of San Francisco, and the new Carnegie library in Livermore, from plans by Architect William H. Weeks. The two buildings will cost $30,000 and $12,000 each, respectively. The Orland school will be of reinforced concrete, with red tile roof, and will be equipped with a warm air heating system, automatically controlled.

Engraving Plant.

A new engraving and etching plant was established in San Francisco a few months ago, under the name of the Franklin Engraving Company, 118 Columbus avenue. The plant is fitted up with the very latest machinery and implements, and the work is entrusted to a competent engraver and etcher. The Franklin Engraving Company has turned out some excellent cuts for several splendid publications, the company's line including zinc and copper half-tones, designs, etc.

Move to New Quarters.

The Western Asbestos Magnesia Company has moved its offices from the Balboa building to 25-27 South Park, between Bryant and Brannan streets, San Francisco.

D. H. Gulick, selling agent for California for the J. L. Mott Iron Works, has removed to room 507, No. 135 Kearny street, San Francisco.

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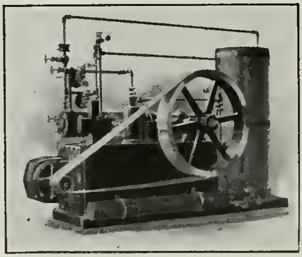

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Why a Building Quilt?

It is gratifying to note that more attention than ever before is being given to the better, more durable and more substantial forms of construction. This advance is most clearly apparent in the building of residences. Houses are now being built so the wind won't blow through them; some permanent method of heating is being thought of and the aim is more and more to have the building last somewhat longer than the sound of the builders' hammers. Durability and comfort, then, are coming into their own as a factor in construction thought.

The value of a means for insulating walls and floors against the chill of winter winds and the heat of summer is being appreciated. This is the reason why there is today a growing demand for the many forms of insulating materials in the Southwest. Particularly is this true in the construction of hotels and apartment houses.

Among the higher classes of products designed to serve this purpose is Linofelt, a building quilt made of chemically treated flax fibres, quilted between two sheets of building paper; waterproof paper, asbestos paper and other coverings are furnished for particular purposes. It is furnished in two general styles, one for sheathing houses like building paper and for laying under floors or in partitions to deaden the passage of sound; this is put up in rolls thirty-six inches wide and sixty-six and two-thirds feet long, so that each roll contains 200 square feet. The second style, which is called Frost-Proof Felt, is designed to fit between studding, with a lap on each side, made in two regular sizes.

There are two qualities of Linofelt, retted and natural. In retted Linofelt the flax fibre is cooked with steam and chemicals, a process known to linen makers as degumming and retting. In fact the principle followed in making this product is similar to that of making linen, only hastened my modern machinery and chemistry. In natural Linofelt the vegetable gums are not removed by retting processes, hence the natural Linofelt is slightly less efficient as a non-conductor of heat, cold and sound, than the retted.

The chief claims of the manufacturers of Linofelt for their product are its excellency as a non-conductor of heat and cold, and of sound; its high sanitary qualities, a most important factor in a building quilt; its moisture-proof qualities; its adaptability to all forms of construction; its low cost compared with the comfort obtained through its use and the saving effected in many different ways.

Linofelt is manufactured at Winona, Minn., where the vast flax fields of that state and North and South Dakota offer a large quantity of the raw materials. The

Philip Carey Company are general sales agents, represented in San Francisco by the Western Asbestos Magnesia Company.

Ornamental Concrete Without Moulds.

The process of making ornamental concrete without moulds has long been held as a secret. It is now given to the public for the first time in this practical treatise.

This is the only work issued which explains a simple practical method whereby the concrete worker is enabled, by employing wood and metal templates of different designs, to mould or model in concrete any cornice, archivolt, column, pedestal, base, cap, urn or pier in a monolithic form—right upon the job. These may be modeled in units or blocks and then built up to suit the specifications demanded.

Full directions are given for making the templates, at a very slight cost of time and labor. In fact everything that a concrete worker needs to know to perfect the many styles of ornamental concrete work without the purchase of expensive moulds, is fully explained and illustrated.

The contents cover the following important subjects:

The proper methods of preparing and handling concrete in moulding ornamental work.

The moulding of all sizes of cornices, archivolts, columns, pedestals, piers, dentils, triglyphs, bases, capitals, modillions, mutules, etc., are fully treated, with detailed drawings showing the proper proportions to mould same in the Tuscan, Doric, Ionic, Corinthian and Composite orders.

Data sheets are also given with valuable rules for determining the proper sizes of different parts of these orders. These are arranged so anyone can use them quickly.

The fluting of columns is arranged by an easy method; any style or form of concrete arch can be easily moulded by this system.

Detailed instructions are given for moulding any style of concrete monument, as well as placing inscriptions on same; how to mould several styles of urns and lawn vases with pedestals, ornamental hitching posts and grave markers, fountains, caps, garden chairs and benches, balusters, lavatories, jardinieres, flower pots and many other forms of ornamental concrete.

The reinforcement of work is treated with illustrations and instructions showing how to make and place same.

Complete details are given of a simple machine, that anyone can easily build, to mould ornamental concrete by this system more rapidly and easily than it is possible with the usual old style moulds in use for this work today.

The book is handled on the Pacific Coast by F. W. Jones, 241 South Whitney street, San Jose, and will be mailed prepaid on receipt of price, $2.

A Remarkable Floor Slab Test.

Architects, engineers and contractors will be interested in the following account of a remarkably successful test of floor slabs reinforced with Triangle Mesh Fabric, for which material the Lilley and Thurston Company of San Francisco are the Coast agents.

"In New York City we continue to receive about three-fourths of the fabric reinforcement business and the test made a week ago in Brooklyn, N. Y., on a 7-foot span with a 4-inch slab of cinder concrete reinforced with only our Style No. 26 Triangle Mesh Fabric which carried, without a sign of failure, a uniformly distributed load of 1,473 pounds to the square foot, should materially assist us in keeping the lead which we have."

The Style No. 26 fabric mentioned has only No. 6 wires 4 inches apart, with 4-inch cross mesh of diagonal wires No. 12½ gauge. The tremendous strength of even a cinder slab reinforced with triangular mesh fabric, due to the bonding of the diagonal wires which assist the longitudinal wires to carry the load is clearly seen; this advantage is impossible in rectangular fabric. Some idea of the universal extent to which triangle mesh is used may be gathered from the fact that the output for 1909 was over 10,000 tons, equivalent to 650 carloads, or over 40,000,000 square feet. The Los Angeles aqueduct alone, where triangle mesh fabric was used exclusively after competitive tests with bars and rectangular fabric, called for over 600 tons.

In New Quarters.

The Robert W. Hunt & Co. Bureau of Inspections, Tests and Consultation has moved its San Francisco office and laboratories from 425 Washington street, where they have been located since the fire, to 418 Montgomery St., near California.

The new location is nearer the center of business than the old one, and is much more desirable in every respect.

Mr. Wm. B. Gester remains in charge of the business as Pacific Coast representative of the firm, which has recently increased, not its field of operations, which would be practically impossible, but the number of its branch establishments by the institution of a branch at Buenos Aires, in Argentina, South America.

This great firm of engineers now has, not merely representatives, but branch offices and laboratories, in Chicago, New York, Pittsburgh, London, San Francisco, Montreal, Mexico City and Buenos Aires. It also has engineers and expert inspectors permanently employed and resident at most of the important points of manufacture throughout America and Europe. Evidence of their work is seen in every civilized country of the world.

Reinforced Concrete Bridge.

A reinforced concrete bridge, to cost about $40,000, has been designed by County Surveyor Lou G. Hare of Salinas, and contracts for the construction of the bridge will be let by the supervisors in July.

The bridge will be located approximately at the point where the present traveled road leading from Greenfield to Metz crosses the Salinas river, one and a half miles above Metz station and two and a half miles from Greenfield.

The structure will consist of 973 lineal feet of steel trusses, with 18-foot roadway, and 540 lineal feet of pile trestle approach.

The steel trusses will be 120 feet spans supported by reinforced concrete cylinder piers. Each pier will consist of two steel tubes five feet in diameter, sunk ten feet below the river bed.

Ross Clarke Busy.

D. Ross Clark, the well known contracting plasterer of San Francisco has about $60,000 worth of work on hand. A number of excellent contracts have recently been taken by Mr. Clark, among them being all plastering on the new St. Mary's hospital, D. H. Burnham & Co., architects. This one contract amounts to over $33,000. Another nice piece of work which Mr. Clark has under way is the Harris apartments, from plans by Bliss & Faville, and the Scottish Hall Association building, Cunningham & Politeo, architects.

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Estimates furnished for electrical clock equipment of every description. Literature descriptive of all the latest recording devices for use in modern building construction, will be sent upon application. ¶The clocks furnished by the Self Winding Clock Co., are the only ones used in the Western Union Telegraph Company's Time Service, and may be synchronized hourly from the U. S. Observatory. By our synchronized clock system any number of clocks will keep exactly the same time and correct time all the time.

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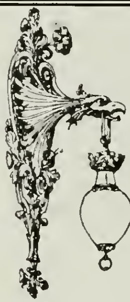

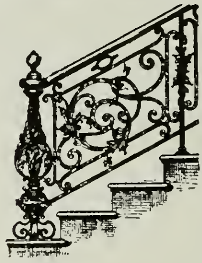

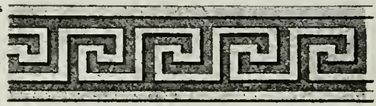

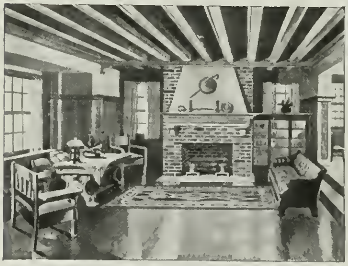


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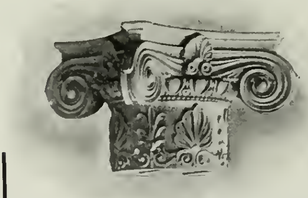

THE ARCHITECT AND ENGINEER

of California

and
Pacific Coast States

JULY 1910

The Kern County Court House, Bakersfield, Cal.

Solution of a Difficult Waterproofing Problem.

A California House in Japanese Style.

The Use of Concrete for Farm Buildings.

25c. a Copy
$1.50 a Year

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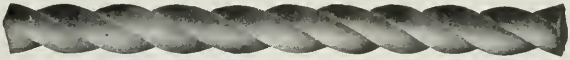

The Architect and Engineer

of California

Pacific Coast States

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Contents for July

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The Architect and Engineer of California
July 1910

PERSPECTIVE, KERN COUNTY COURT HOUSE, BAKERSFIELD, CAL.
Frederick H. Meyer, Architect

THE

Architect and Engineer

Of California

Pacific Coast States

Vol. XXI. JULY, 1910. No. 3.

The Kern County Court House

THE new Kern County court house at Bakersfield, contracts for the construction of which have been let, will be a substantial addition to the list of California public buildings. The architect, Frederick H. Meyer, has worked out an attractive structure in the Classic and has successfully combined beauty and utility, at the same time keeping in mind the unusual climatic conditions of Bakersfield—summer heat at 115 degrees in the shade—and making such provisions as will provide the greatest comfort for the occupants.

The building will be class A, four stories and basement with reinforced concrete floors and tile partitions. The elevations show a clean-cut, carefully studied building with an attractive exterior of White Manti stone. The central motif is decorated with free standing Corinthian columns, while the two end motifs are three-fourths engaged columns, with pilaster treatment for the wings. The parapet over the main pavilion is decorated in bas relief figures and ornaments with a rich cresting over the top.

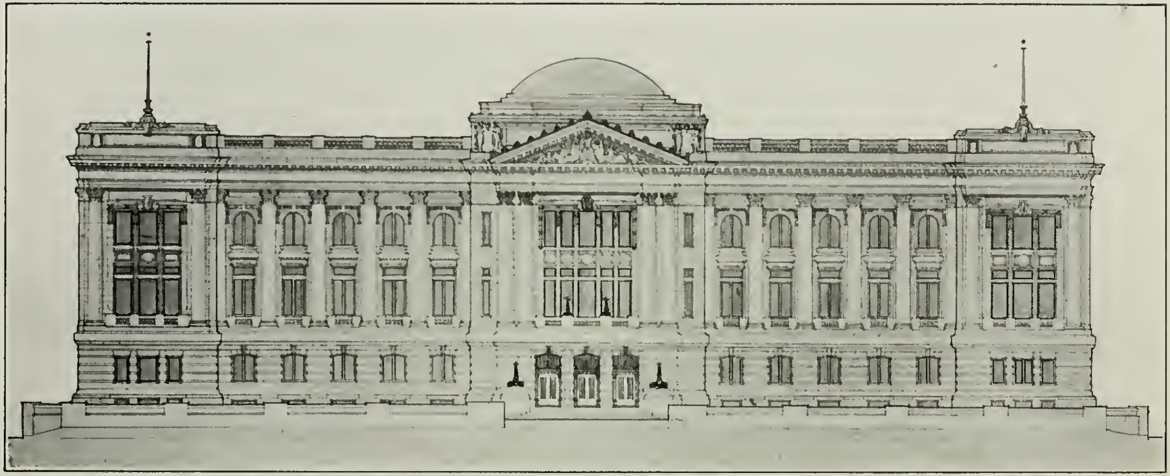
The bay of the central pavilion will be in metal with an ornamental arch and an iron balcony and balustrading at the bottom. The entrance will be highly ornamented with carved stone, bronze doors and cast iron electroliers.

The excavated materials will be used as a fill to form a terrace clear around the building, giving it the proper setting. The lot is 605 feet and the building will be placed in the center, facing Chester avenue, the principal business street of Bakersfield.

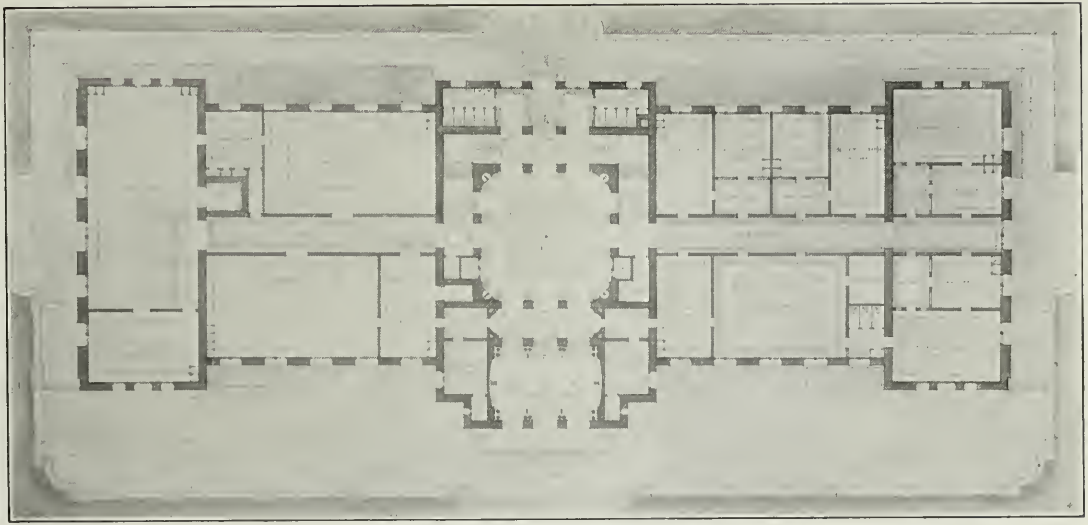
As will be seen by a glance at the floor plans, particular attention has been paid to the planning of the building so as to have the various departments in the most convenient location possible and at the same time place the rooms most used by the public on the north and west sides and thus benefit by the cool summer breezes during the hot months.

The court rooms and library will be situated on the top floor, the same being appropriately finished. A modern steam heating plant will be installed and a ventilating plant will take care of all rooms.

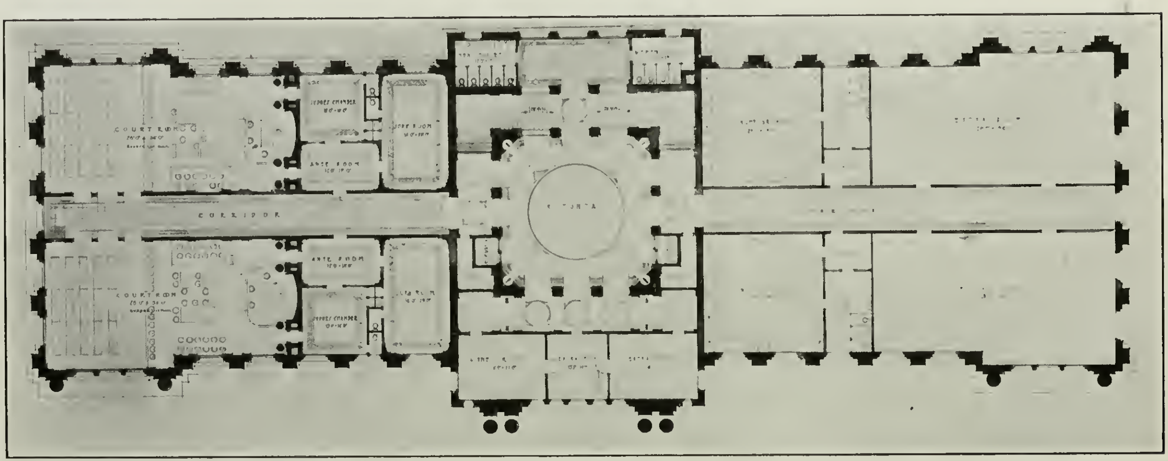
The main rotunda starts at the first floor and runs to the roof, where direct outside light and air are taken from the base of the dome. The finish of this rotunda will be in imitation Caen stone. Frederick J. Amweg of San Francisco has been awarded the contract to erect the building for $340,827.



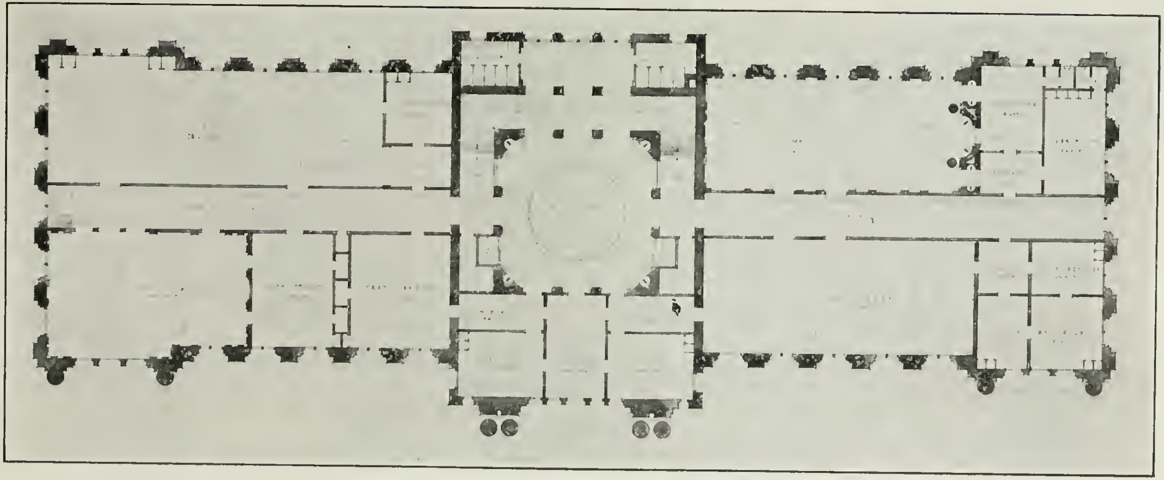
Front Elevation (Competitive Plan), Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



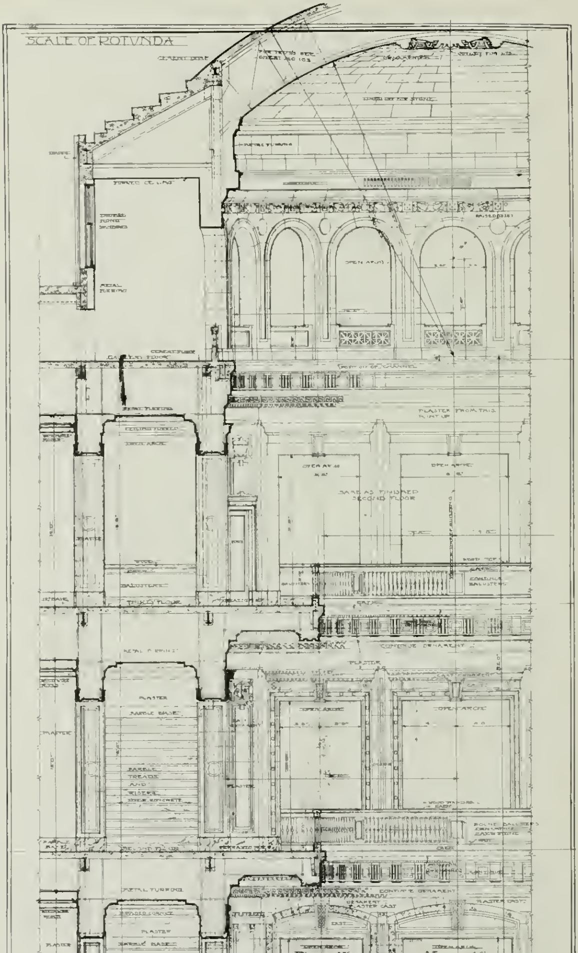
Ground Floor Plan, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



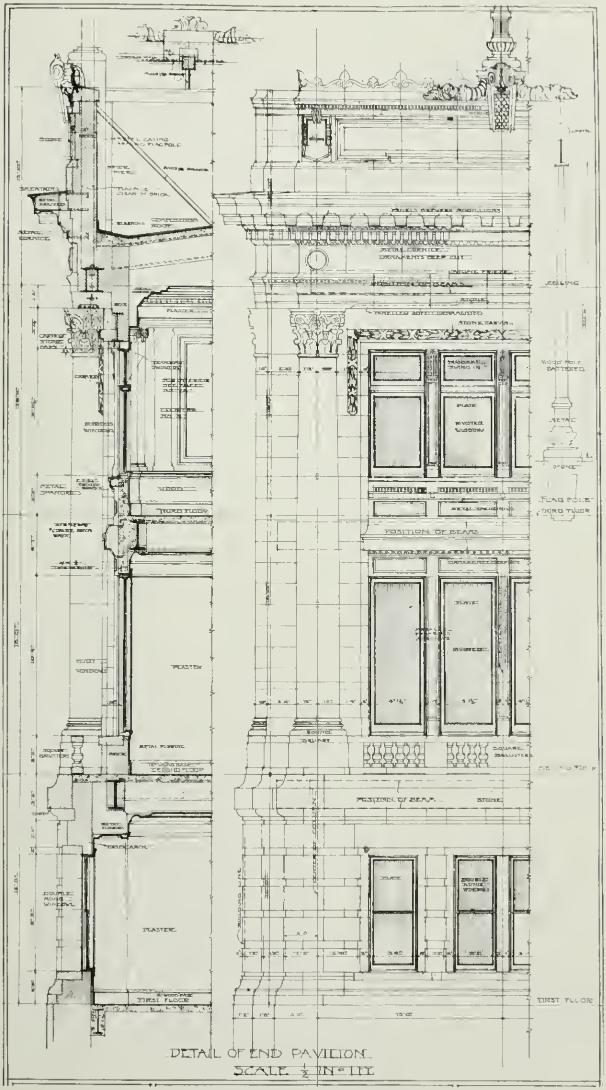
Second Floor Plan, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



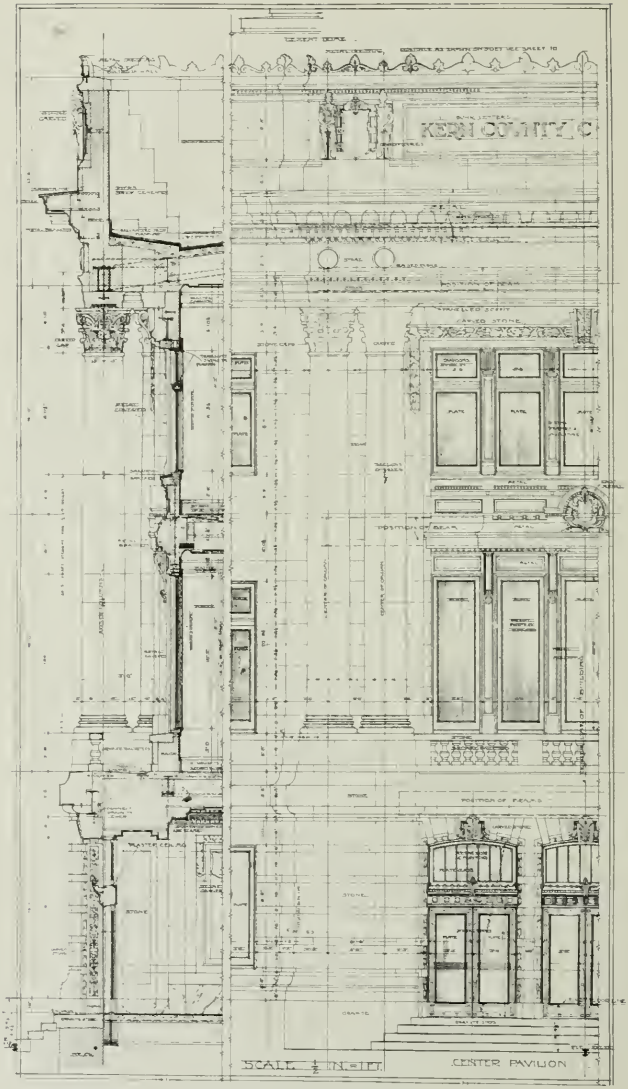
Third Floor Plan, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



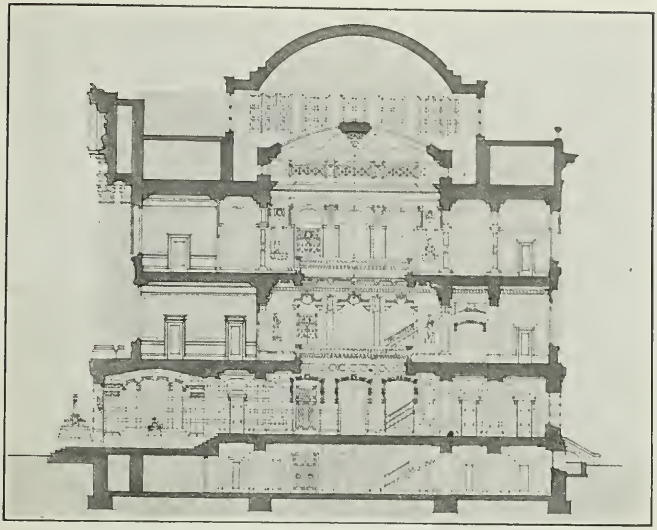
Detail of Rotunda and Dome, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



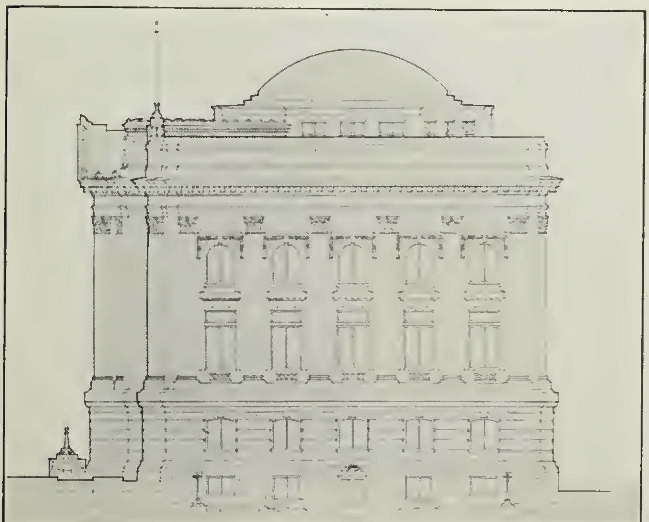
Detail of End Pavilion, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



Detail of Center Pavilion, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect

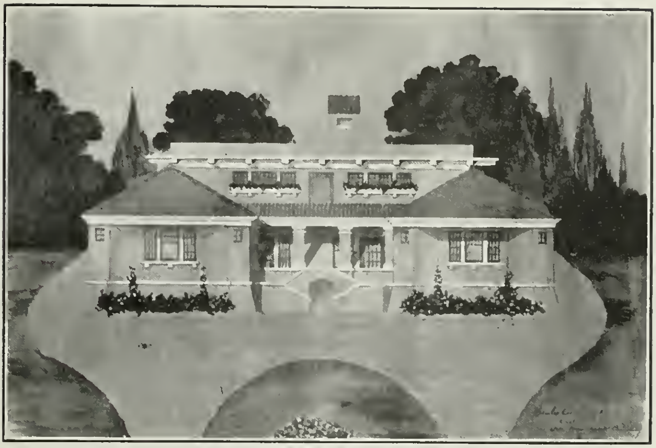


Sectional Elevation, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect



End Elevation, Kern County Court House, Bakersfield, Cal.
Frederick H. Meyer, Architect

Three Attractive Designs, with Floor Plans, for Moderate Cost Concrete or Plaster Houses
Charles Edward Hodges, Architect



Design for a Country House
Charles Edward Hodges, Architect

Domestic Architecture

By CHARLES EDWARD HODGES, Architect.*

HOW many people, especially in California, make a failure of their homes by placing their ideas with the contractor, or with an architect who has not the innate artistic sense to properly plan and carry out all its multitude of small details. For domestic architecture is a distinct branch, and the architect who plans a successful office building is frequently at fault in the intricacies of the home.

The planning of the smaller homes should be limited to square rooms, with an increase in width by the use of shallow bay windows, which admits of economical utilization of the area to be covered.

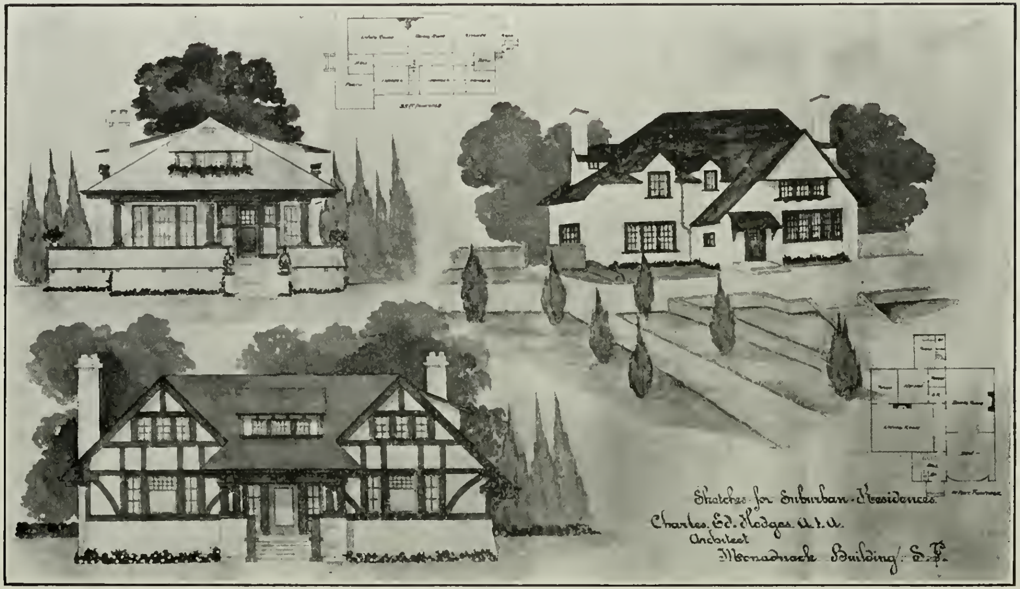
The living room should be well lighted, the window sills being as near to the floor as practicable, so that an unobstructed view may be obtained. French casement doors to the porch lend a pleasing and artistic effect.

The bedroom should admit all the sun that can be obtained, and while the exterior wall space should not be cut up so as to have to consider where to place the various pieces of furniture, it is always advisable to endeavor to get two windows, at least, in this room. Casement windows, wide and low, give an artistic effect for curtains and draping. Large ventilated closets are a necessary adjunct.

The bathroom should be spacious, so that you will not have to shut the door in order to gain access to any fixture. The bathtub should be at least eighteen inches from the wall in order that the floor can be easily cleaned on all sides. Medicine and towel closets can be placed in the partitions at little expense. The window in this room should be sufficiently high for the lavatory to go under, and the toilet as near to same as possible.

The pantry and kitchen are the only two rooms in the house where the sun's rays need not necessarily permeate, but even in California we cannot open our homes too generously to that all-powerful factor in our lives. A modern kitchen for the small home is what is termed the cabinet

*674 Monadnock Building, San Francisco.



Sketches for Suburban Residences
Charles Edward Hodges, Architect

An Attractive Interior.

kitchen, which displaces the serving room with its fixtures, and the housewife has the various utensils for easy housekeeping close at hand. The sink, close to the windows, should have long drainboards at each end, with pot shelf under.

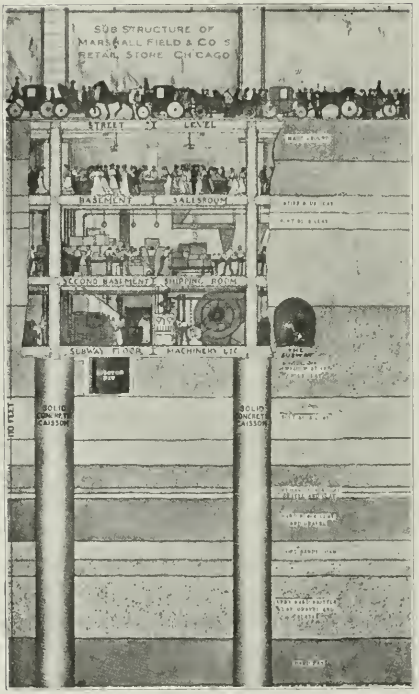
The placing of doors appears a trivial point to some, for you frequently see bedrooms with the doors in the center of the room, whereas the door acting as a screen, should be in one corner, a fact often overlooked. Doors between living-room and dining-room should be wide, and open opposite, so that these two rooms can be thrown into one.

The genius of the architect is called into prominence, as you first approach the house. The proportion and unique treatment of the design shows the home has been planned by one whose profession marks his genius in his work. You see artistic touches on all sides—the porch, doors and windows, are something out of the common, and your interest is awakened to inspect the interior, which indicates "home" comforts. How many of our suburban towns are spoilt by erection of street after street of ugly designs by the local contractors, who give their very much misinformed clients the tempting bait of "plans and specifications furnished free," and in the so-called superintendence erect a monstrosity which only time can eradicate from Nature's beautiful surroundings. If home builders would only bear in mind that we do not in this world give or receive anything for nothing, they would quickly realize that they are paying sometimes very dearly for ignoring the services of the much-abused architect.

* * *

In what respect does a first-class architect and a noted actor resemble? Both draw good houses.

Building Foundations on Bedrock



Sectional View Showing Foundation and Sub-Basements, Marshall Field & Co., Chicago
(Courtesy of Rock Products)

WELLS BROTHERS' COMPANY was awarded the contract for the foundations of the Blackstone Hotel on September 15, 1908, to be completed December 15th. The work was actually completed two weeks ahead of contract time. The foundations consisted of thirty-four solid shafts of concrete averaging seven to eight feet in diameter and extending down to about 110 feet below the level of the street to the solid rock which underlies the city of Chicago.

The digging of wells for caissons in Chicago is a difficult and dangerous undertaking, especially in the vicinity of Lake Michigan and the Chicago river, inasmuch as running sand and water are encountered in great quantities. By means of steam pumps throwing four-inch streams of water out of the wells, the contractors were able to keep the water under control so that the men could continue digging with but little interruption. Otherwise it would have been necessary to resort to the use of compressed air, which would have been an extremely expensive and cumbersome method of operation and would have caused serious delays in the progress of the work.

In the few years since the modern Chicago method of constructing foundations to bedrock has been adopted, in place of the ineffective pile foundations and floating foundations, the new style foundations have been installed in at least twenty-five of the most important buildings in Chicago, including, in addition to the Blackstone hotel, the south section of the Marshall Field retail building, the Congress Annex, the Republic building, the Chicago Savings Bank building, the Commonwealth Edison Company building on Market street, the Ryerson building, the Steger building, the Hart, Schaffner & Marx, the Arthur Dixon building, the Wabash Telephone Exchange building, and the Kesner building.

Waterproofing Concrete Bottom of Medford's Municipal Reservoir

The Solution of a Waterproofing Problem

By SHIRLEY BAKER, Member Amer. S. of C. E.

IN THE construction of a gravity water supply for the city of Medford, Oregon, the writer, as one of the contractors, was called upon to build, as a part of the system, a reservoir, with capacity of two million gallons, and it is with the belief that some of the difficulties encountered in the construction of this reservoir and manner of overcoming them, may prove of interest to architects, engineers and contractors, that this brief article is written.

The finished reservoir was 154 feet square on top and 105 feet square on the bottom, 17 feet deep, with side slopes $1\frac{1}{2}:1$. For about the first five feet in depth the sides were on embankment, the balance of the reservoir being in solid rock excavation. The entire surface was lined with six inches of concrete, that portion in embankment being reinforced with Clinton wire fabric; then two coats of hot asphaltum mopped over the surface of the concrete lining. The concrete was composed of one yard of river gravel to one barrel of Alsen cement, hand mixed.

The reservoir leaked very badly on test. Too much confidence was placed in the waterproofing qualities of the asphalt coating, and the aggregate in concrete was not carefully proportioned. The concrete was laid on the $1\frac{1}{2}:1$ slope of the sides without forms, so little or no tamping could be done. Although great care was used in applying the asphalt coating, allowing the concrete some ten days in which to dry before applying, many air bubbles appeared in this coating, making it practically useless as a waterproof membrane. Porous or honeycombed concrete, with failure of asphalt coating to waterproof, gave results as above stated—a reservoir leaking badly. Further, the leakage had caused the embankment to settle in places, thus cracking the concrete.

The problem to be solved, therefore, was purely one of waterproofing. Although the concrete was quite porous, it was strong enough for the purpose. In selecting this waterproofing, consideration was given to cost, permanency, elasticity, and speed of application. Finally, it was decided to use Neoponset Asphalt Saturated Felt, laid on three-ply on the flat surfaces and six-ply in the corners.

Realizing that the efficacy of this felt membrane depended to a large extent upon the manner and care with which it is applied, it was thought wise to put the matter in the hands of specialists in this line of work, so contract was given to Parrott & Co., of San Francisco, to complete the waterproofing.

The felt was shipped in rolls about thirty-six inches wide, containing four squares each, and was laid lap seams twelve inches apart, so that, in the thirty-six inch width there were two laps, or three-ply, of felt. First, the concrete face was mopped with hot asphaltum of a special mixture, prepared by Parrott & Co., then the first thickness of felt laid on it, care being taken to avoid air bubbles; then more hot compound on top of the felt; then the second thickness of felt, and so on. Finally, the entire surface was "coated in" with this compound.

Then, the entire surface of felt-lined reservoir was plastered with cement mortar, in proportions by bulk of one part of cement to four parts of sand, the plaster being one inch thick on bottom of reservoir and one-half inch thick on the sides. The plastering followed closely the felt laying from day to day, the only function of the plaster being to protect the felt from the hot sun, and from punctures due to walking or laying tools on it, etc., and was in no sense used as an added waterproofing.

Mr. Langdon E. Boyle, manager of the waterproofing department of Parrott & Co., was in direct charge of this work. The value of the method, and the care with which the work was done, is amply demonstrated when the waterproofing was completed, the reservoir filled, and not even moisture showed at the outlet end of the three-inch drain tile with which the bottom of the reservoir was underdrained.

* * *

Hors de Concours

Editor the Architect and Engineer,
San Francisco, Cal.:

In your June edition just received, I have noted the article on the result of the Oakland City Hall Competition, and find that you have made the same mistake as the Chronicle made a few days ago. For your information for future competitions in which the circumstance might arise, the term "Hors de Concours" means drawings set aside or placed out of the competition for various reasons.

I do not mean this criticism to be directed against the two architects whose plans were thus treated, knowing nothing of the merits of the case—but only to correct your error on defining the use of an otherwise commonly known term in architectural competitions.

Yours truly,

WILLIAM MOOSER.

[In justice to Messrs. Bliss & Faville it should be stated that the reason their drawings were set aside was on account of a faint suggestion of color work which the committee decided was in violation of the rules, and not because of any absence of merit in the renderings.—Ed.]

Liability of an Architect for the Accuracy of Preliminary Estimates

By HOWARD C. LAKE

MEMBERS of the profession are often asked to submit plans for a structure not to exceed a certain amount. There are cases of record where plans have been accepted on condition that the structure provided for by them can be erected for a specified sum. Without considering the ethical points involved in such cases, which are matters perhaps best discussed and determined by members of the profession, it is still of considerable interest to examine decisions which have been rendered, and thus view the consequences of the course pursued in each instance.

The general rule is that the architect cannot recover for the plans furnished unless the structure can be erected for the specified amount.

Two western courts have adjudicated this question. In Ada St. Church versus Garnsey (66 Ill., 132) plans were asked for a church edifice to cost a certain sum. Garnsey's plans were accepted provided they could be carried out for a certain specified sum of money. When it was ascertained that they could not be, all the plans submitted were rejected. The architect lost his case on appeal because the court was unable to discover from the evidence that the plans of plaintiff were ever accepted unconditionally.

An association invited architects to submit plans for a building to cost not more than $400,000. Seven of the submitted designs were selected and the architects were invited to explain the plans. Each of these were to be accepted, according to the terms of the offer, and awarded $500 each and from these the final selection was to be made, the designer of which was to be engaged as architect and superintendent. Walsh, an architect, offered his bond that his plan would not cost more than the sum named. The directors resolved to select the favorite plan by ballot with "the understanding that the plans shall be so modified or changed as to suit the wishes of this board, and to cost not to exceed $400,000." Walsh's plans were selected and he was chosen as architect, to become so in fact when his amended plans and "the contract and bond under which this building is to be erected" were approved by the board. The alterations desired added to the cost of the building and Walsh demanded that $25,000 be added to the fixed limit. Negotiations followed and he finally gave notice that, unless this concession was made, he would not make the proposed contract. Another architect was then employed.

This case of Walsh versus St. Louis Exposition, etc., Association (14 S. W., 722) resulted in a decision that the selection of plaintiff's plans was conditional only, that he was not entitled to be employed as the architect and that he had waived his right to have a selection made in accordance with the terms on which competition was invited. The association having offered Walsh the award of $500, became the owner of his plans and entitled to use them, and evidence of similarity between the building erected and Walsh's design was held of no value.

These two cases, so far as we can find, are the only decisions in point in the courts of this country. They seem correctly decided in principle and lay down the law with clearness and fairness.

The actual cost of the building must be reasonably near the estimated cost. Unless this proves to be the case, the architect is without redress for plans submitted. In the English case of Moneypenny versus Hartland (1 C. & P., 352) a surveyor made an estimate which proved grossly inaccurate because he did not examine the ground and it was held he could recover nothing for his plans and specifications.

In another English case (Nelson versus Spencer, 2 F. & F., 613) an architect drew plans for a school building. The trustees had only a certain specified amount to pay for it. After drawing the plans the architect estimated the cost at nearly two hundred pounds more than the trustees had. He asserted that his buildings "never exceeded the contracts" unless the owners interfered. Later he suggested alterations which he thought could be included in the estimated price. The lowest building bid was over seven hundred pounds more than the trustees had on hand and they refused to act. The drawings were sent back to the architect. In his suit for compensation, it was held that it was a question of fact for the jury to determine, whether the estimates were reasonably near the actual cost. The jury disagreed.

But one other point remains to be considered with regard to the general question of cost limitations. Are the architect's fees a part of the estimate? It was held not in Smith versus Dickey (11 S. W., 1049) where a building was to cost "about $100,000," and an architect submitted estimates of a building to cost $102,000, exclusive of architect's and superintendent's fees, the latter of which, according to the architect's testimony, would have been 5 per cent if he had superintended the building. The architect won his case, the Texas court holding that he had sufficiently complied with the contract, saying that it did not "regard the architect's fees as a part of the estimate, but, if they are to be so regarded, we think the gross sum was about $100,000 and a compliance with the contract, as testified to by the appellee" (architect).

To summarize the law generally it may be said that an architect cannot recover if the building cannot be erected for the specified sum, or if the actual cost is not reasonably near the estimated cost, and that the fees of the architect are not a part of the estimate.

Whether the architect should furnish an estimate which it seems the courts construe as in some measure a guarantee is a matter for him to decide, or if the owner after an estimate is given insists on expensive additions or changes, the architect would do well to protect his estimate at time changes involving increase in cost are ordered.—American Architect.

* * *

Razing a Steel Frame Building

An interesting building operation which is soon to be commenced at the northwest corner of Nassau and Wall streets, Borough of Manhattan, N. Y., will involve the razing of the nineteen-story steel-frame Gillender building. It is estimated that there are more than 1000 tons of structural steel in the building, but that in its demolition a record will be established, as this is without doubt the highest building in the world to be taken down for the purpose of erecting another tall structure on the site. The work of wrecking this nineteen-story building, which less than twelve years ago cost $500,000 to build, is in the hands of Volk & McGinness.

The new building will be about 500 feet high, making it by far the tallest structure in the Wall street section. It will have 37 stories and is estimated to cost four million dollars. It will occupy not only the site of the present Gillender building, but also of the Stevens building adjoining on Wall street.

* * *

Courtesy to customers is a commodity never cheapened by oversupply.

Brick Paved Highways*

By W. P. BLAIR, Indianapolis, Ind.

THAT the interest of a manufacturer of a machine or appliance should follow it into the hands of the consumer, that he should instruct and advise as to the manner and method of its use in order to obtain the best possible service, has for years been accepted as perfectly proper. It is conceded that a sensible manufacturer designs his product for public appreciation, and the effort is to produce something that will wear indefinitely or serve its object most perfectly and depend upon increasing popularity in an ever-extending market to absorb the product. The manufacturer who pursues any other course either fails to realize the market 80,000,000 consumers offer, or is attempting commercial suicide.

New and untried articles are generally put out by demonstrators and in recent years several of our largest and most successful manufacturing industries have been built upon the exploits of these so-called experts. The reaper grew into its present state of perfection not in the factory, but out in the wheat field, where representatives of different machines vied with each other to make the record cut under test conditions. Weakness thus exposed was immediately corrected, and in this line we no doubt have the survival of the fittest.

That an article of such common, everyday knowledge as a brick needed any such expert demonstration was doubted by the manufacturer himself, and practically hooted at by the public, but as the public grows wiser it realizes how little it really does know.

Probably one of the first branches of the clay industry which found it necessary to employ experts was the drain tile man, who found himself flooded with complaints that water would not run through his tile, and who generally found that an attempt had been made to run it up hill instead of down, that there had been an attempt to put 8 inches of water through a 6-inch tile, or that the whole trouble arose from an idea that the tile ought to take water through its pores instead of at the joints, and with this in view, a tile so soft had been employed that it was soon dissolved and the flow stopped.

There is perhaps no part of municipal work which has been subject to more experiment than street pavements. There is no part of the work, on the other hand, that is simpler of solution in a way to be satisfactory to the user, economical to the taxpayer, and a credit to an administration. The solution is a brick pavement carefully, properly constructed, in the manner which the manufacturers recommend and which they are endeavoring to impress upon the servants of the public, and which to obtain they are bringing as much influence to bear as is possible to exert through the channels of legitimate advertising and publication for free distribution of text books upon the subject.

The effect of this campaign is to at least occasionally secure a piece of pavement which is an object lesson to the neighboring towns and a stimulus to the business in that community, for, once the merits of a thoroughly good brick pavement become known, the property owners, who pay the bills, insist that no other material be used. In spite of these proven conditions, however, we find an occasional manufacturer who is so indifferent to his own interests that he allows, without expostulation, his material to be used to its greatest disadvantage and refuses to bear his proportion of the expense necessary to an education of the public. Gradually competi-

*A paper read before the National Brick Manufacturers' Association.

tion closes in around him and his plant is offered for sale, the confidence in his material destroyed at home and its reputation gone in outside markets—simply a result of a short-sighted policy, avoiding responsibility after his product has passed his kiln doors or he has received his money.

The effect of the attitude of the manufacturer of paving brick upon the public is far more serious and far-reaching. Truthful, reliable information upon the subject of paving material in general, and the manner of constructing brick streets in particular, means the saving of thousands of dollars annually to the taxpayer in repairs and maintenance, as well as first cost, and means comfort and satisfaction to all who use the public highways, to say nothing of the cheapened cost of transportation.

Engineering problems have been many and varied during the last past decade. In the designing and building of bridges and edifices of many kinds, in the building and equipping of steam and electric lines, water works and electric lighting, the skill and ingenuity of the engineers has kept pace with the progress of civilizing advancements. It is a fact, however, inexplicable as it may be, that the designing and construction of vitrified brick roadways, as they have been built for the most part in the last ten years has been a wanton waste of money; viewed from an engineering standpoint, a disgrace to some one and an awful burden upon the taxpayers.

At whose door this responsibility shall be laid, I will not undertake to determine. Interested as I am in the brick business, if I could revolutionize this condition of things I would gladly do so. I believe the engineers of the country can, if they will, so change the practice in building vitrified brick roads that those that are to be built in the future shall be similar in quality to those that are found in such cities as Cleveland and Sandusky, Ohio, and Grand Rapids, Mich. Regardless of the influences that have induced and persuaded brick street building as now obtains, is it not possible to reach such a certain conclusion by reasoning together as will properly direct and cause us to build brick streets at their best?

I have been actually present on few jobs where the sub-grade has been properly and carefully prepared so that it conformed to the grade of the finished street. The sub-grade is often devoid of any proper compression. In most instances, no two consecutive square yards are alike; one square yard may be to grade, but the next one may be one inch below grade, but exactly to grade is a condition not found. (Not infrequently the specifications require the use of a roller so heavy that it is quite impossible to compress the sub-grade at all.)

In the very next step it necessarily follows that a uniform thickness of foundation is impossible. However, the first defect mentioned might be cured to a very considerable extent (by increasing the concrete in depth wherever necessary), but here we are met by the contractor's selfish interest, and it is next to impossible to compel him to put in more than the required depth of concrete foundation that the surface of it may be uniform with the grade of the finished street, and that it may be made smooth, for it is absolutely essential in the construction of a brick street that the surface of the concrete foundation be made smooth. Now, what I mean by smooth is, not that it shall be perfectly smooth; rather, that it shall be so nearly smooth that no depression shall be found or elevation permitted exceeding a quarter of an inch above or below the proper grade.

I know that for the engineer to require this condition of surface is often met with a very serious objection. I have had many contractors insist that it is not possible to procure either broken stone or gravel in size or in any proportion of mixture making possible this requirement, and engineers requiring it have been denominated cranks, to my knowledge. Yet concrete foundations have been put in exact accordance with the contract specifying that this shall be done. Without such a prerequisite there is no possibility of using a 2-inch sand cushion upon which the brick are to be laid.

But why a 2-inch sand cushion? And why not a 1-inch sand cushion, as is known to have been called for by the government in one of its navy yard specifications, and under which proposals are to be received within a few days. Why not 1 inch? Simply for the reason that 1 inch will not afford sufficient relief from the vibration formed by the impact of the hoof or vehicle upon the street. The suggestion may be made that the brick should be hard and tough enough to withstand the action of the vibration, but not so. Take away all relief and what is the result? With a small tack hammer you may chip and in a very short time the entire brick may be broken away, if it be placed upon an entirely rigid surface.

Why 2 inches? Without undertaking to give you the physical reason, I will simply say that a 2-inch sand cushion does afford the necessary relief to protect the brick against chipping and destruction from the vibration to which it is necessarily subjected.

Why not more than 2 inches? For the very reason that it is impossible to compress exceeding 2 inches to a condition that will afford any support to the load to which it will be subjected incident to ordinary travel.

So the brick must have this necessary relief; they must have the necessary support, in order that the surface of the pavement under constant use, will remain free from depressions; in order, also, that the cement filler with which the interstices are filled be not necessarily subjected to a strain that might shatter, crush or tend to crush such joints. A brick street, to be entirely satisfactory, must be entirely free from depressions, every part conforming to grade. This condition must obtain at its construction and remain so during its use, so that the traction resistance shall be at a minimum and the wavy condition avoided. This result must be anticipated in the preparation of the sand cushion, first spread at the estimated depth of 2 inches and these depressions avoided by the use of a hand roller, weighing, say, from 300 to 400 pounds; additional sand applied, rolled and screened again, I should say, at least three times. At the last screening it will be found that the uncompressed sand will not be over ¼ inch in depth at any one point. With such a condition it can be readily perceived that when the brick shall have been placed upon such a cushion, no greater compression will follow the use of the roller upon the brick than is necessary to take care of the uneven height of the brick themselves.

It is certain also that in ironing out what few depressions remain and compacting the brick into the cushion, but very little sand will be pushed into the interstices by the final rolling. By this suggested method the grade of the finished street may be conformed to most perfectly. It is often the case that specifications should contain express directions as to manner and method of work; otherwise, it would not be possible to reach results desired. This is particularly so in brick street construction.

The brick should be dropped in straight lines upon the sand cushion, with the best edge of the brick uppermost. Economy for the contractor would require that the brick be brought to and deposited within reach of the person who actually lays the brick in a way that will accommodate his method of dropping them in place, insuring the best edge uppermost. Yet many contractors will insist that dropping them in any way, wrong edge or right edge up, in the street and then paying for the service of a man to turn them over with tongs is an economical method. But, previous to dropping the brick in the street, attention must be given to the necessary provision for expansion cushion next to the curb. It too frequently happens the arrangements for this are improvised without thought as to results.

The board should be prepared by beveling a joint eight (8) inches in width, the thickness determined largely by the width of the street. Even in a narrow street the expansion cushion should not be less than 1 inch; 1¼ inch for a 30-foot street, and 1½ inch for a width exceeding 30 feet. This board should be placed next to the curb, worked slightly into the sand cushion before the brick are laid, and remain until the street is finished in all other respects, after which it should be removed within twenty-four (24) hours following the application of the cement filler. The board beveled and being eight (8) inches in width, it is very easily and rapidly removed, leaving a perfect groove in which to pour the cushion material.

After the brick are dropped into the street the surface should be swept, precaution theretofore exercised that no brick go into the street which are dirty, or, after in, that they are not made so by use, as it is impossible for the cement filler to adhere to a dirty surface. After the sweeping, thorough rolling must take place by the use of a roller not weighing over five (5) tons.

As to the filler, the most difficult problem is to convince the public of the utter worthlessness of all other fillers in comparison with the cement filler, and to bring about a full appreciation of the necessity of the proper application of the cement filler. A cement filler that is mostly cement is too brittle, and one that is less than in proportion of one to one is too weak and soft. The specifications must therefore call for a proportion of one to one, and the necessary skill must be employed to put in place in such proportion; if otherwise, the so-called cement filler is unsatisfactory. Compliance with the simple rules we employ will secure the result, exacting, but easy and economical to follow. Why not follow them rather than the hundreds of different methods that invariably bring a failure?

The filler shall be composed of one part each of clean, sharp sand and Portland cement. The sand should be dry. The mixture, not exceeding one-third bushel of the sand, together with a like amount of cement, shall be placed in the box and mixed dry, until the mass assumes an even and unbroken shade. Then water shall be added, forming a liquid mixture of the consistency of thin cream.

The sides and edges of the brick should be thoroughly wet before the filler is applied, by being gently sprinkled. From the time the water is applied until the last drop is removed and floated into the joints of the brick pavement, the mixture must be kept in constant motion.

The mixture shall be removed from the box to the street surface with a scoop shovel, all the while being stirred in the box as the same is being thus emptied. The box for this purpose shall be 4 feet 8 inches long, 30 inches wide and 14 inches deep, resting on legs of different lengths, so that the mixtures will readily flow to the lower corner of the box, the bottom of which should be 6 inches above the pavement. This mixture, from the moment it touches the brick, shall be thoroughly swept into the joints.

Two such boxes shall be provided in case the street is 20 feet or less in width; exceeding 20 feet in width, three boxes should be used. (See specifications for making same.)

The work of filling should thus be carried forward in line until an advance of 15 to 20 yards has been made, when the same force and appliance shall be turned back and cover the same space in like manner, except to make the proportions two-thirds Portland cement and one-third sand.

To avoid the possibility of thickening at any point, there should be a man with a sprinkling can, the head perforated with small holes, sprinkling gently the surface ahead of the sweepers.

Within one-half to three-quarters of an hour after this last coat is applied and the grout between the joints has fully subsided and the initial set is taking place, the whole surface must be slightly sprinkled and all surplus mixture left on the tops of the brick swept into the joints, bringing them up flush and full.

After the joints are thus filled flush with the top of the brick and sufficient time for hardening has elapsed, so that the coating of sand will not absorb any moisture from the cement mixture, ½ inch of sand shall be spread over the whole surface, and in case the work is subjected to a hot summer sun, an occasional sprinkling, sufficient to dampen the sand, should be followed for two or three days.

It is impossible in a paper of this kind to enter into and discuss all the details of construction essential in building of a vitrified brick street at its best. But is not their importance of sufficient interest to command serious attention? In 1909, 8,000,000 square yards of brick pavements were laid in Indiana.

The difference in cost between a good brick street and a bad brick street is so little that it should not be considered. It is true that a matter of one, two or three thousand dollars in the cost of a whole street seems like a saving if a street could be built for less, but considered in connection with the cost of the whole street, which often ranges from forty to one hundred thousand dollars, the advantage to be gained by saving one, two or three thousand dollars is infinitesimal.

As to the difference in actual cost—take, for instance, the foundation, the point wherein a brick street fails more often than in any other respect is that it is put in with a rough and uneven surface, instead of a smooth surface conforming to the grade of the finished street. Now, the increased cost necessary for the contractor to have the foundation smooth cannot possibly exceed the cost of one of the roughest character 1 cent a square yard. If, however, this foundation is left in a roughened condition, in all likelihood the real value of the street, both as to its durability and possibilities of its use, decreases fully 50 per cent.

Again, supposing the foundation is made right and a sand cushion of 1 or 1½ inches in thickness, or a sand cushion utilized on which the compression is very uneven, so that it cannot be maintained at a uniform 2 inches, in such cases the difference in cost of a sand cushion put in lacking in either quantity or condition cannot possibly be accomplished at a saving of more than 1 or 2 cents a square yard less than one exactly and uniformly 2 inches, thoroughly compressed. Yet the want of the uniform 2-inch properly compressed sand cushion insures a percentage loss in the value of the street of more than 50 per cent.

Again, a step upon which depend the highest possibilities of the brick street—the proper rolling of the brick after they are in the street, and the ironing out of any slight depressions found to exist cannot possibly differentiate in favor of insufficient and improper rolling exceeding even 1 cent a square yard.

Again, as to the proper application and use of the cement filler, there is no excess of cost either in the use of cement as a filler or its proper application over and above that of an improper application, or the use of some soft, absolutely worthless filler that is often utilized for this purpose at a cost greatly in excess of the cement filler properly applied, the value and satisfaction of which meets every demand.

To sum up, therefore, in actual money expenditure, the difference in the construction between the good brick street and the bad brick street cannot possibly exceed 10 cents a yard, to say nothing of the great advantage to be obtained in the good brick street in meeting every possible requirement of an exacting public in its use, as well as securing the utmost economy by reason of the great durability.

All this is not said by way of complaint. The ability of the engineer is not doubted, but human nature is alike in all professions and in all callings. Indifference toward many things comes alike to all of us—likewise our interest. So our attitude in this whole matter is one of petition. Our attitude is not much different from the little boy who closed his eyes and prayed for a white rabbit, but, on opening them, beheld no white rabbit. He closed his eyes a second time and prayed, with the same result. The third time he prayed vehemently, not even closing his eyes, saying, "Lord, we want that white rabbit, and we want it now!"

* * *

A Method of Numbering Drawings

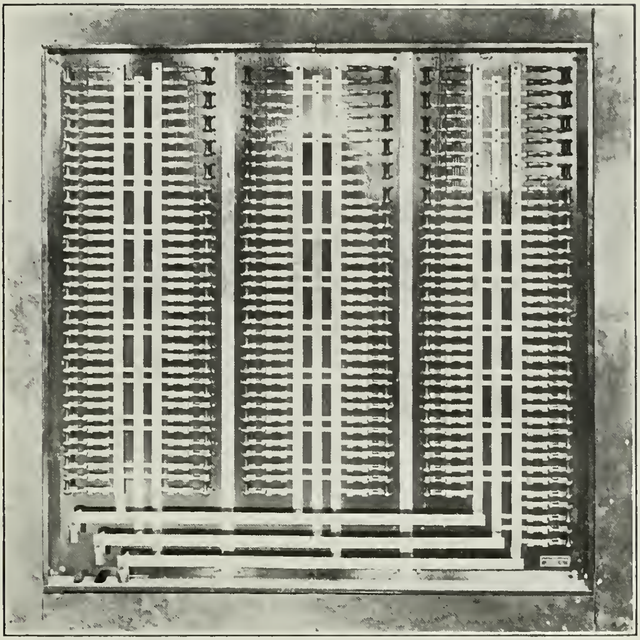
In order to number drawings in a convenient manner and make it easy to find any section or detail referred to on an assembled drawing or plan, Mr. I. W. Jones, engineer and designer of water power plants, Milton, N. H., has devised a system which is self-referencing.

The various sheets for a given job are designated alphabetically, from A onward. When there are more than 26 sheets on one job, the 27th is called AA, the 28th AB, and so on. The different views, sketches and details on a sheet are designated numerically and the sheet letter attached to the number. For example, the third detail on sheet D would have as its title, No. 3—D. When sections are taken they are given titles which show the letter of the sheet on which they are detailed, and a number corresponding to the position on that sheet. If, for example, a certain cross-section line on one of the plans is marked 2—H, it means that the drawing of this section will be found on sheet H and that it is the second section or detail on that sheet. All section lines are lettered at both ends and have arrows to show in what direction the section is taken. Moreover, if a piece of machinery indicated on a plan is marked "See Detail 9—M," it would mean that the detailed drawing of the object is No. 9 on sheet M. The scheme thus saves considerable time over one that is not self-referencing. Mr. Jones states that it has been found very satisfactory.

Each job is given an individual number which consists of a combination of a consecutive job number for the year in which it was taken, and the last two figures of the year. For example, job number 1009, means that the job was the tenth one taken up in 1909, while the 25th started in that year would be numbered 2509. By this method both plans and files indicate at a glance when a given piece of work was taken up.

* * *

"Why don't you bring out an umbrella on a drenching day like this?" inquired a man of a neighbor's son. "Since father gave up his club he's never brought home any more umbrellas," replied the lad.—Philadelphia Inquirer.

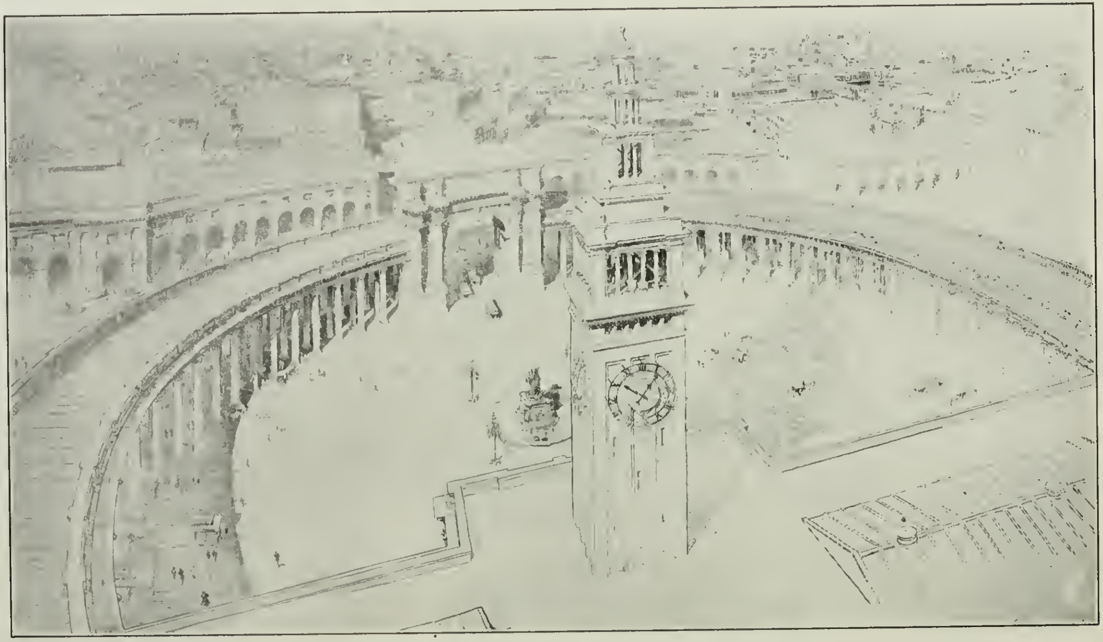


Huge Panel Switchboard for Portland Bank

Largest Panel Switchboard on the Pacific Coast

THE largest panel switchboard on the Pacific Coast recently has been completed by the Butte Engineering and Electric Company of San Francisco. The board will control the ceiling lights in the Ladd & Tilton bank which will occupy the ground floor of the new Spaulding building being erected at Portland, Ore., from plans by Architect Cass Gilbert of New York City.

The board is 84 inches wide and 61 inches high, and controls about 1300 lights on 110 different circuits. The board also will be used for controlling the electrically operated adding machines in the big bank. The Spaulding building is a Class A structure, twelve stories high. The Butte Company took the electrical contract on this building for $15,000.



Proposed Arch and Peristyle, Foot of Market Street, San Francisco
Willis Polk, Designer. D. H. Burnham & Co., Architects

Arch and Peristyle for Lower Market Street, San Francisco

By WILLIS POLK, Architect

THE time has come when something ought to be done to relieve the congestion at the foot of Market street, in San Francisco. It is just as important to do it in an artistic way as in a practical way. It ought to be done on big, liberal lines, in keeping with the spirit of the city.

Some kind of monumental architecture at this point is just as essential as a merely practical solution of the congestion problem.

The arch and peristyle which I designed is just a suggestion. I do not say it is entirely practical. But something big and imposing is needed.

If something like the colonnade were adopted, either for ornamentation or for the carrying of elevated tracks and footways, it would necessitate the taking of considerable ground now occupied by small, unsightly buildings. There ought to be a broad semi-circular open space extending back to the west side of Steuart street, two-thirds of the way to Mission street and almost to Merchant street. This would involve the cutting off of the southwest corner of Merchant and East streets and the corresponding corner on the opposite side of Market street where Sacramento and Commercial streets come in.

This would give sufficient space for carrying out the arch and peristyle plan and be large enough for all time. We should have an area here that would give a feeling of space and bigness as well as ease of access and a handsome appearance in general. If property should be condemned for additional room it ought to be done now before it becomes more valuable.

Paris is just now voting $300,000,000 worth of bonds to carry out the Baron Haussman plan for beautifying the city. This plan was formulated in the time of Napoleon III. Even the present appropriation will not complete it; a hundred years more may be required to do that.

San Francisco ought to plan for her future development on broad and liberal lines, as other great cities are doing. The entrance to the city deserves special attention. The moral effect of the first impression upon newcomers and visitors counts for a good deal. If they first set foot in a great rotunda they say: "What a magnificent city!" Or if they find themselves in a congested spot, or in a space with ugly overhead iron bridges, they will say: "What a horrible city!" and go away with that impression.

I worked several years on my arch and peristyle plan and spent thousands of dollars in surveys and detailed plans. This plan calls for a colonnade the same height as the front of the ferry building. The plan provided for an elevated corridor for foot passengers midway between the ground and the roof of the colonnade. The peristyle form is just a suggestion to combine the beautiful and practical.

I think it is time to stop adopting makeshift plans and do something on broad and liberal lines that will provide for the future as well as take care of present needs.

* * *

The Work of Parkinson & Bergstrom

The work of Messrs. John Parkinson and Edwin Bergstrom of Los Angeles will be shown in the August issue of the Architect and Engineer. The success of this firm has been phenomenal, and much interest will undoubtedly be taken in the great number of illustrations that will be shown. At the present time Messrs. Parkinson and Bergstrom have buildings under way or in prospect valued at fully $6,000,000.

Bungalow at Pasadena, with Japanese Treatment
Green & Green, Architects

View of Same House from the East

A Southern California House in Japanese Style

By A. W. ALLEY*

SOUTHERN California is blessed with many wonderful and beautiful things, and with a number of fine architects. Los Angeles and Pasadena, particularly the latter, have many fine examples of their work. The accompanying illustrations are of a much-talked-of place in Pasadena.

The architects, Messrs. Green and Green, have carried out a Japanese style of architecture. The foundations are of clinker brick set with black mortar. Oregon pine is used for the timber work, and split shakes, stained to dark green, for the sidewalls and main roof, while the porch roofs are covered with prepared roofing. All the exposed lumber is cleaned with a wire brush and all edges and ends rounded. The beams and porch railing, as well as every piece that is exposed, are put together with dowels or wrought-iron bands and the construction shows no nails. A full-size detail for practically every piece of timber was necessary and all labor in cleaning and rounding edges, etc., was handwork. The gutters and spouts are of copper. Casement windows are used throughout.

The house faces north, commanding a beautiful view of the San Gabriel Mountains and the foothill towns. Two wings, one on the west, and another on the east, form a small court with a southern exposure. The large covered terrace on the northeast affords not only a fine view of the mountains but also of the Japanese garden and pond, and a fine view of the lower San Gabriel valley. The terrace opens off the living-room, which, with its large porch windows will make a fine out-of-doors living-room. The two upstairs porches on the wings add not only to the beauty of the house, but are especially useful in this climate. The east porch being without a roof makes a fine, sunny place for winter use, and the west porch for summer will be shady and cool, catching the ocean breezes from the southwest. It also has a recess that can be used for a sleeping porch.

All the other structures on the place, including a garage, gardener's cottage, greenhouse, pergolas, and even the fence around the vegetable garden, show the same careful details.

The owner, architects, and gardener combined in laying out the Japanese garden and grounds, and from every side the place presents a beautiful picture.

A special feature of the front is the massive bridge-like construction of the porte-cochere. Yet in spite of its massiveness it is in perfect harmony with the whole. The prepared roofing is used extensively here on low, flat roofs and as can be seen in this house, adds to the beauty. The main roof is worthy of note, owing to its perfect system of ventilation by the many gables, making it impossible for the heat to affect the second-story rooms. All the trees and shrubs are new or transplanted, and two years ago the lot was vacant.

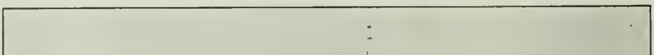
In the interior of the house the same careful regard for detail is shown as in the exterior. The various woods have been exquisitely treated and no pains have been spared to make the rooms not only beautiful but accurate, in so far as Japanese effects may be carried out in an American house.

*Contributor to "House Beautiful."

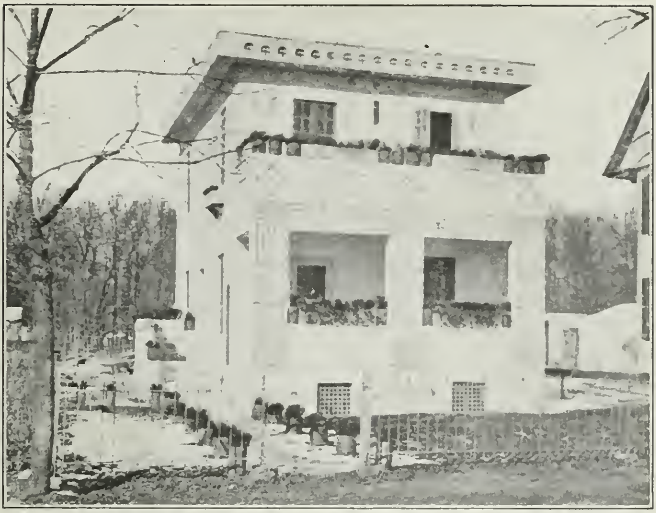
* * *

Let us all curb our personal conceits, and give to others the benefit of our mistakes.

The New Mission Savings Bank, San Francisco
Crim & Scott, Architects



Country Home at San Jose
Wolfe & McKenzie, Architects



The Morrill Germ-Proof Concrete House. A Sanitary and Fireproof Structure Designed to Reduce the Complications of Housekeeping to a Minimum

Building a Germ-Proof House

AT Brentwood, Maryland, near Henry street, one block away from the street car, a model house has been constructed during the past few months, says a writer in Cement Age. The house is designed on lines of the model which received the first gold medal at the late International Congress on Tuberculosis, and is the first building of its type to be constructed, and to demonstrate the practicability of the plan.

It was planned by Milton Dana Morrill, architect, Washington, D. C., and embodies many unique features. The entire house is fireproof, there being no wood except the sash and the doors.

The house is not large in dimensions, and has been planned for a small family where housework could be reduced, and where servants' help would be unnecessary. The saving of steps has been given especial consideration.

The house was built in standard sectional moulds which are a part of the equipment for this type of construction. To thoroughly clean a room a hose is used, the cement floors being graded to plugged tiled spouts discharging on the lawn.

An enclosure for the garbage pail is left under the washtub which has an outside screen door for ventilation and removal. This is arranged also to be flushed out. A small wood strip is laid in the floor border so that rugs or carpet can be tacked in place, if desired. All corners are coved, and all fixtures are bracketed from the wall, which leaves no places for the shelter of dust or vermin, and facilitates in cleaning.

The waste heat from the kitchen range warms the house through circulation of hot water, being so built that in summer an inside firebox cuts off the house heating system.

All fixtures, such as kitchen sinks, washtub, lavatory and bathtub, are cast in concrete and given a very smooth cement finish.

For the water supply a concrete tank is built in the top of the bathroom which is filled from a small force pump at the kitchen sink. The windows are of a casement type, swinging out, with no trim, but with a stencil border sash being hinged to simple metal strips, which forms a weather-tight joint, the whole sash area being opened for circulation or air

The building has no exterior ornamentation, as the flowers and vines in the window boxes give the best of decoration and color. Why do we have flowers and ornaments of stone when we can have genuine flowers which are much more beautiful and decorative?

These flower boxes (of course they are of concrete), now contain small cedar trees gathered near the site, and the vines are the wild honeysuckle which grows in such fragrant tangles all about.

At the front of the house there is a porch with balcony above, and there are also smaller porches at the side and rear of the structure.

On the first floor the living room, 11 feet by 18 feet, occupies the front, having three windows. The stairway is in the center of the house so that no space is lost, and in the rear another room 11 feet by 18 feet will serve both as dining-room and kitchen. Fixtures are screened when not in use.

The second floor of the house contains one large bedroom at the front with four windows and a smaller bedroom at the rear, each having ample closets. The bathroom is also located at the rear.

This house has attracted much attention during its construction as being the first of its type to be built. It is the intention in the near future to start a considerable group of houses of a similar type at Virginia Highlands, where extensive land has been bought for this purpose, to build a model community where the administration of the suburb will be co-operative.

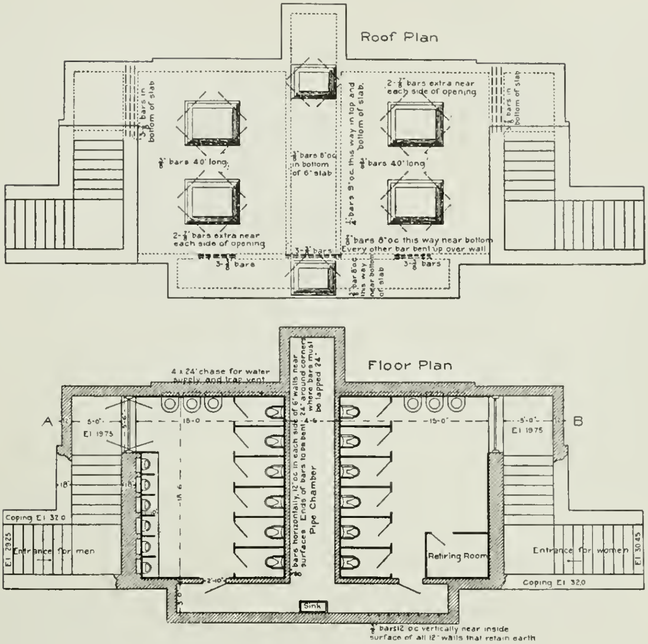
The value of a fireproof house is being considered more each day, and the Brentwood residence is a very interesting example of the great artistic possibilities in concrete as applied to small house construction.

While this house costs somewhat more than a similar structure of frame its fireproof and sanitary qualities, together with the fact that it requires no insurance or repair, makes this type in the end much less expensive than our usual frame houses with their continual output for paint and repairs.

* * *

Artificial Lighting for Schoolhouses

A series of tests was recently conducted for the Board of Education of Newark to determine the best form of lighting for schoolrooms. The rooms in which the experiments were tried measured 22 by 34 feet, and were 12 feet high. Three systems were tried, consisting of 22 16-candlepower lamps, 5 75-candlepower graphitized filament lamps, and 5 100-watt tungsten lamps with glass reflectors and frosted tips. The tungsten lamps were the most economical and gave by far the best light at each desk, as was determined by illuminometer readings. A similar investigation has been made in Boston, where it was suggested that the room be lighted by lamps placed along the side walls just under the ceiling in boxes with prismatic glass bottoms, which would cast the rays into the room at the desired angle.—Scientific American.



Plan of a Public Sanitary, Brookline, Mass.
Alexis H. French, Engineer

Public Sanitary Station at Brookline, Mass.*

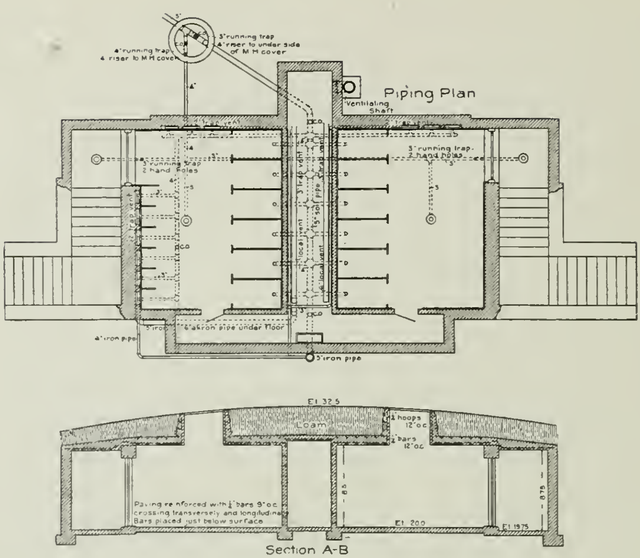
By ALEXIS H. FRENCH

THIS structure was built during 1909 and is located on public land in Village Square, through which several lines of street cars to and from Boston pass at the rate of one per minute in both directions during the rush hours. It is also located in the most densely settled part of the town, at the junction of several main avenues on which there is much teaming. The location would, therefore, seem to be as nearly ideal as anything of the sort could be in a town of about 27,000 population.

The details of the design are shown on the accompanying plan, by which it will be noted that a room 15 ft. by 18.5 ft. in dimensions, with six water closets, six urinals, two lavatories and a bubble drinking fountain is devoted to men, and a room of the same size containing six water closets, two lavatories, a bubble drinking fountain and a small retiring room is designed for women.

The structure is built of Portland cement concrete mixed in the proportion of 1 : 2½ : 5, reinforced as shown on the drawing. The floor on

*Read before the Sanitary Section of the Boston Society of Civil Engineers.



Plan of a Public Sanitary, Brookline, Mass.
Alexis H. French, Engineer

the men's side is placed 9 ft. below the walk, the ceiling is 8.5 ft. high and the roof covered with from 2 to 3 ft. of loam, the entrances and grading so designed as to render the sanitary as inconspicuous as possible. It will be noted that the entrances are designed with covered vestibules and right-angle turns in the staircases, thus securing the maximum of privacy.

The ground over and adjoining the sanitary has been planted with shrubbery.

The sanitary is well lighted during the day with six light shafts arranged as shown, in which are placed 2¾-in. Luxfer prism sidewalk lights spaced 4 in. on centers. During dull weather and at night it is lighted by electric lights controlled by suitably arranged switches.

The roof and walls are waterproofed by the application of a heavy coat of roofer's pitch and also with five layers of roofer's felt combined with hot pitch for a distance of 2 ft. below the roof and by the use of three layers of felt to a level of 4 ft. below the roof. No special precaution was taken to waterproof the bottom, as the level of ground water was much below that elevation.

On account of its non-absorbent character and freedom from stain, the gray Tennessee marble was used for the water closet partitions, urinal stalls and wainscoting, the height being 6½ ft. in the case of the water closets and 6 ft. elsewhere. White vitreous 3-in. by 3-in. by ½-in. tiles were used in the main rooms on account of their non-absorbent character and great durability.

A feature of the design which it is expected will work well in operation is the pipe chamber and passageway, in which are located the main soil pipe with its branches and cleanouts, the trap ventilation, water closet tanks and connections, ventilating fan and conduits, slop sink and space for the storage of supplies. Such pipes as are placed below the floor of the main rooms are made accessible by cleanouts with brass cleanout screws.

Brass floor drainers are placed in the vestibules and in the center of each main room, with waste pipes connected with the main drain below the main trap in the manhole, so that a stoppage of this trap will not cause the sewage to set back into the sanitary.

The type of water closet adopted is the "Sanitas Keystone," for the men's side, and the "Sanitas Keystone Hygic," for the women's side, both designed and made by the Sanitas Manufacturing Company of Boston. They are siphon jet closets and are especially well adapted for a public sanitary because of the form of the bowl and its rim, and the unusually large water area. The exterior of the closet is commendable from its simplicity and in that it does away with the space behind the bowl which too often serves as a hiding place for dirt. The closet is also provided with an unusually large local vent.

The water closets are so designed that each closet contains only a bowl and a push-button device for operating the tank in the adjoining pipe chamber, thus securing the maximum of simplicity and ease in obtaining cleanliness.

The urinals are also of the siphon jet pattern, made by the same company, and are substantially the same pattern that has been satisfactorily used at the South Terminal Station in Boston for ten years, modified to meet modern plumbing requirements. These also have a large local vent connected with a copper ventilation pipe placed in the wall behind the urinals and leading to the ventilating fan.

A system of ventilation has been adopted, but not yet installed, consisting of an electrically operated fan to be placed in the pipe chamber near the ventilation shaft, with ducts leading to each closet and urinal, so that the air in the sanitary can be exhausted through these fixtures at the rate of once in fifteen minutes. It is believed that this will be ample to keep the air good under the worst weather conditions.

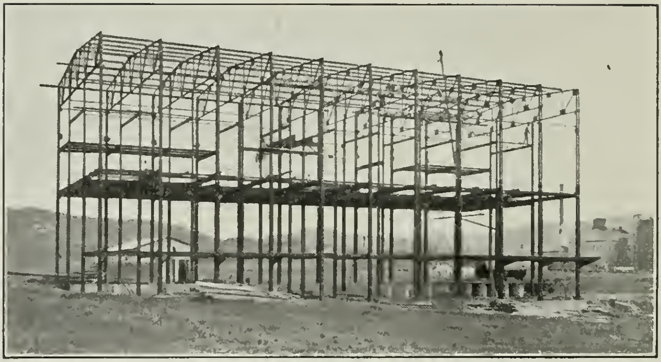
The building is heated from the hot-water system in the fire station plant, only 10 to 15 ft. away, and is designed on the basis of 1 sq. ft. of radiation for each 40 cu. ft. space to be warmed. In addition to this, a 9-ft. radiator is placed in each light shaft to aid in the warming and to keep the snow melted in winter.

* * *

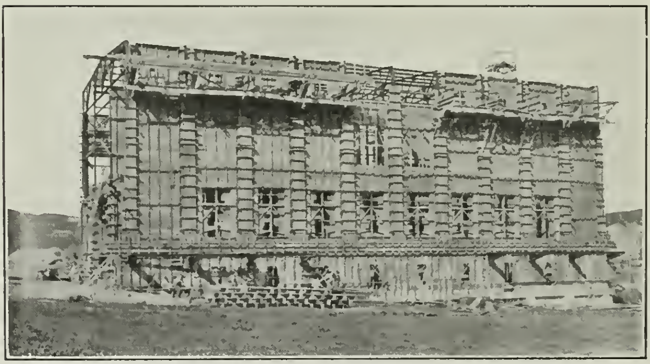
Blackboards of Concrete

One of the recent developments in the use of concrete is the concrete blackboard. For years chemists, plasterers and blackboard men have been working on the problem of how a black plastic board could be troweled to a smooth surface without producing a gloss, but without success. A liquid concrete finish has been perfected that when applied to the wall makes a blackboard that is said to be better than slate.

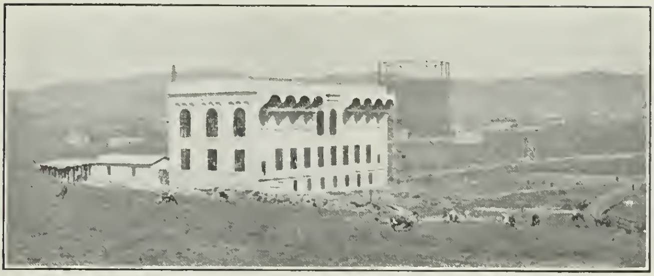
The foundation is concrete applied to an ordinary brick or wire lath wall, and is waterproof. The finish is a cement, and assimilates with the foundation. As the board can be applied either to brick or metal lath, it saves the rough cost of plaster specified where slate is to be installed. The surface of this board is smooth, consumes very little chalk, and eliminates to a great degree the dust, which is the worst problem to be contended with in the school room. A dead finish is produced, giving no reflection, making it possible to see this board from any angle of the room. As it is made on the wall, there are no joints or seams, which are unsanitary, no unprotected edges to chip off, and it is noiseless.



Steel Frame, Transforming Station, Visitacion, Cal.



Showing Concrete Forms in Place, Transforming Station at Visitacion, Cal.



View of the Completed Structure at Visitacion. Built in Forty-Eight Working Days.

Rapid Concrete Construction—Building a Transforming Station

By S. A. JUBB, C. E.*

THIS is a transforming station used in connection with the power development of the Stanislaus River by the Sierra and San Francisco Power Company, which company is to furnish power to the United Railroads.

The current is transformed from 104,000 volts, as received over the high tension line, to 12,000 volts for distribution. This is the highest voltage yet handled commercially, and required specially designed apparatus in the shape of transformers, insulators, oil switches, etc., for the safe and efficient handling of so large a voltage.

The station has a capacity of 30,000 horsepower and is arranged to be extended on either end to double its present capacity.

The erection of this station, exclusive of the steel frame, was taken under contract to be completed in 48 working days. The work was finished in 40 days, allowing for delays caused by the installation of the transformers which were placed and made ready of service as rapidly as a pit was completed. These transformers weigh about 35 tons each and special hoisting crane and transfer cars are provided to handle them. The present station has places for ten transformers, of which eight are to be in service at a time. Each transformer is enclosed on all but one side by reinforced concrete walls, forming a cell. The transformer rests upon rails and four wheels. Ring bolts are provided for attaching the moving apparatus, a depressed track is in front of the cells upon which operates the transfer car by means of which the transformers are moved from one cell to another for repairs or service.

A 28-foot diameter concrete cooling tank is provided outside of the building for the water used in cooling the transformers. Ample space is provided for circulating pumps, tanks for insulating oil, switchboards, repair shop, office and other conveniences.

The two end walls of the station were constructed of metal lath and cement plaster inside and out, with the idea that they would be removed when the station was extended to increase its capacity.

*Mr. Jubb is engineer and secretary of the E. D. Cowley Building Company, contractors for the building described herewith. The same company has under construction a central power plant at Mare Island for the U. S. Government.

Paint for Iron and Steel*

By FRANK NEAL

IRON and steel paints have been the subject of some scientific study by both the consumer and paint manufacturer, but I am inclined at times to believe that very little is actually known yet as to what really is the best coating for iron. Without trying to review all the scientific work that has been done along this line, with which you are doubtless familiar, I will try to give you briefly some results of our own practical experience as paint manufacturers.

The old claim that linseed oil is the life of paint does not necessarily apply when we are considering iron coating. While linseed oil is a necessary ingredient, other elements are equally important, namely, the pigment to be used and some other vehicle to offset certain characteristics of the oil. In painting on wood we have a more or less absorbent surface, depending on the wood that is used, but on iron the paint has no absorbing surface into which the oil can penetrate and bind. The oil must make its own bond in such a way as to form a thin, even coating not easily marred or scraped off. This cannot be done by the use of linseed oil alone. I have in mind the specification of a large railroad in this country that was drawn up by a very eminent chemist. The pigment was composed of 45 per cent carbonate of lead and 55 per cent pure carbon lampblack, and the vehicle was composed of about 90 per cent linseed oil balance dryer. The specification called for not in excess of 15 per cent pigment and 85 per cent vehicle in the total. This paint was designed for use on steel freight cars. You know what extreme conditions these cars are submitted to and what the paint must stand if it has any protective value. Now I have made quite a number of carloads of this paint and naturally wished to know what it would do, so I made tests and, while this paint costs the railroad company about $1 per gallon, I have tested it against different paints which they could buy for not in excess of 75 cents per gallon that have proven vastly superior to it.

On several occasions I have gone into large buildings in course of construction for the purpose of examining the steel which was being erected and have found it coated with a film of oil paint which under a slight pressure of the finger could be shoved completely off the surface. Such paint is totally unfit for the purpose for which it is designed. I have often wondered that a great many more fatal accidents do not occur, owing to the slippery condition of this paint film under the feet of the man, sometimes many stories up in the air and mighty little between him and his Maker if he slips on this kind of paint. I wish to impress upon you that in buying paint for structural work great care should be exercised in selecting an article that will produce a film that will be firm under the feet of the man that you send away up in the air to erect the steel.

At Atlantic City the Society for Testing Materials is conducting a series of tests in connection with the United States government and the Paint Manufacturers' Association. These tests, while of importance, are not of much commercial value, for they are all made with practically one binding liquid and that raw linseed oil. It seems to me that in order to get results of practical value we must experiment not only on what pigments shall be used, but what vehicle or combination of vehicles, together with what pigments, produce the best paint for iron or steel.

*Read before the Detroit Engineering Society.

About twelve years ago we had erected at our factory a large steel tank for linseed oil storage. At that time great claims were being made for graphite as a steel protective coating. Not very much was known at that time about painting iron, and we knew as little as any one else. It was decided to paint the tank with graphite, which was done, but it was black and all our buildings at that time were white. So in order to make it look right we put on three coats of white over the graphite. The following year we erected another tank of the same kind. When it came time to paint it we examined the old tank and were greatly surprised to find innumerable small blisters all over it which, when punctured, were found to be full of water, and the tank was very badly pitted. In order to save the tank it was necessary to remove every bit of that paint and clean the surface of rust, which was done at once. Then the problem of paint again arose. Another pigment had been discovered which was said to be a very fine preservative. This article was made up into paint of the accepted form and applied to the new tank. As a comparison we used for the old tank a mixture of red lead, linseed oil and turpentine. Before deciding on the proportions of this last formula, I made several experiments to determine just how much oil red lead would solidify. After determining this I found that something more was needed as a thinner. I decided, however, not to add more oil for a thinner, as would ordinarily be done. I decided that the thinner, to make a paint suitable for spreading, should be one that would evaporate, leaving the lead and oil to form their natural chemical compound, which is a cement almost as impervious to water as a combination of litharge and glycerine. This paint we applied to our old tank, and then both tanks were coated with three coats of white to conform to our buildings. Since that time we have erected several other tanks, and in every case they have been coated with this red lead paint. The old tank which has been painted now over ten years was in good shape four years ago. We repainted it and all of our buildings, changing the color from white to brown, on account of the smoke which is so prevalent in Detroit where life is worth living. It is still in good shape. On the other hand, our second tank was found to be in bad condition four years ago, and we had to remove all the old paint. While the paint on this second tank had been on for seven years, the undercoat was still an imperfect, undried film, and easily peeled off to the iron as described above.

Now, gentlemen, I do not wish you to get the impression that I think red lead is the only pigment for the protection of iron. The combination which I have described, unless protected by another pigment and more oil, will not stand up at all well as a final coat. When properly protected, however, it will be found to give excellent results. Neither do I wish you to get a wrong impression as to my attitude regarding the use of linseed oil as a protective coating for iron. Linseed oil is one of our best friends in the paint trade as a vehicle or distributor of pigments for its protective qualities, and as a binder of the pigment to the surface to which it is being applied. But there is such a thing as getting too much linseed oil on iron, and when we do the end we have in view is defeated and we have an improper combination which the slightest bruise knocks off, exposing our iron to the ravages of the elements. Linseed oil under proper conditions will absorb oxygen trom the air or from pigments with which it is mixed, forming a practically insoluble compound linoxin. If this linoxin has a sufficient amount of insoluble pigments in with it, we have something which, while not everlasting, is fairly satisfactory.

Now let us go a step further on the subject of linseed oil. This article, as it comes on the market today, seldom if ever has a chance to settle and age. As a result it is bound to have more or less soluble glutinous matter in its composition, which remains in it and goes into the paint, thus weakening the paint film to a greater or less extent. On the other hand, the progressive manufacturer takes a well-clarified oil and by the use of chemicals and heat all of these impurities are driven off and he has left only the valuable part of the oil which, when combined with proper pigments, produces a paint which is very much less susceptible to the ravages of the elements than the raw oil similarly combined.

I have known many cases where an oil, prepared as I have described, and thinned with one-half of that much-despised naphtha, has outworn the pure, raw linseed oil, both being mixed with the same amount and kind of pigment. Then, again, we have had good success in painting iron and steel with paint into which different proportions of hard fossil gums have been incorporated. We have also had some little success in the use of resin oil in connection with linseed oil, but only to a limited extent. So we always return to our oldest friend, linseed oil, whether it be in the raw form of commerce or scientifically treated. Without a doubt it stands supreme to date when properly handled.

And now, gentlemen, to sum it all up, the best iron and steel paint I have been able to produce or have seen consists of linseed oil in connection with almost any pigment, providing enough volatile liquid is used to prevent the application of too much oil on to a non-absorbent surface. The point is that too much oil skins over on the surface so that the oil cannot absorb enough oxygen from the air to enable it to become that almost insoluble compound linoxin. Our experience has been and is today that in the painting of anything the oil, properly handled, restricted or supplemented where necessary, is the life of the paint. On certain woods too much oil cannot be used in the priming coat. On other wood the more oil used the worse the result. Some wood contains sap or resin to such an extent that it repels the oil, causing it all to lie upon the surface, forming no bond, and when aftercoats are applied which are less elastic, owing to their having more pigment in their composition, the expansion under heat or contraction from cold will cause this paint to peel or crack badly.

Painting on iron is somewhat similar to painting on sappy or resinous wood. In order to get satisfactory results the least possible amount of oil should be used in the priming coat, gradually increasing the percentage of oil and decreasing the percentage of pigment in succeeding coats, absolutely the reverse of what you would do were you painting white pine.

* * *

Portland Cement in Washington and Oregon

[From U. S. Geological Survey Bulletin]

A VERY large amount of Portland cement is used in Oregon and Washington for concrete construction, especially in the larger cities—Portland, Seattle, Tacoma, etc. Much of the material is imported from Germany, Belgium, England, and Japan, and a small amount is brought by water from California. Its cost reached $3.75 a barrel during 1907, but averaged $3.00. It is estimated that the total amount of cement used in the three cities above mentioned in 1907 was 1,294,800 barrels, with a value of about $3,884,400. Of this amount 381,356 barrels were imported into Portland and 369,516 barrels into Puget Sound ports. The latter region also received 263,458 barrels from domestic sources, about two-thirds from California. Several companies have recently been projected for producing cement at various localities in Oregon and Washington, but the only plant now existing is that of the Washington Cement Company at Concrete, a station on a branch of the Great Northern Railway in central Skagit County. The plant was built in 1905 and started in 1907. It has two 100-foot rotary kilns, but will soon add others to the full capacity of the water power, which is derived from the Baker River, on the bank of which the works are erected. A 6 by 10 foot flume carries the water about 2½ miles to the works. Crude oil is used for the kilns and driers. A large supply of high-class limestone is obtained from quarries near by and clay is excavated from the river banks.

The following analysis of the cement was furnished by the company:

Silica	23.96
Iron oxide	3.16
Alumina	6.98
Lime	62.76
Magnesia	1.58
Sulphur as SO_3	1.31

Ninety-nine per cent of the cement will pass through a 100-mesh screen and 83 per cent through a 200-mesh screen. The setting time is given at 4½ hours for initial set and 8 hours for final set. The tensile strength is given as follows: Twenty-four hours, neat cement, 295 pounds; seven days, neat cement, 773 pounds; seven days, 1 to 3 sand, 276 pounds; twenty-eight days, neat cement, 805 pounds; and twenty-eight days, 1 to 3 sand, 440 pounds. The boiling test gave perfect results. This cement has been extensively tested and several contractors in Seattle assert that it comes up to the best requirements.

From 1887 to 1890 a cement plant was operated at Oregon City by the Portland Cement Company, of Portland, Ore. This plant was the first to use rotary kilns. A "natural cement rock" from Douglas County, Ore., was burnt, using gas for fuel, and power from Willamette River. Owing to litigation it was shut down in 1890. Undoubtedly the great expense of hauling limestone from Douglas County was a serious handicap to the project.

* * *

Laying Hardwood Floors

There is a certain amount of art in doing everything well, even to laying hardwood floors, which some operators do not consider in this light. The popularity of the hardwood floor, with its many possibilities as a decorative floor covering, can be stimulated and made so much more pleasing by the addition of painstaking on the part of the finisher, says Warfield Webb in the National Builder. Simply laying a hardwood floor is one of the least considerations in connection with the undertaking. It is essential to have the foundation perfect, and the floor must be laid with care and neatness, but the job does not end here, because the finish is very important to a fine piece of work.

The average hardwood floor, unless it is of mosaic, and even then it cannot be perfect, must be planed off and sandpapered and rubbed with considerable care to insure a job that will be acceptable by one who is a capable judge. If there has been a good foundation to begin with and if the floor has been laid with care in matching the grooves and tongues, and the nailing has been done with the idea in view of making the work passable, then there will be less to do with the scraper and sandpaper. These first considerations are not always adhered to, however, and to neglect them means more labor and trouble, and in the end a job that is not altogether satisfactory.

Fifty Years from Now in the Pathfinder

THE Washington Star, like a number of aged newspapers, is publishing in its current issues extracts taken from its columns of half a century ago. Some of these extracts are quite quaint, to say the least. One of our contributors, Mr. F. W. Fitzgerald, the well-known author of "Life in the Mission Field," has been amused by this idea of republishing the news of fifty years ago, and contributes the following items from the Pathfinder of 1960, which we believe will be amply instructive:

Last night's storm interfered so seriously with our tele-photo currents that we are unable to give our subscribers the promised views of yesterday's inaugural ceremonies at St. Petersburg, when Russia's third president, Mr. Andrae Kcirtapztif, was solemnly inducted into that high office. We confidently expect to have these views in good shape for tomorrow's 10 o'clock edition.

At the emperor's levee this morning there were more notables than usual. Grand Duke Morgan III of New York made the presentations, and Prince Philip of Chicago led the guests to the dejeuner that followed. The Armours have always shown the greatest skill in dietary matters, particularly the providing of the highest grade of meats and their by-products, and Prince Philip splendidly sustains the family's reputation.

The Count of Detroit's aero-motor collided with the Berlin express last night, just past midnight, right over the city of Quebec. No one was injured and repairs were quickly made by the New York Aero Company without either machine's having to alight. Only a slight delay was occasioned to the Berlin express, and the count's machine went on its way to Pearyville, the count's new summer home, just west of the north pole.

This morning's discobobulous race was most interesting. Of course it goes without saying that the emperor's pet discobobulous won by a wide margin. "Pinchot" is indeed a splendid animal and was handled magnificently. It is rather wonderful that this comparatively new three-legged animal should have developed such extraordinary running qualities. It was only introduced into this country about fifty years ago by the present emperor's great-grandfather, who discovered it in Africa and brought six with him just before his third election as president, six years before he became dictator and ten before his assuming the title of Emperor Theodore I.

The British ambassador and the ambassador from the republic of Japan are having a week's shooting as guests at the emperor's new shooting lodge at Port Nelson. His grace's great-great-grandfather was British commander of this old port on the Hudson bay when Canada was a British possession, years ago.

It is just twenty-five years today since the Pathfinder absorbed the last of its local contemporaries. The Star was a much run-down paper at that time, but had some valuable franchises and grants from the crown that made its possession desirable. So the property and rights and plant were purchased at auction and merged into the Pathfinder, which had already absorbed the other five newspapers that had been making a more or less precarious living trying to keep up with the standards that had even then been established by the Pathfinder.

* * *

A young man lived at some distance from his bride-elect. On the eventful day he set off for the station in good time, but, being delayed by friends, he missed his train. Then he bethought himself of the telegraph. "Don't marry till I come—William!" was the message he wired.

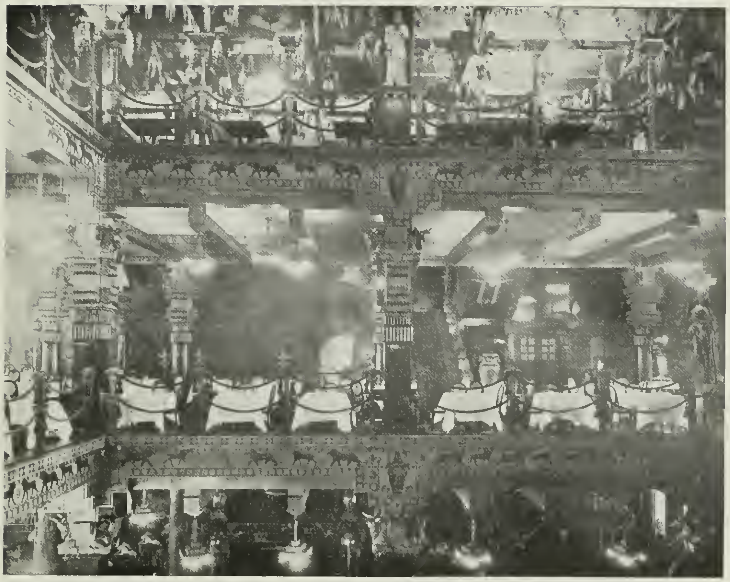


Fig. 1.—The Court

The Café de l'Opéra, New York City

The Most Magnificently Furnished and Decorated Café in the World

[From The Illuminating Engineer]

NEW YORK CITY has claimed many distinctions, the latest of which is perhaps rather characteristically American—at least it is expressed in a phrase that can hardly be called good "English"—namely, "the eatingist place in the world." With its cosmopolitan character it is possible to eat publicly, in every language of the globe, metaphorically speaking, except good, plain United States; for in all its innumerable restaurants and hotels of high and low degree there is not a single one in which is served a genuine Yankee meal. While Italians, French, Germans, Hungarians, Assyrians and the rest of the foreigners can find plenty of tables set exactly as they would be in their own country, the American must be content with at most a French version of the dishes which are indigenous to his native land.

The fashionable and spectacular café naturally follows the theatre in its location; hence Times Square, which now probably includes within the radius of a half dozen blocks more theatres than exist in any other equal amount of space in the world, is the chief location of this class of eating establishment. The latest addition to this collection is the Café de l'Opéra, which occupies an entire building running from Broadway to Seventh avenue, and seven stories in height. The building was originally a hotel,

Fig. 2.—Moin Floor, Showing One of the Massive Chandeliers

Fig. 3.—Second Floor, Showing Electroliers as the Babylonions Might Hove Designed Them

Fig. 4.—Grill Room, Showing Veranda Effect

and was built in the days when gingerbread architecture was the prevailing mode. This particular school of architecture, with which the name Eastlake was connected, was the apotheosis of the adage that "beauty is only skin deep," the decorative features consisting of the most superficial and meaningless tracery of carving. To convert this into the massiveness characteristic of Babylonian times without entirely rebuilding was a feat which might well test the powers of any but an architectural genius. But the thing has been done with consummate skill, to the lasting credit of the architect and designer, Mr. Henry Erkins.

The interior decoration and furnishing have been carried out absolutely regardless of expense. The chief feature of the decoration is the celebrated painting, "The Fall of Babylon," by George Roschergrosse, which covers a canvas some 30 feet square, and, we understand, was purchased at a cost of $50,000; while single pieces of Turkish drapery cost as much as $30,000.

A central court was opened in the building extending through three floors. The walls on one side of this are entirely of mirror, thus apparently doubling the size of the court and the surrounding rooms. A view of this court is shown in Fig. 1.

Fig. 2 is a view on the first floor showing a massive chandelier in the upper right hand corner.

Fig. 3 is a view on the second floor showing the special lighting fixtures, each of which is equipped with round frosted lamps.

Fig. 4 is a view in the grill room in the basement. The walls are painted to represent a landscape and are lighted with concealed Linolite lamps giving the effect of an open veranda.

Reinforced Concrete for Farm Buildings—Showing High Foundation Walls and Floor Drainage Arrangement

Showing Center Aisle of Stable. Note Convenient Arrangement for Feeding

The Use of Concrete in Farm Buildings from a Sanitary Standpoint*

By S. CUNNINGHAM, JR., Architect, New York City

THE requirements for sanitary construction of farm buildings make concrete and cement the most useful material for floors and walls and even for roofs and ceilings when expense does not prohibit its use. Most boards of health which undertake to regulate the production of milk sold under jurisdiction require or advise the use of cement for floors in cow stables and specify also that the walls and ceilings must be tight, clean, and free from dust-catching surfaces, which evidently suggests the use of cement or hard plaster finishes. At present stables are usually built of wood, but concrete in blocks, or cast in forms, is being used more each year and there are already a large number of barns scattered throughout the country which show in a highly developed way the best uses of concrete. The fireproof and permanent qualities of this material are powerful inducements of themselves toward its use. The ease with which it may be kept clean, the good health of the animals stabled therein, and the possibility of producing clean milk with a minimum of labor, increase the weight of argument in its behalf.

For floors concrete shows practically no wear from use; it is water-tight, non-absorbent and sanitary, and if sufficient bedding is used it makes a satisfactory material for animals to stand and lie upon. When the floor is upon earth fill, it is advisable to put a layer of sand 6 inches or more thick under it, especially in damp locations, and to place under the stalls themselves a waterproofing layer, easily made by putting down two or three layers of tar paper on a base of cement, brushing it well with coal tar pitch. This prevents dampness from drawing up through the concrete and makes a warmer floor. The waterproofing should be covered with a thickness of concrete and cement surfacing of at least 3 inches for cow stalls and 4 inches for horse stalls. It is possible to use less than this for cow stalls (but not advisable in horse stalls), by putting down metal lath over the waterproofing, nailing through to the concrete beneath, to hold the lath firm, then plastering the lath with a heavy coat of cement mortar mixed 1 to 2, 1 inch thick, or more. All stall surfaces and passages to be used by animals should be left rough, finished with a wooden float, or a float covered with carpet.

Many farmers are prejudiced against a cement floor; they think it cold, causing stiffness and rheumatism in stock and udder troubles in cows. If sufficient bedding is used this objection is removed. The good points of a concrete floor outweigh all supposed disadvantages. If a wooden surface is preferred for the stalls a platform may be made of 2-inch oak, chestnut, or spruce, creosoted to prevent absorption. The platform should be built in sections, one or two for each stall, set in a pan formed of cement so as to be readily removable for cleaning or renewal. An excellent floor may be made of the creosoted wood paving blocks, such as are used for street paving. They are about 3 inches thick and set with the grain vertical on a concrete base and hot asphalt poured on to fill all cracks. Asphalt softens less from animal heat than coal tar pitch and does not work out of the joints to stick to the hide of the animals. There are some special floors that are good. Asphalt mixed with granulated cork in a layer about three-quarters of an inch thick makes a floor that is warm and gives a good foothold. Many of the patent

*Paper read before the Convention of the National Association of Cement Users. Illustrations by courtesy of Pacific Portland Cement Company.

floors are either cold or those made with a mixture of sawdust absorb and swell and come up from the concrete base.

The feed mangers in front of the cow stalls should be low and of just sufficient depth also to allow of watering the cows. Six inches is deep enough. Watering in this way at regular periods has been proved the best for cows. They drink more, and at more suitable intervals than when they have water always before them in individual drinking pots, which, besides, are very difficult to keep clean. It is often impossible to turn a large herd out to water from a trough in the yard and the continuous manger into which water may be admitted from a large hydrant forms an easy and cleanly method of watering. The water being shallow and the mangers the temperature of the stable, the chill is taken off the water even in severe weather, while the water in a yard trough, unless special means are taken to warm it, is often too cold for the cows to drink deeply. The low mangers offer the advantage of feeding practically on the floor.

All feed passages, mangers and gutters should have a smooth, hard troweled finish as they are easier to keep clean than a float finish.

Cement partitions have been used between stalls both for cows and horses, but iron pipe cow stalls are better, with metal stanchions to confine the animals. For horse stalls, partitions built with iron posts and ramps and 2-inch by 8-inch yellow pine slats, separated about one inch, are very stiff and give good ventilation, making them cool in summer. Horse stall floors should be treated as for cow stalls. They should pitch about two inches toward the gutter. The gutter in this case should be very shallow, not over 1½ inches deep, 16 inches wide, and uncovered. There will be more wear on horse stall floors, so they should be laid more carefully with this in view.

Where the floors join the walls, and in fact all interior angles in the stable, should be coved or rounded on a 3-inch radius to prevent corners for the collection of dirt. A small detail, but one that makes a great difference in the cleanliness of a stable.

Concrete in many forms has been used for walls. The object to be attained is a hard, smooth wall surface insulated as well as possible from changes of external temperature. It is, of course, not difficult to prevent moisture coming through the outside, but condensation of moisture inside is more difficult to avoid. Concrete blocks with air spaces, cored reinforced walls, and solid walls, furred with wood or metal and finished with plaster on metal lath, or lined with plastered partition tile or concrete blocks with a space between the two walls, are methods used for insulation. Dampness in a stable is very often a sign of poor ventilation. A cow gives off from the lungs and skin from 8 to 10 pounds of water per 24 hours, which must be removed to prevent the air becoming saturated. In such an event if the wall surfaces are but slightly colder than the dew point or condensation temperature, water will form on them and under bad conditions they will be dripping. Fortunately the amount of air required for healthful condition of breathing is in excess of that necessary to remove the moisture except in certain conditions. When warm, moist weather succeeds much colder temperature, the walls do not respond immediately and condensation occurs. If the air space in the walls is filled with chopped straw, sawdust, or planer chips, the insulation is improved. In wooden frame structures with inner walls of hard plaster on lath, condensation takes place unless the walls between the studs are filled as above noted and even smooth wooden sheathing painted or varnished will be moist, though it is

Farm Building at Cement, Cal., Showing Concrete Floor

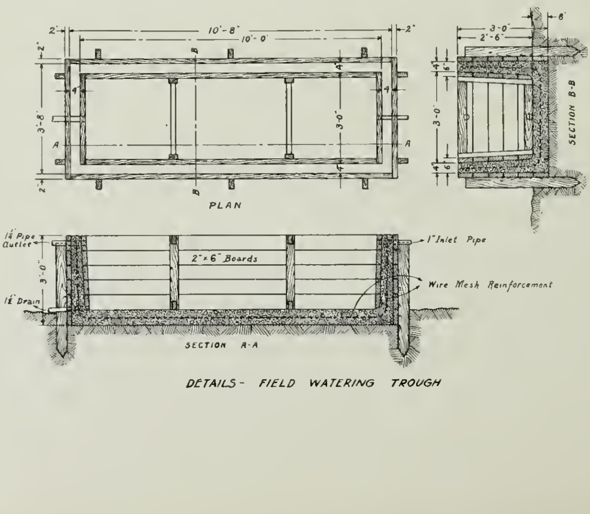
not so apparent. The objection, then, is not one that holds against concrete alone.

This subject of ventilation is very important and definite means should be provided to insure a proper circulation of air. The old farm buildings which were scarcely more than rough sheds were full of cracks through which the air could pass. Modern concrete barns leave no such chances for haphazard ventilation and with forty cows in a barn of 20,000 cubic feet capacity, each cow requiring five or six times the amount of air necessary for a man, the ventilation must be positive and adequate to make the conditions healthful. It has been the usual experience, where condensation was taking place, it could often be proved by actual test that the circulation of air was insufficient for the health of the animals, due to the ventilators being kept closed. There are several good systems of natural ventilation and no barn should be constructed without one of these, or other proper means to supply fresh air. In northern climates the barns should be made small, about 500 or 600 cubic feet capacity per animal is about right. Such a building is easier to keep warm and yet is large enough to allow of proper ventilation without causing severe draughts. The ventilating flues may be built of concrete, tall enough to act on the principle of a chimney and to cause circulation by difference in weight of the column of warm air within and cold air outside.

For piggeries the use of cement in construction is as advisable as for stables. They are much more likely to be neglected and allowed to become foul and a cement finish is so easily washed down that there is no excuse for any such condition. Pigs are liable to contagious diseases and a building that can be hosed out and disinfected and having no absorbent materials or cracks to harbor bacteria can be used again with no danger of the infection spreading. This applies as well to cow stables.

Concrete Watering Trough at Cement, Cal.

Almost all large milk farms depend in a great degree on ensilage for feed. A cement silo is equal to the best that can be built for storing ensilage. The proper preservation of ensilage depends on keeping it packed tight to exclude the air, with smooth walls, so that as the ensilage settles it does not loosen at the walls to admit air there. Structurally, cement silos are practically everlasting. The acids existing in the fermented juice of the corn attack the surface to a very slight degree only, and cement walls, either solid or cored, prevent the freezing of ensilage better than a wooden stave silo, the form most commonly used. The freezing not only spoils that part of the ensilage lying within a few inches of the wall, but by causing the frozen ensilage to cling to the wall, the even settlement is interfered with and part of the rest spoiled by the admission of air.



DETAILS - FIELD WATERING TROUGH

For poultry houses concrete makes a warm, tight building that will exclude rats and other animals preying on chickens, and that can be kept clean for the prevention of lice. The floors in laying house pens should be made 6 inches below the level of the door sills and filled with cut straw or gravel for scratching. This can be renewed as often as necessary to keep them clean.

When manure is stored and not spread on the fields as soon as produced, a tight pit, covered or uncovered, is necessary to prevent the leaching away by the weather of the soluble parts of the manure, which are the most valuable as fertilizer. Concrete offers an excellent material of which to construct such pits. The floors may be pitched to a sump pit in one corner and the liquid pumped out and applied to the fields, using a sprinkling cart for this purpose.

The production of clean milk requires the best sanitary conditions in the buildings in which the milk is handled, as well as in the cow stable where it is produced. The extensive use of concrete floors and smooth plastered walls with coves in all angles will make such a dairy easy to keep clean, but offers no particular requirements in the way of sanitary design. In this connection, however, it has been found that wooden soled shoes offer a much better way of keeping the feet of the workers dry and warm than do rubber, which are heavy, unhealthful and wear out quickly on the concrete floors. The use of live steam and hot water from hose bibbs offers an increased advantage in keeping such buildings clean and sterile.

For greenhouses, hotbeds, and wherever wood in contact with earth has been found to rot out, concrete has been substituted with the expected advantages. Tables in greenhouses can be easily designed and built of it, making them permanent and avoiding a large item of expense in renewals. No objection has been discovered to its use in this way from any unfavorable action on the plant life. In fact, it forms a better protection than wood from possible variations of temperature.

The fact that concrete can be kept clean more easily than any other material in common use is its greatest recommendation for its use in farm buildings. The realization that health to a very great degree depends on cleanliness is as true for farm stock as it is for mankind. Good laboring help is difficult to obtain on most farms and anything that contributes to the reduction of labor necessary to keep the surroundings clean is bound to grow rapidly in favor on that score alone, especially since no valid objections to its use can be substantiated in connection with stock or farm products.

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Impediments

A commuter hired a Swedish carpenter to repair some blinds on the outside of his house. During the day the commuter's wife looked after things, and once or twice came out to see if the man was getting on all right.

"Is there anything you need, Mr. Swenson?" she asked, on her second trip.

The carpenter gulped once or twice, but made no reply. The lady repeated the question.

Again a gulp and no answer.

"Why don't you answer me, sir?" said the lady, indignantly.

The Swede turned and looked down at her gravely.

"My mout is full of screws," he said. "I can not speag undil I svaller some!"—New York Times.

How to Decorate a Church

By WILLIAM A. LAY, Decorator

MUCH has been said and many articles are written in our magazines and architectural journals about interior decorations in our homes. Especially is this true of the magazines. One can scarcely pick up a number but an article on "Interior Decoration" is given more or less prominence, in which the latest fads and sometimes freaks are discussed. But we seldom, if ever, read anything from an actual decorator on church decorating.

We wish to present a few thoughts on this subject. Our reference to decoration in this connection is intended mainly to apply to the decorations of the walls and ceilings of the places of worship, and such decorations and furnishings as may be closely connected with them.

Ecclesiastical mural decorations, we believe, have always, from the times of the earliest Assyrians, at the time of Babylon, and afterwards in the Egyptian temples, given the artist the largest scope to produce that which was intended to convey the spirit of worship and religious belief of the time, by the use of a decorative scheme pleasing both in design and color.

Thus we find the distinctive styles of the several ages and periods, as applied to both architecture and decoration peculiar to the religious faith of the time.

Coming down to our own time and age, we realize that our morals are materially influenced by our arts. Good taste not only refines, but reforms, and in no way can we better display or outwardly show the higher ideals possible than in the architecture and decoration of the temples of worship, and in no places are the styles better preserved.

The beautiful and tasteful appearance of the inside of the church building will sometimes impress those upon whom the more solemn features of religion at first have but little effect.

The first rule in decorating a church (or any other building) should be to work in harmony with its architectural features; for if this rule be lost sight of the most costly and lavish decorations would only emphasize the failure.

Only such decorations as are suited to that particular church building should be used. The church walls should look "churchy" and not theatrical, but should impress one with a feeling of reverence and veneration.

There should be exclusiveness and individuality in design and color not found in any other edifice. A pure taste elevates everything that it touches and which touches everything within the magic circle of its power, there is nothing too high for its influence or too low for its sway.

The church walls and ceilings require as much richness of color as any other interior; the surfaces to be covered are on a larger and grander scale, and light is diffused in proportion to the increased space. In no other interior should the color effects be studied more or are they more difficult to handle than in a church, because of the peculiar and varying light and color effects produced by the stained glass of the windows.

Color therefore rather than design is of most importance. If we inspect the works of nature closely, we shall find that they have no uniform tint, however uniform its color may appear at a distance, it will, when examined closely, be found composed of a variety of tints and shades. So in the church, therefore, skill and intelligence must be shown to produce a pleasing restful harmony.

Certain places should be made prominent by the use of appropriate ornamentation, but the light, spidery treatment of smaller interiors finds no place here. Ecclesiastical decorations, though rich, should be quiet and symbolical in their nature, let everything mean something; there is, at the same time, more danger in the excessive use of symbols, mottoes, etc., than in a happy blending of tints and designs which tend to unite the architecture and reveal its best features.

It is at this point that the church decorator is needed, where religion and art join hands, as it were, and when the artist must have a knowledge of the requirements of that particular denomination for which the work is done. So that whether the decorations are for a synagogue, with its embellishments in Moorish or Alhambra, or like St. Peter's in Rome, with its decorations and holy pictures that can only be painted by an artist whose whole soul is in the work, or the decorations of St. Paul's in London, beautifully symbolical and full of meaning, or the noble architectural lines of a Westminster Abbey, or the more modern conception of our American churches, or for the unassuming little country chapel, should be all the same to such a decorator. He should be familiar with the requirements of each. He enlists the highest instincts of the finer nature, he produces harmony, power and originality in design, beauty of detail, and we believe reverence for the sanctuary.—Southern Architect.

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Remarkable Church Roof

Reinforced concrete construction is gaining favor with architects for the construction of church roofs, the principal advantages being the practicability of constructing large barrel and domical roofs without unsightly trusses, tie-rods, etc., and the low cost of upkeep. An interesting example of this form of roof, and one of the first to be constructed throughout of reinforced concrete, is that of St. Aloysius Roman Catholic Church, Glasgow.

In plan the church is of the usual cruciform shape, and the building is faced with red freestone in the classic style, the reinforced concrete work being carried on the main walls. The roofs over the nave, transepts and apse are in the form of semi-circular arches, the nave roof having a clear span of 44 feet 6 inches and a length of 65 feet. The nave roof is supported on arch ribs, reinforced in such a manner as to take the whole of the stress due to thrust without putting any thrust on the side walls, where the load is vertical. The ribs carry a 4½-inch slab forming the roof covering, this slab being reinforced with expanded steel. There are two four-light cupolas in this roof. These act also as ventilators. The roofs over the transepts and apse are of somewhat similar construction, but of small span. Three of the main arches carrying the large central dome are of brickwork. The central dome, which is 44 feet by 34 feet 3 inches, has a radius of 29 feet 6 inches for the first portion and a radius of 21 feet for the upper portion or dome proper. There are eight large lights in this dome. The concrete in the dome is generally 9 inches thick throughout, reinforced with expanded steel and circumferencial round steel rod rings.

Machine vs. Hand-Mixed Concrete

By C. W. GAYLORD, C. E.

YOU want to know the inside facts—not guess work—nor along general conclusions, but the process step by step in the mixing of concrete as you would take it in your every day work.

Every worker in concrete will appreciate the comparison which we make between the two processes—hand-mixing, against machine mixing—and as a business proposition the question is not so much whether you can afford to buy a mixer, but rather whether you can afford not to buy one.

To be thoroughly understood, an analysis is made of the different operations, which must be performed in mixing concrete, to determine:

(a)—Which method is cheapest.
(b)—Which method gets the best results.

To mix concrete the following operations must be gone through, regardless of the means of mixing:

(1)—Materials must be loaded into some means of conveyance.
(2)—Materials must be transported to place of mixing.
(3)—Materials must be measured to obtain proper proportion.
(4)—The materials must be mixed together.
(5)—The finished concrete must be loaded into some conveyor for transportation.
(6)—The concrete must be transported, spread and rammed into place.

In addition to the above in the consideration of cost there must be included the item of attending to the water, the supervision and cost of plant.

It is the contractor combining the above operations into the fewest moves that is the most successful. The use of a mixer of the type of the Miracle Positive Feed Mixer absolutely combines items (3) and (4), and, under intelligent use, practically reduces items (2) and (5) to nothing. Take a comparison of cost of hand and machine mixing with careful analysis of the above conditions.

Actual cost of hand mixing of concrete under favorable conditions in Riverside, Cal., during 1909. Concrete placed in six-inch wall. Labor, efficient and experienced. The crew consisted of:

Foreman	$ 3.00	per day
Two men at $2.25	4.50	"
Eight men at $2.00	16.00	"
Total	$23.50	per day.

This crew averaged twelve batches of concrete per nine-hour day, each batch containing 1.7 cubic yards, or 20.4 cubic yards per day. The material handled was:

84 Sacks cement;
9.8 Cubic yards sand;
19.6 Cubic yards stone, 1½ inches and under.

This is over two cubic yards, per man, per nine-hour day, of finished concrete, including all work except forms. The average given by most authorities is from 1¼ to 1¾ cubic yards per man, per ten-hour day. This shows the ability and efficiency of this foreman and crew, and proves this to be a very pertinent case to compare with machine mixing.

The cost of mixing and placing, per cubic yard, was $23.50 divided by 20.4 equals—$1.15 per cubic yard.

This was divided into the respective operations as follows:

(1)—Loading on wheelbarrows:	
Sand, .46 cu. yds. at 10c per yd	$0.05
Stone, .92 cu. yds. at 15c per yd	.14
(2-3)—Wheeling to mixing board and dumping in measuring box:	
Cement (all handling)	.04
Sand, average haul 30 ft	.02
Stone, average haul 50 ft	.05
(4)—a) Mixing sand and cement, 2 turning	.12
b) Mixing mortar with stone, 3 turnings	.27
(5)—Loading concrete into wheelbarrows	.17
(6)—a) Wheeling to place, average haul 55 ft	.06
b) Dumping, spreading and ramming	.11
(7)—a) Supervision, ⅓ of foreman's time charged in above items	.10
b) Care for water	.02
	$1.15
To this must be added the cost of the mixing boards, 2 of which were necessary, and which lasted for about 500 cu. yds. before becoming so rough that it was cheaper to replace them.	
2 16 ft. by 16 ft. boards, 500 B. M. at $40.00 per 1000 B. M. for lumber and making, $20.00; $20.00 divided by 500	.04
Total cost of 1 cu. yd	$1.19

Under exactly similar conditions, the cost of one cubic yard for machine mixed concrete would be as follows:

(Note—The same names are given to the various items for clarity, although slightly different operations are performed, as noted.)

(1)—Loading on wheelbarrows:		
Sand		$0.05
Stone*		.14
(2-3)—Wheeling to mixing board and dumping in measuring boxes:		
Cement		.04
Sand		.02
Stone*		.00
(4)—a) Mixing sand and cement		.09
b) Mixing stone with mortar		.00
		.34
Note—This is made up as follows:		
One man handling mixer, dumping concrete, tending water, etc., at $3.00 per day.		
Estimated number cu. yds. per day, average, 40 cu. yds.		
Cost of mixing per cu. yd.:		
Labor, $3.00 divided by 40	.075	
Gasoline, per cu. yd	.015	
	.09	
(5)—Loading concrete into wheelbarrows		.02
No shoveling here, just pulling a lever.		
(6)—a) Wheeling to place		.06
b) Dumping, spreading and ramming		.11
(7)—a) Supervision: ⅓ of foreman's time charged in above items, at 40 cu. yds. per day, $2.00 divided by 40		.05
b) Care of water		.00
Charged in under item 4.		
Cost without plant		$0.58

*Note—The stone is not loaded on a barrow but shoveled into the hopper of the mixer direct. The mixer being on wheels, it is a very simple matter to keep moving along as the stone pile is being used up. This is impractical with hand mixing, as there is generally part of the previous batch on the board when a new batch is started and the trouble to move and block up the board is greater than the saving in the handling of the stone.

To this must be added the cost of plant, ½ estimated life of a Miracle Absolute Feed Mixer, cu. yds	10,000	
Cost	$600.00	
Repairs during use for 10,000 yards	200.00	
	$800.00	
Salvage in Mixer	100.00	
Cost for 10,000 cu. yds	$700.00	
Cost per cu. yd. is $700.00 divided by 10,000		.07
Total cost per cu. yd		$0.65

This means a saving of 54 cents on every cubic yard of concrete mixed; a saving of over 45 per cent.

A question is always raised here by the adherent to the old fashioned hand mixing: "But how about the man who uses only 2000 to 3000 cubic yards of concrete per year? He would have to wait four years and use his machine for that length of time before he gets the full advantage of the 54 cents per cubic yard saving. He might not be in business by that time." Figure the saving from another point of view. Say, the user produces 2500 cubic yards per annum. The difference between hand and machine mixing, without considering the cost of machine, is $1.19—.58—61c saving; 2500 x .61—$1525. Deducting from $1525 the cost of the machine, $600, and there is a saving for one year of $925, 150 per cent of the cost of the machine. The machine operated the second year the $1525 is all saved, less the cost of repairs and maintenance to the mixer. One does not have to figure four years. The mixer has paid for itself the first year twice over.

So much for the relative cost of hand and machine mixed concrete. As to the relative value of hand and machine mixed concrete, there is no disputing the advantage of the machine mixture over even the most carefully mixed hand product. Most authorities give the strength of the machine mixture as 15 per cent to 20 per cent more than a hand mixed concrete. Some give even 25 per cent and quote from carefully conducted tests to bear them out. This is considering carefully hand mixed concrete. No wonder the engineers and architects are deploring the element of "personal equation" that enters so prominently into most concrete work. To limit this as far as possible, mixers are now always specified to be used on work of any importance. Even if it was not an actual saving, it would be cheap as good insurance against failure due to careless mixing. It means that the full value of the cement used will be developed. No cement is wasted.

It is the old story of physical labor vs. machinery, and the truth of the above cannot be more forcibly stated than by the saying so well known to the trade—"Once a mixer, always a mixer."—Miracle Concrete.

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Chicago's Latest Architectural Achievement

The latest attempt to outdo what has already been done in the construction of a large office building in Chicago, Ill., is the new structure just designed by Architects D. H. Burnham & Co. for the People's Gas Light and Coke Company. This building, including the site, will involve the expenditure of approximately $6,000,000. It will rise twenty-one stories above the street level which is the limit of height in the Chicago buildings, and will occupy a plot having a frontage of 196 feet on Michigan avenue and 172 feet on Adams street. The total floor space of the structure will be more than thirteen acres, providing room for 1500 offices, in which from 3000 to 5000 persons will engage in business during the working hours of the day.

The facades of this new skyscraper will be of granite and glazed terra cotta, and all the granite will be polished to the top of the fourth story. On the main fronts of the building will be a colonnade of eighteen monolithic columns, each of which will be 4 feet 3 inches in diameter and have a height of 26 feet 6 inches. These will be the largest granite columns thus far placed in Chicago, and among the tallest stones ever cut in this country. They were cut at Cape Ann and polished at Worcester, Mass., and each of them weighs 30 tons. The building is to be absolutely fire-proof, and will involve some difficult engineering problems. Caisson foundations will be sunk for its support.

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That Fatal "Almost"

A YOUNG man, armed with letters of introduction from prominent men, one day presented himself before Chief Engineer Parsons, of the Rapid Transit Commission of New York as a candidate for a position. "What can you do? Have you any specialty?" asked Mr. Parsons. "I can do almost anything," answered the young man. "Well," remarked the chief engineer, rising to end the interview, "I have no use for any one who can 'almost' do anything. I prefer some one who can actually do one thing thoroughly."

There is a great crowd of human beings just outside the door of proficiency. They can half do a great many things, but can't do any one thing well, to a finish. They have acquisitions which remain permanently unavailable because they were not carried quite to the point of skill; they stopped just short of efficiency. How many people almost know a language or two, which they can neither write nor speak; a science or two, whose elements they have not fully mastered; an art or two, which they cannot practice with satisfaction or profit!

Everywhere we meet people who are almost successful. Here is a man who is almost a lawyer, but not quite; here is another who is almost a physician, but is neither a good druggist, a good surgeon, nor a good dispenser. Another man is almost a clergyman, or about halfway between a farmer, or a tradesman, and a clergyman. Another is almost a teacher, but not quite competent to take charge of a school or an academy. In every country there are men and women who are almost something, but just a little short of it.

If these people undertake anything, they never quite finish it; they never quite complete their courses at school; they never quite learn a trade or profession. They always manage to stop just short of success.

In thousands of American homes, lying, perhaps in the attic, woodshed, or workshop, are scores of ingenious, labor-saving devices, or inventions, which, if carried a step further and patented, would not only give those who originated them a competence for life, but would enrich the civilization of the world. But the thinkers get discouraged or tired, or lack persistency, the habit of carrying things to completion; and so the half-developed machinery, the embryo invention, has never come to light, and the time spent upon it has been lost, perhaps worse than lost, because the lesson of perseverance, persistency, thoroughness was not learned.

The Patent Office at Washington contains hundreds,—yes thousands,—of inventions which are useless simply because they are not quite practical, because men who started them lacked the staying quality, the education, or the ability necessary to carry them to the point of practicability. Edison has been shrewd enough to carry many of these half-finished inventions to useful application and commercial success.

The world is full of half-finished work,—failures which require only a little more persistence, a little finer mechanical training, a little better education, to make them useful to civilization. Would that we had a thousand Edisons to pick up all such dropped cords or threads, half-finished inventions, abortive attempts and discoveries which have stopped just this side of practicability! What a blessing to civilization are men who can do things to a finish, who complete what they undertake, who leave nothing half done! Think what a loss it would be if such men as Edison and Bell had not come to the front and carried to a successful termination the half-finished work of others!

"Almost" is a dangerous word. It has tripped up many a man who might have been successful if he had formed the habit of painstaking thoroughness in youth, the habit of doing everything he undertook to a finish.

There are multitudes of people today plodding along in mediocrity, many of whom lay down right in sight of their goal, just because they were satisfied when young with "almost" doing things; "almost" learning their lessons; "almost" finishing the tasks they were given to do. Like the boy who was sent after the sheep that had strayed away from the flock but who returned without them, and in answer to his father's query if he had found the sheep, said, "Yes, almost, father," they never seemed to realize the gulf that separates "almost" from "to a finish."—Marden in "Do It to a Finish."

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Getting Along with Men

A CONTRACTOR in New York who has worked his way up from the bottom, and who is noted for his success in getting along with his men, being asked the other day for the secret of this success, looked puzzled for a moment, ran his hands through his hair, and then remarked rather uncertainly that "It must be because I never yell at 'em." Here is his story as told to a reporter of the New York Press:

"I never yell at a man unless I can't make him hear. If I'm up on a roof I have to yell at a man in the basement, and if there's machinery going I have to yell to make myself heard, but I never, under any other circumstances, raise my voice above an ordinary speaking tone.

"You see, I like a fast horse and I've always had one ever since I could afford it. I'm a hayseed myself. I was raised with horses. I learned when I was a boy that you couldn't get any speed out of a horse if you got excited yourself. The only way to get speed out of a horse is to keep cool. The minute you get a horse excited and nervous he's going to act up, you're going to have trouble and you ain't a-going to get the speed. Ain't that so?

"Well, a man is just the same as a horse, just exactly. You get him excited and nervous, and out of ten motions he makes nine of 'em 'll be false ones. You might better ease him along a little and let him make six motions and all of 'em right, or five of 'em right. You'll get more work out of him in the end. A boss that gets his men mad and hatin' him all the time ain't never going to be no success. The men'll work, because they have to: they won't never put no heart nor good will into it.

"When I give a man directions I always tell him plain and straight what's to be done. I've done each particular thing that I ask my workmen to do myself, from the bottom up. The first pair of long pants I ever wore I put on to come down here to New York and go on a job under my uncle. If one of my men asks questions and wants explanations, I always give them to him, civil and patient, so that if he don't understand it's either because he ain't got brains enough or don't pay attention. If he doesn't do that work right I never yell at him. I never got mad enough to yell at anybody in my life. I speak to him just the same, and he doesn't know whether I'm mad or not. If he doesn't do his work it's either because he can't or he won't.

"In either case I don't want him. I give him what change is comin' to him and let him go without any hard words. That's a boss' privilege, and that's what he's here for. And, in fact, the men under me never know when they're goin' to get the sack, because I never speak no different nor have no rows, and the only way they can tell when they're in danger is by what they know about the way they've been working. It's not a case of shirking when I'm pleasant and speeding up when I'm ugly. They know they'll never know when I'm mad till they get their time and then it'll be too late to do any speeding up.

"I don't approve, anyway, of speaking to men under you as if they were animals, or an inferior sort of men. If a man's a good man I want to keep him. He's valuable to me, and I respect him, and wouldn't speak to him in any different tone than I would to my own boss. If he's good enough to keep, he's good enough to respect. If he ain't good enough to keep I let him go, and that's all there is to it. A man isn't the boss' inferior simply because he's under him. If I were to leave my job tomorrow, there's a number of men under me that are fitted to take my place, but only one of them could have it. The rest of them wouldn't necessarily be his inferiors, because only one man could be foreman. And it ain't right to look down on a man because he can't do higher work than he's doin'. If he does his own work well, he's worthy of respect."

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Tapering Concrete Chimneys

The majority of the numerous reinforced concrete chimneys that have been built are cylindrical in shape, due to limitation in the design of the forms, and where a variation in diameter is made, this has been effected by an offset. Recently, however, says Engineering News, some special designs of form construction have been devised which permit the building of tapering stacks without excessive cost for this feature of the work. The forms, which are five feet high, consist of sets of rings, steel plate forming the surfaces, and long bolts, by means of which the adjustments of diameter and wall thickness are made. The rings are of sufficient diameter to enclose the base of the chimney, and are made of heavy angles bent to varying radii and spliced into complete circles. The radial bolts must be long enough to permit of their extending into the chimney surface where the diameter is smallest (at the top of the chimney). The diameter of the rings remains constant, standard sets of form rings being carried in stock for various sizes of chimneys. The steel sheets are of standard size, and are filled out with split sheets, made interchangeable. The sheets are secured by flat-head stove bolts to vertical stiffeners on the outer surfaces of the forms, except at one rib, where the adjustment is taken up. The varying diameter is obtained by means of the long radial bolts which turn through small angles attached to the steel rings, and end in malleable clips which grip steel bands on the outside of kerfed wood strips which press the sheets in to the desired radius. Permanent centers are kept at the base of the chimney and on the scaffold above, and each section of the chimney is plumbed. Thus perfect alignment is secured throughout the construction.

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Next Convention, Los Angeles

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OFFICERS FOR 1910-11

President..................Ellis F. Lawrence
Vice-President............David L. Williams
Secretary ....Fred Alyn
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Largest Beam Girder on Coast

The new Pythian Castle at Valencia and Hermann streets, San Francisco, designed by Architects Paff and Bauer, enjoys the distinction of having as its structural feature the largest steel girder of any building on the Pacific Coast. There have been larger beams, but they were in lengths, assembled and riveted, but this one is composed of two flanges 60 feet long, 30 inches deep and weighs 180 pounds to the running foot, riveted to a solid ⅝-inch steel plate 48 inches wide, and the whole weighs within 300 pounds of 11 tons. The two flanges, each a solid piece made at the Bethlehem, Pa., steel works, are said to be the most perfect girders turned out from any works in the country. It is part of the structure on which the floor of the auditorium will be laid, and the base is 30 feet above the main floor.

No Time to Talk to Contractors

Architect Edgard A. Matthews who has offices in the Phelan building, San Francisco, says if he were to see every contractor and material man who calls at his office there would be no time left for work. As a kindly warning to visitors who call except on professional business, Mr. Matthews has posted the following notice on the corridor door of his office and he declares it has proved most effective:

NOTICE

This office is conducted mainly and primarily for the convenience of clients. No office can have sufficient business to accommodate the increasing number of contractors who continually apply for permission to bid upon the various work; furthermore it is unfair to those already concerned in bidding, and is a trespass upon office time. Contractors, agents and solicitors are kindly requested to send all applications, catalogues, pamphlets and solicitations by mail, which will receive proper and careful attention; otherwise they will not be considered. A busy office cannot consistently be conducted in a businesslike manner if time is too much occupied by consultations with others than clients.

Architectural Club to Move

The San Francisco Architectural Club, which has occupied quarters jointly with the San Francisco Press Club, has secured a satisfactory lease of four large rooms on the fourth floor of the Rochat-Cordes building on Post street and the rooms are now being put into shape for the club's exclusive occupancy. The location is an excellent one and the rooms are large and conveniently arranged. It is possible that arrangements will be made with the Chapter to hold its meetings here. The San Francisco Architectural Club has a membership of 170, many of whom are also members of the Institute Chapter. It has been decided to make the monthly dues $1.50.

The Home Products Movement

The terra cotta manufacturers are manifesting keen interest in the plans of State Mineralogist Lewis A. Aubury to provide a substantial exhibit of California building products at the Ferry building in San Francisco. According to declarations of the terra cotta men this state has the best and probably the most extensive deposits of clay in the country.

As a result of the meeting it was agreed that an exhibition structure, made entirely of California products, shall be built at the mining bureau in the Ferry building, to which all will contribute in construction. A permanent exhibition of California structural materials of all kinds will also be placed in the bureau.

As the beginning on this campaign Aubury has prepared for distribution among architects 1,000 copies of the state law affecting the use of state materials. This law declares that preference shall be given in state, county or city contracts to goods wholly or in part manufactured or produced in California.

New Bridges for Colusa County

County Engineer Charles de St. Maurice is preparing plans for a number of concrete and steel bridges for Colusa county. In each instance the concrete bridge will replace antiquated wooden structures which have required annual repairs for years, expense of maintenance amounting to considerable more than the original cost. Experience has demonstrated that there is absolutely no cost for maintenance or repairs attached to concrete structures. One of the new bridges will be built across the trough between the railroad and the Sacramento river and will be 1160 feet long and will cost $40,000. Another concrete bridge will replace a wooden structure over the Sycamore slough while a third bridge will be built over Bear Creek. A concrete dam with floodgates for irrigating purposes will also be built.

San Francisco Architects Down the Peninsula

The country down the Peninsula, between San Francisco and San Jose, is proving to be quite alluring to San Francisco architects. In and around San Mateo and Burlingame will be found the residences of Lewis Hobart, Willis Polk, Charles Toepke, W. L. Schmolle, George Howard and a number of others. Further down the Peninsula at Redwood is the splendid estate of Albert Pissis. At Menlo Park William Curlett & Son are building fine homes, while at Palo Alto are G. Alexander Wright and Charles F. Hodges. At Los Gatos Henry C. Smith is building himself a picturesque summer home.

Modern House for George H. Roos

Architect Houghton Sawyer of San Francisco has prepared plans for a residence for Mr. and Mrs. George H. Roos which embody nearly every modern device for the comfort and protection of its owners. The house will cost in the neighborhood of $50,000 and besides the usual conveniences to be found in an up-to-date home it will have a burglar alarm system, automatic fire sprinklers, telephone service connecting all rooms, refrigerating plant, etc. The house will be built of steel, stone and brick with interior of marble and tile and expensive hardwoods.

Big Concrete Warehouse

One of the largest reinforced concrete warehouses on the Pacific Coast has been designed by Architect Norman R. Coulter of San Francisco. The building is for the Deer Implement Company and will be erected on Brannan street, near Sixth, at an estimated cost of over $200,000. It will be four stories high and will contain over 600 tons of reinforcement. The frontage will be 275 feet.

San Francisco Chapter, American Institute of Architects

A SPECIAL meeting of the San Francisco Chapter, American Institute of Architects, was held at Tait's Cafe on Thursday evening, June 16th.

Mr. James W. Reid for the Committee on Entertainment and Reception reported that $4,900 had been subscribed for the Institute Convention Fund.

Mr. George Rushforth for the Committee on Headquarters said the committee was awaiting developments.

Mr. G. B. McDougall for the Committee on Competitions, reported that communications had been sent to the Druid's Hall Society and the trustees of the Colma schools, regarding proposed competitions.

Mr. E. J. Vogel, chairman of the Building Laws Committee, reported action regarding the roofing ordinance; and in connection therewith, a communication from the H. W. Johns-Manville Company, in regard to the ordinance, was read; and on motion duly made and seconded, the committee was advised that the chapter recommended the revision of the ordinance so as to provide for a five-ply composition roof without the asbestos sheet and of a three-ply asbestos roof.

The Committee on the Revision of the Constitution and By-laws submitted proofs of the proposed changes. The reading of the same was deferred under the heading of "New Business."

Mr. Bakewell, as one of the chapter's delegates to the San Francisco Housing Association, reported that the two chapter delegates were on the committee to take up the revision of the state law. Mr. Joseph of the same committee also reported the decision of Judge Troutt declaring Section 23 unconstitutional but that the same would be appealed by the City Attorney as was the custom. However, it was presumed the decision of Judge Troutt would be upheld, Mr. Joseph also reported that Mr. Long had volunteered the service of his office for the purpose of advising with the chapter regarding any proposed or contemplated building ordinance revision.

Messrs. David Salfield, Leon H. Smith, Theodore W. Lenzen and William J. Wright were elected to membership.

Communications were received and ordered placed on file from the H. W. Johns-Manville Co. regarding the ordinance requiring an asbestos sheet in roof covering; from the Rhode Island Chapter, A. I. A., advising the chapter of the publication of its year book; from Glenn Brown, secretary of the A. I. A., regarding circulars on the competition of the Ohio State University library and from John M. Carrere, chairman of the Standing Committee on Competitions of the A. I. A., acknowledging the receipt of the chapter's notice regarding the Oakland city hall competition.

The next order of business was the reading of the proofs of the revised Constitution and By-laws. As there were numerous questions involved, the same, after reading, was referred back to the committee with several suggested changes, to be reported on at the next chapter meeting.

Mr. Paff called the chapter's attention to the Charter Revision Committee which was at work on the charter of the city of San Francisco, for the purpose of inquiring whether there were any matters likely to come before the Revision Committee in which the chapter would be interested. Acting on this suggestion, the matter was referred to the Legislative Committee for action.

The attention of the chapter having been called to the acting city architect not being certificated, on motion made and seconded, the matter was referred to the State Board of Architecture.

Portland Architectural Club

The Portland, Ore., Architectural Club has elected the following officers: President, Ellis F. Lawrence; vice-president, David L. Williams; secretary, Fred Alyn; treasurer, John M. Hatton.

During the past year successful scholarship work has been carried forward with a class of twenty members, the work being done under the direction of the Beaux Arts Society of New York. The drawings have been sent to the subcommittee of the Beaux Arts Society in San Francisco and in the judgment of local men have received their share of "mention" in competition with work from Seattle, Los Angeles and San Francisco.

Portland architects have subscribed $200 for the scholarship work, and plans are under way to raise a permanent endowment of $20,000 from the coast cities under the direction of the Architectural League of the Pacific Coast. This fund will then yield interest sufficient to send one man each year to the east or Europe for architectural education.

The Portland Architectural Club Exhibit

The second annual exhibition of the Portland, Ore., Architectural Club held in the Museum of Fine Arts in June, was an unqualified success. Fully one thousand perspectives by the architects of the Pacific Coast were exhibited. The drawings included hotels, apartments, office buildings and residences, landscape work and municipal structures.

The art collection by Edwin Howland Blashfield was the most complete and noteworthy ever exhibited in any city. Thirty-six large paintings made up his collection.

The office and business buildings by E. F. Lawrence, Doyle & Patterson and D. C. Lewis of Portland, and Reed Bros. of San Francisco were among the best of their class. Hotels and apartments were depicted by Gibson and Cahill, Claussen & Claussen, and Whidden & Lewis. Municipal architecture was illustrated by Joseph Jacobberger of Portland and Cutter & Malmgreen of Spokane, Wash. Whitehouse & Fouilhoux, Ernest Korner and Bennes & Hendricks of Portland exhibited drawings of schools and halls. Landscape work was shown by W. D. Cook of Los Angeles, Gould & Champney of Seattle and Thomas Hawkes of Portland.

Oakland Architects Organize

Owing to the absence from the city of many of the members, the June meeting of the Architectural Association of Oakland was postponed until the last Monday in the month, which has been adopted by the body as its regular monthly date for assembling. The association is made up of the most prominent architects in Oakland, and the purpose of the organization is to look out for the city's welfare, and lend every aid possible to the Board of Public Works in its efforts toward beautifying public property. Walter Mathews has been unanimously elected president of the association, though he has not as yet made known his acceptance of the honor. J. Cather Newsom is vice-president with Mr. Wright, of Deuel & Wright, secretary.

Los Angeles Country Club

The contract for the general construction of the Los Angeles Country Club building, to be erected in Santa Monica, has been awarded for $75,000, but additional contracts yet to be awarded will bring the total figure far beyond the hundred thousand mark.

The plans as prepared by Architects Hunt, Eager & Burns, Laughlin building, Los Angeles, call for a two-story main building, 144 x 340 feet in dimensions, and a number of out-buildings and accessories. The exterior will be of plaster over metal lath and will have concrete foundation and slate roof. There will be large verandas and screen porches, with cement floors and columns and a front terrace, 98 x 28 feet.

The first floor will contain a sitting room, 75 x 42 feet; a dining room, 48 x 50 feet; a grill room, music room, alcove, dressing room and lockers for ladies, and lounging room, billiard room and lockers for men. The floors will be of oak, and the finish will be in natural redwood. There will be four brick and tile fireplaces, plate and art glass windows, shower baths and plunges, and a complete culinary department. The toilet rooms will have tile floor and marble wainscoting.

Thirty-five sleeping apartments will occupy the second story. They will have white enamel finish and maple floors. The building will have a complete heating system, and the plumbing contract will amount to about $8000.

The grounds will be laid out in tennis courts, golf links and a large park. A feature of the place will he the water supply, provided by an artesian well on the property.

Southern Pacific Terminal Depot

It is reported on good authority that plans are now being prepared by a firm of Chicago architects for the new terminal passenger depot which the Southern Pacific intends to build on East street at the foot of Market, San Francisco. Bonds for the purpose and amounting to $25,000,000 are now being floated. This money is to be used for acquiring additional right of way besides paying for the depot. It is said the building will be modeled after the big Pennsylvania Railroad station. An office building to house all the Southern Pacific officials and clerical force is also planned. The company's lease of part of the James Flood Building expires in another year but may be renewed for one or two years pending completion of the terminal building.

McDougall Wins Visalia Competition

The plans of Architect Ben G. McDougall for a high school at Visalia have been accepted in competition with a number of other architects. Mr. McDougall's plan calls for a one-story and basement classic structure of brick and terra cotta. The estimated cost of the building is $40,000.

Personal

James E. Blackwell and Frank L. Baker, associated as Blackwell & Baker, architects, announce their removal from the Mutual Life Building to new offices at No. 824 Northern Bank building, Seattle, Wash.

Mr. Charles Adrian Popkin has opened an office at Sapulpa, Okla., and he would appreciate receiving copies of catalogues, etc., from the trade.

J. Flood Walker and H. A. Reuter, architects, announce a partnership, with offices in the Frost building, San Antonio, Texas.

Realty Syndicate Building

Contracts are being let for an eight story addition to the Realty Syndicate building in Oakland from plans by Architect W. L. Woollett. The estimated cost of the addition is $250,000. The original plans for this building were prepared by Architect D. Franklin Oliver.

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The Oakland City Hall competition is ended and we admit it came nearer to being satisfactory than any public competition heretofore conducted on the Pacific Coast. The Architect and Engineer has never enthused very much over competitions for the reason that so few of them are carried out fairly. Too often the real merit of the architect's work is overlooked and the prize is awarded to the contestant having the most influence with the committee. The result is that good architects have become disgusted and where one used to find a score of reputable members of the profession submitting competitive drawings we now find less than a half dozen, and these few are too frequently men of little experience and limited practice.

THE OAKLAND CITY HALL COMPETITION

While we would have been most pleased to announce a San Francisco architect as the successful competitor in the Oakland contest, the prevailing sentiment is that the judges made a just award, giving the first prize to a New York firm whose drawings were actually the best. The front elevation, to be frank, was nothing extraordinary, but the renderings are said to have been superbly fine. We can take some consolation in the fact that so many of the San Francisco competitors received prizes for their work, which, indeed, speaks well for the profession on this coast, and indicates that we have the talent and are abreast of the times.

It has been said, and perhaps with a grain of truth, that the Oakland city officials preferred having the first prize go to an Eastern firm because it would mean some outside advertising for the Bay City. Had a San Francisco architect been given the work it is very probable that no attention would have been given the contest by the eastern papers. As it was, the New York press announced the result of the competition under conspicuous headlines, and Oakland got some free advertising.

It was probably this desire to gain notoriety that prompted the Oakland officials to hold such a pretentious competition, and it may also have induced the Mayor and others on the committee, when preparing the list of eligibles, to name two eastern architects to one San Francisco member of the profession. In this the committee laid itself open to just criticism, for if it did not care to include more San Francisco architects it might, at least, have selected one or two good men from Los Angeles, Portland and Seattle. Even Oakland was overlooked in the scramble for the big eastern men.

THE ARCHITECT AS AN ARTIST

In modern practice the path of the architect is beset with obstacles which combine to make it difficult for him to maintain his identity as an artist. But there is one department of American architecture which is open to all designers who care to enter it—domestic work—where there are comparatively few restrictions of a troublesome nature. It is naturally in this kind of work that we count the greatest number of artistic successes.

There is no reason why an architect cannot be an artist in whatever he undertakes, but he knows that his greatest opportunities lie in certain directions and, consequently, he equips himself to follow along certain more or less restricted lines. He is never so free to develop his artistic powers as when he has to make a home with the requirements of which he must acquaint himself, the character of the surroundings which he must avail himself of, and the materials which are his means of expression. Here the result is as truly personal as possible.

The architect studies his problem until he sees his image clearly, then the rest is simple enough for him. He knows that the effect he is seeking calls, for instance, for ruggedness of lower walls; he therefore takes the field stone as it comes and leaves it alone, he uses his timbers so that they remain timbers and do not stimulate something foreign to the case. He recognizes the fact that he is creating an episode in a picturesque landscape of the most naive kind. Consequently, the masses of his composition are simple and large and their relation perfectly apparent while his constructural features are equally frank and unpretentious, likewise the colors of all painted portions of the woodwork. In short, everything is conceived in the same harmonious key to which the surroundings and the purpose of the structure give the clue.

THE CONCRETE RAILROAD TIE

In an effort to make more progress in the mighty tie problem of the modern American railroad today, the Santa Fe railway has taken up with vigor the reinforced concrete tie experiment, and has witnessed the first signs of success.

In June, 1907, the Santa Fe placed twenty reinforced concrete ties in the main track between Los Angeles, and Redonda Junction. In March, 1908, the inspector of track and roadway reported that the ties showed "no indication of deterioration or failure in any way," and in April, 1910, they were reported to be "in first-class condition in every respect." The track on this line is ballasted with gravel and the traffic is heavy.

The tie is reinforced with horizontal steel rods bent up under the rail seats and tied together at intervals with vertical rods, which serve also as web reinforcement. The rail is secured to the tie by spiking into sections of wrought iron pipe set in the concrete. The inside diameter of the pipe used for this purpose is a little less than the greatest dimension of the spike, in order that the spike may cut the metal enough to insure a firm connection.

The length of the section of pipe is made the same as the depth of the tie, and both ends are passed through tie plates and expanded, so as to hold the plates solidly in the surface of the concrete. This construction allows the tie to be used with either face up. It is necessary to use a spike with a head so formed that its under face will conform to the top of the rail base when the spike is partially rotated, for at each redriving the spike should be turned so that its edges will cut an unused portion of the pipe and furnish a new bond. When the surface of the concrete crumbles under the tie plate or the end of the tube becomes too badly worn to hold the spike, the tie may be turned over in the track, thus providing a new surface and an unused portion of pipe to spike into.

The cost of the tie when made in small numbers is given by the inventor at about $1.30, and it is stated by the same authority that a railway, by using company forces in the making of the ties, could reduce this price by at least 25 cents.

In addition to the installation on the Santa Fe, a slightly modified form of this tie has been installed on all the lines of the Los Angeles Railway Company, but no reports of its performance in this service are as yet available.

The shortage of suitable timber for railroad ties and the constantly increased expense of the same has led many railroad companies to make experiments costing thousands of dollars for the purpose of improving the tie situation.

At this time the Santa Fe is shipping millions of ties from Japan to place under the rails in this western country. Needless to say, this is costing the company millions of dollars every year.

At San Jose experiments with the concrete tie have been made by the Southern Pacific Company and it is said the tests have been very satisfactory.

The day of the concrete railroad tie would seem to be close at hand.

To Rebuild Memorial Chapel

The Stanford memorial chapel at Palo Alto is to be rebuilt at once from plans by Architect Clarence R. Ward. The steel work is already practically completed, Dyer Bros. having taken the contract. The tower will not be built for the present, but it is hoped to restore the Mosaic tile work which was a feature of the former chapel.

Personal

Architect Alfred Henry Jacobs announces the removal of his offices to the seventh floor of the French bank building, 110 Sutter street, San Francisco.

Relations of Railways to the City Plan

THE American Institute of Architects has done a great service to the cause of better planning of cities and the revision ot plans of our larger cities to suit modern conditions by bringing together for thorough discussion of the problems of the relations of railways to city development a number of experts from among the railway managers, engineers and architects and publishing the paners and discussions in a special volume, which can probably be obtained from the secretary of the Institute, Glenn Brown, Washington, D. C.

The problem is much more complicated than would seem probable until it has been studied. President Delano of the Wabash railroad read the first paper and called attention to the differences in topography as making the most pronounced differences in the solutions of the problem for various cities. Height of buildings, with the concentration of people in the districts of high office buildings; the methods of housing the population, whether in tenements down town or in houses farther out; the size of the city, and the fact that the smaller cities want the railroad stations, especially the passenger and mercantile freight stations, as near the center of the city as possible, are other important factors, according to Mr. Delano.

And the character of the passenger and freight traffic also makes a material difference in the treatment of the problem of terminals. Thus rapid transit trains within the city and immediate suburban limits; interurban electric traffic, which is omitted from Mr. Delano's consideration; local trains; through traffic; whether the city is a terminal or a way station, or both, require differences in treatment. Then, too, the freight service to and from the mercantile districts, the manufacturing districts, the building and other bulky material districts demand differences in treatment.

In the large cities there is now a strong tendency to make the distribution of both freight and passenger traffic from the railroad terminals to the congested districts by tunnels or subways.

Mr. M. A. Long, architect for the Baltimore & Ohio railroad, treated the subject from the point of view of the plan of the freight houses and tracks, their architecture and the arrangement of in and out-bound freight, cars and tracks.

The vast Hudson Terminal Station in New York and the handling of passengers and baggage and their transfer from trains to rapid and other city transit lines were described in considerable detail in a paper by J. Vipond Davies and J. Hollis Wells. The service by tunnel and subway to the station is well developed, as well as the financial reasons for the construction of the great office building over the station. The latter are mainly based on the economic necessity of raising sufficient income to carry the heavy investment in land under which to construct the station. The problem of station stairways is treated in this paper also.

John R. Rockart, architect, and I. D. Waterman and C. W. Lord, engineers, for the New York, New Haven & Hartford railroad, show the relations of the railroad buildings, retaining walls, bridges and their surroundings to city development. The wonderful work done in Washington in fitting the railroad structures to the beautiful city plan; the fitting of the railroads and stations along the Cleveland lake front into the civic center plan; the relation of the railroad station and tracks to the proposed New Haven, Conn., improvements; and the work in foreign cities, such as Paris, Genoa, Hanover, Budapest, are set forth briefly; also the defects in such large schemes as the terminal stations in Boston, the new Pennsylvania station in New York. Some of the difficulties and successes in the treatment of the small suburban or through stations within the city limits or the well-populated suburbs are also shown.

The lack of study of the problem of distribution of freight is deplored and the Chicago plan for a central freight terminal, where the carloads will be broken up and the freight distributed in the district by subways, is mentioned. The use of electricity in moving the traffic within the city limits is asserted to be more economical than the use of steam.

Mr. George Cary, the designer, described the plans for the new Buffalo railroad terminals. Mr. Albert Kelsey discussed briefly interurban stations and trolley traffic in city streets.

Lighting the Country Home

"Ten years ago," says "Beautiful Homes," "it was customary for the man who was showing his country home to his friend from the city, to say, apologetically, 'Of course we haven't the conveniences here that you have in the city, but you can't expect to have everything you want when you live so far away from the city.' In recent years, however, modern progress and invention have given more serious attention to the home in the small town, and there is a growing disposition on the part of the man who dwells 'far from the madding crowd,' to insist on just as much comfort as his city brother. It is now no uncommon occurrence to find a country home equipped with bathrooms, hot and cold running water and lighting gas piped into every room in the house."

For lighting the home, several plans have been devised, and among them is a combination gas machine, which gives the home what is really a gas plant on the premises. The invention can be set up in a corner of the basement or cellar, and requires little or no attention at all, once it is properly installed. It supplies a gas that is perfect in its illuminating qualities, to the different rooms of the house, and, like city gas, it can be used for both heating and lighting. Ordinary burners, open or fitted with the usual gauze mantel, are used for lighting, and the light produced is clear, white and brilliant.

The fuel used is gasoline, stored in a combination fuel tank, buried in the ground outside the house. In most cases it requires to be filled with fuel about once every six months, and requires no further attention. The principal parts of the machine are a pump which works with a weight, and is wound up in a few minutes every few days, and an automatic mixing regulator, which needs no attention whatever.

Experience has demonstrated that gas can be produced by this method at a cost not to exceed $1 per thousand feet. This makes the cost of light at an 80 c. p. burner about one-fourth of a cent per hour. This is certainly very cheap, much cheaper than the average city dweller can purchase his light.

Imperfect Gas Heaters Cause Death

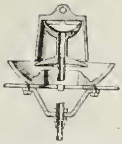
Improperly installed gas water heaters and stoves especially in bath rooms have caused many deaths from carbon monoxide gas poisoning in different parts of the country recently. Attention was called to this danger in a forceful manner for the first time about a year ago when an entire family was killed at Washington, D. C. Undoubtedly many deaths ascribed to asphyxiation by illuminating gas have been due to this form of poisoning. There is always danger where the gas heater or stove is improperly installed and there is no ventilation for the room. All the oxygen in the room is quickly consumed, and the poisonous gas fills the lungs. Several instances of death in this form occurred within the last month in Chicago.

Ventilation of School Rooms

The uniform distribution of air is one of the most difficult problems connected with ventilation, says the Engineering Review. This difficulty does not arise from the inability to introduce a definite volume of air into a given space in a certain specified time, but in the prevention of the formation of air currents and eddies which interfere with efficient ventilation. Intimately associated with this question of uniform air distribution is one of warming the incoming air sufficiently to prevent a sensation of chilliness on the part of the occupants of the room.

Prof. R. C. Carpenter in his book, "Heating and Ventilating Buildings," says: "It is quite generally agreed that the velocity of the entering air should not exceed 4 to 6 feet per second, unless it can be introduced in such a position as to make an insensible current."

Professor Carpenter further says:



"A most effective location for the air inlet is probably in or near the ceiling of a room. The advantages of introducing warm air at or near the top of the room are: (1) The warm air tends to rise and hence spreads uniformly under the ceiling; (2) It gradually displaces other air, and the room becomes filled with pure air without sensible currents or draughts· (3) The cooler air sinks to the bottom and can be taken off by a ventilating shaft.

"So far as the system introduces air at the top of the room, it is forced distribution, and produces better results than other methods.

"The outlet for air should be as near the bottom of a room as possible and it should be connected with a flue of ample size maintained at a temperature higher than that of the surrounding air, unless forced circulation is in use, in which case, the excess of pressure in a room will produce the required circulation.

"The conditions as to size of the outlet register are the same as those for the inlet."

Prof. S. H. Woodbridge in a pamphlet on "Schoolhouse Warming and Ventilation" states:

"The location of outlets and the concentrated or diffused movement of air through rooms are the chief determining factors of the problem of heating and ventilating. The location of the fresh and warm air inlet is of less moment than that of the outlet. It is wholly unnecessary to carry the entering air by flues to the vicinity of the outer walls. * * * The best location for the inlet is upon the inner wall at a point that shall be central with reference to the outside wall or walls."

Erased

"Is there any soup on the bill of fare?"
"No, sir—there was, but I wiped it off."

Standardization of Plumbing Material*

By Eugene S. Willard

At the last meeting of this society held in Omaha a year ago, I had the pleasure of presenting a paper on the "Standardization of Plumbing Material." The subject matter of my paper met with the hearty approval of this society, and as a result of the reading of the paper and the discussion thereon a committee was appointed from this society to meet with a committee to be appointed from the Manufacturers of Jobbers of Plumbing Supplies. The Central Supply Association appointed such a committee representing manufacturers of soil pipe, and in accordance with a resolution of our society the National Association of Master Plumbers also appointed members of the committee. A meeting of this committee was held and it was decided that actual measurements should be secured from several manufacturers of soil pipe showing the exact sizes of wall thickness, depth of hub and other details for standard and extra heavy soil pipe from two inches to 6 inches. After considerable trouble and a lapse of a good deal of time, this information was secured by our committee and has been plotted on charts, and I have no doubt that at the proper time a report on this subject will be made.

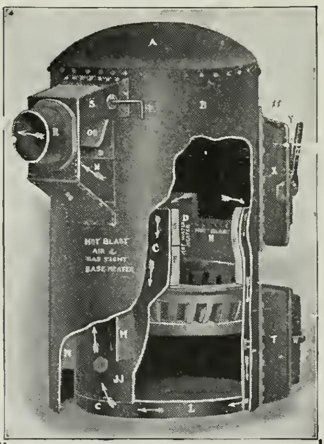
I believe that this society should continue to agitate for the standardization of plumbing material, and that while it is wise to begin moderately and perhaps confine the initial efforts to the standardization of soil pipe, that as soon as possible, without working any hardship upon manufacturers of such material, the standardization should extend to fittings as well. I also believe that it is possible to standardize many other articles of use in the plumbing business. We are

*Extract from paper read at annual meeting of American Society of Inspectors of Plumbing and Sanitary Engineers.

here in the home of the manufacture of pottery, and there are many persons in Trenton who are much better able to discuss the standardization of sanitary earthenware than I am. This business has developed into a very extensive and elaborate one, and many new designs of sanitary earthenware have been brought out in keeping abreast of the time, and to meet the progress of sanitation. In fact, I believe the manufacturers of sanitary earthenware have been leaders in the development of practical sanitation, and in no other place in this country will we have a better or more profitable opportunity to see the improvements that have been made than in Trenton, where the largest and best sanitary potteries are located.

As a matter of fact, some of the staples in pottery are already practically standardized, such as in height from floor, width and depth. I doubt, however, whether it will be possible to change the many conditions which are presented to the plumber by the various problems of roughing-in his work, which compels the potter to carry a stock of various measurements.

It is possible that, in addition to making the standards of which I have already spoken, as well as the spud and sizes of thread, and 5½-inch measurement for the seat post holes, that it would be possible to have the sizes of the trap in closets brought nearer to a standard, and this might be of material benefit.



Some New Books

Recent books received at this office for review include "The New Building Estimator," a practical guide to estimating the cost of labor and material in building construction, from excavation to finish. The volume contains some practical examples of work and the labor is figured out in hours and quantities. It is a valuable handbook for architects, contractors, engineers and draughtsmen. Published by the David Williams Company, 14 Park place, New York.

The same publishers have gotten out a revised edition of "Estimating Frame and Brick Houses." It is the eighth edition of this work by Fred T. Hodgson who has added, amended and modernized the previous editions.

"The Sanitation, Water Supply and Sewage Disposal of Country Houses" is published by the D. Van Nostrand Company of 23 Murray street, New York. The book is by William Paul Gerhard, C. E.

The first part treats of the general sanitation of country houses, brings a comparison of life in the city and in the country from a health point of view, dwells on the advantages of country life, and gives a condensed summary of the essential requirements of healthfulness in country houses. The soil, the subsoil, surface drainage, aspect, healthful surroundings and those which are objectionable, the cellar of the house, the lighting, heating and ventilation, the water supply, sewerage and plumbing, are briefly discussed.

In the second part detailed advice is given as to how to procure a satisfactory water supply. The sources of water, the various modes of raising it, the storage in reservoirs, elevated tanks or underground pressure tanks, and finally water distribution, are dwelt on at length and illustrated by actual examples from the author's engineering practice.

The third part discusses the all-important question of the sewage disposal for houses not in reach of sewers.

County Engineers to Organize

The engineers and surveyors of the different California counties have determined to form an organization and it is proposed to hold yearly conventions at which papers and addresses will be heard dealing with various problems of interest to the members. It is also planned to engage legal service to decide problems of law that may arise from time to time, and thus save delay and possibility of litigation when certain work is under construction. J. G. McMillan of San Jose is an enthusiastic promoter of the organization.

By the Way

Some Industrial Information Worth the While

Splendid Map of California

One of the best features of the annual report of the California Development Board, which has just been issued, is the map of California, covering all railroad additions and extensions to date, together with changes in county boundaries, making the most complete and comprehensive publication of the kind in existence. The map is twenty by twenty-six inches, and in addition to railroad and steamship lines, it shows the topography of the state in colors. On the border is a comprehensive list of industrial products, together with the counties in which each is to be found. The board makes a special feature of its maps, and in addition to a rack containing official county maps, it has a number of relief maps of the state and various districts. These show mountain and valley regions in such manner as to impress them indelibly on the minds of observers. The report, with a copy of the map may be had free on application to the board at its headquarters in the Ferry building, San Francisco.

Are You Looking for Good Paint?

W. P. Fuller & Company, the well-known distributors of high class paints and varnishes, have placed on the market a splendid porch and step paint. Owing to its extraordinary hard drying properties, combined with elasticity and durability, this special porch paint is admirably adapted for use on all surfaces that are being constantly walked on and subjected to daily washing and cleaning. The same house is carrying a "rubber cement floor paint," which is designed expressly for painting interior floors. The preparation consists of a tough, elastic coating that dries with a firm, hard gloss. Samples of these paints will be mailed free on request to any of the Pacific Coast branches.

Reading Hardware

Brittain & Company of San Francisco and Oakland, are having remarkable success in pushing the sale of Reading hardware in California. Many of the largest and costliest buildings erected in San

Francisco since the fire are trimmed with the Reading goods, some of the more recent contracts taken being the Pacific Union Club building, D. H. Burnham & Company, architects; the Wilson and Hess apartments and the Y. M. C. A. building, the latter designed by Architects McDougall Bros.

Iron and Steel Engineer

Smith, Emery & Co. announce that they have secured the services of Mr. A. W. Conner, civil engineer, who has for several years been associated with the Illinois Steel Company at Chicago, and has been for the last two years employed as engineer of erection in the company's new plant at Gary, Ind.

Mr. Conner is thoroughly equipped by experience, a graduate of Perdue University, and a most affable gentleman. He is a distinct addition to the Pacific Coast Metal Engineering circles. He will have charge, as manager, of Smith, Emery & Company's iron and steel inspection department, covering San Francisco, Los Angeles, Seattle, Pueblo and Birmingham.

In New Quarters

Bluxome & Company, the well known San Francisco specialists in reinforced concrete construction, have moved to the fifth floor of the Monadnock building where the accommodations are much better than at the old stand on Front street. The company has a number of good contracts under way.

Pioneer Roofing for School Buildings

The Manual Training Schools, a group of five buildings located on Vermont avenue, between 42d and 43d streets, Los Angeles, are being covered with Pioneer Specification Roofing.

The Hollywood Union High School buildings are also being covered with the same material. The Manual Training Schools require 100,000 square feet of roofing, and the Hollywood Union High School, 40,000 square feet.

Pioneer Roofing is manufactured by the Pioneer Paper Company of Los Angeles, California. Roofing booklet and samples of roofing will be sent by the company upon request.

For California Public Buildings

California heads the list in the amount of money appropriated for public buildings in the bill reported to Congress this week; the bill includes the following items: Postoffice, Pasadena, $200,000, of which $25,000 is immediately available; San Francisco sub-treasury, $500,000, of which $25,000 is immediately available; Berkeley postoffice, $180,000; Chico, same, $100,000; Hanford, same, $75,000. Postoffice site in Bakersfield, $20,000; postoffice site, Long Beach, $40,000; postoffice site, San Bernardino, $20,000; postoffice, Grass Valley, $55,000; postoffice and courthouse, Phoenix, $30,000; postoffice site, Douglas, $15,000; same, Globe, $15,000; same, Tucson, $15,000; same, Albuquerque, $20,000.

Your Door

The four-panelled door is rapidly receding from its once favored demand, and in its place comes the built-up door; the flush door; and for economy and endurance, the one-panel veneered door.

Of all lumber within or without a house, the doors have to be of absolutely dry stock; the gaping panel of a solid door is an eyesore and annoyance; the shrunken or warpen door—that never fits—discredits the finish of a house.

In order that the glue should adhere to the veneer in a built-up panel, it is a foregone conclusion that no moisture may be present; therefore, in accepting a veneered door, the builder is assured of dryness, and consequent satisfaction.

The flush door is acceptable where no exposure to moisture is presented; the one-panel door is not so costly, and is accepted for its durability and pleasing appearance.

For a trifling difference in cost, one-panel doors may be installed in preference to the old-fashioned kind, and their artistic effect adds much to the selling qualities of a house.

The great number of contracts calling for Oregon pine, suggested the Oregon pine veneered panel in the first place, and later came the Oregon pine veneered door, and now fifty per cent of local contracts call for Oregon pine veneered stock in some form or other.

Edw. F. Niehaus & Co., of San Francisco, the pioneers in this glued-up material, say they have sold more Oregon pine paneling since January 1st than all other woods combined.

"Mexican Comers"

In pursuance of vigorous efforts made by the various commercial enterprises, including the Chamber of Commerce and the Merchants and Manufacturers Association of Los Angeles, the A. F. George Company have shipped to Mazatlan, Mexico, a consignment of concrete pipe tools, gates and valves.

The consignment amounted to over two tons and was the first shipment of concrete pipe tools from Los Angeles to this territory. The goods are what are known as the K T gates, valves and tools, and are manufactured in Los Angeles county, a home product, and have been used and improved for the past twenty years in California where irrigating is a necessity and where they have proven their worth in that there are thousands of users throughout Southern California and the Pacific Coast.

While there are concrete pipe tools made in the east, Pacific Coast manufacturers of concrete pipe will not use them, first, on account of their uneven quality and second, inefficiency, because manufacturers east do not know the requirements of western irrigators.

A. F. George Company are extensive manufacturers and distributors of concrete mixers, concrete pipe tools, gates and valves, brick machines, block machines and concrete ornamental moulds of various styles.

Obtain 75 Per Cent More Light or Save 75 Per Cent on Current Bills

Parrott & Company call attention to the Grant Metal Filament lamp, which for economy and durability is said to be unsurpassed. The Grant consumes only 1.25 watts per candle-power, as against 3.1 to 3.5 for ordinary carbon lamps. In other words, the Grant lamp makes a saving of 75 per cent on current bills. Unlike the ordinary Tungsten lamp, the Grant Metal Filament burns in any position and stands rough handling. A trial order will convince you.

The following prices are now in effect:

Voltage	Watts	Candle Power	Standard Package	Clear List	Add for Frosted	Add for Pacific Coast Delivery
100-125	25	20	100	$0.75	4%	$0.02
"	40	32	100	.80	"	.02
"	60	48	50	1.10	"	.06
"	100	80	24	1.45	"	.07
"	125	100	24	1.70	"	.10
"	150	120	24	2.10	"	.12
"	250	200	12	3.00	"	.16
Round Bulb	40	32	24	1.25	"	.07
" "	60	48	24	1.50	"	.07

BLUXOME & CO.

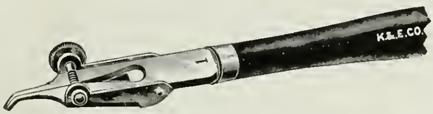
REINFORCED CONCRETE CONSTRUCTION

REINFORCED BUILDINGS, FIREPROOFING, FOUNDATIONS, RETAINING WALLS, ARTIFICIAL STONE PAVEMENTS, WATERPROOFING OF DEEP BASEMENTS.

532 MONADNOCK BLDG. TELEPHONE KEARNY 3281 SAN FRANCISCO

KEUFFEL & ESSER CO. OF NEW YORK

48-50 Second Street, San Francisco, Cal.



PAYZANT BLOCK LETTERING PENS

Particularly adapted for lettering Architects' and Engineers' Drawings: Form letters at a single stroke, and produce smooth lines of even width. Work can be done in ONE QUARTER OF THE TIME needed with the fine-pen method. Made in six graded sizes.

Write for Descriptive Circular

Detail of Hand Forged Wrought Iron Scroll made by Chr. Deterding

ART METAL WORKS

BANK FIXTURES, ELEVATOR GRILLES, ART FORGINGS and HAMMERINGS

Repairing of Antique Bronzes a Specialty

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1017 MONADNOCK BUILDING SAN FRANCISCO

Filling Many Brick Orders

The Los Angeles Pressed Brick Company reports a number of large orders recently secured, among which are the following: 1,125,000 paving brick for the Salt Lake City Traction Company, and a large order of paving brick for the Fresno Traction Company; 40,000 white enameled tile for facing the T. B. Rice store and hotel building at Fresno, designed by Architects Train & Williams, and for which the Aiken Reinforced Concrete Company of Los Angeles has the contract; 100,000 ruffled brick for the Santa Fe depot at Barstow; pressed brick facing and common brick for three buildings at Santa Monica, work on which has just commenced; 125,000 ruffled brick for the state exposition building at Agricultural Park, Los Angeles; hollow tile in the Union League Club building at Second and Hill streets; pressed brick for a large building at Ashland, Ore.; hollow tile for the floors, walls and partitions in the George Stimson residence at Pasadena; enameled brick for the E. M. Callender two-story building at Pico and Dewey; pressed brick for the Olshausen two-story business block at the junction of Spring and Main streets; for two business buildings at Pasadena, under construction by Mathew Slavin; the fire-proofing for the Los Angeles Trust & Savings Bank building at Sixth and Main streets, which will be done by the National Fireproofing Company. The Hollywood polytechnic school group is now nearing completion; in these buildings the Los Angeles Pressed Brick Company furnished the common brick and the cream pressed brick facing.

Reliance Hangers

The Reliance Door Hanger Company has issued a neat booklet giving a detailed list of New York buildings that are equipped with the Reliance hanger. The name of the architect of each building is also given and the list includes such well known members of the profession as McKim, Mead & White, Buchman & Fox, Clinton & Russell, D. H. Burnham & Company, Trowbridge & Livingston, Ernest Flagg, Henry Ives Cobb, Carrere & Hastings, Howells & Stokes, and Schwartz & Gross.

San Diego Exposition

Tentative plans for four reinforced concrete structures to form part of the San Diego Exposition are being considered by Director General D. C. Collier, of the exposition company. The buildings, which are to be permanent, are a stadium, an auditorium, a museum, and a Greek theater. They will be in the Mission style of architecture, and will be located on the south side of the city park.

Hart Heater Company Branches Out

The Hart Heater Company is having splendid success with its combination hot water boiler and Queen independent gas water heater. Wherever installations have been made the owners report being thoroughly pleased with the results. In a number of houses other heaters have been removed to make room for the Hart, a circumstance that leads to the conclusion that the latter gives best satisfaction.

That the fame of the Hart heater is by no means local is apparent by a statement of the company that heaters are now being shipped to Canada and it is expected that within a short time a manufacturing plant will be in full operation in the vicinity of Montreal, while a second plant may be established at Toronto. Arrangements are also being made to establish agencies in many of the large eastern cities.

The Hart heater has many advantages over other combination boilers of moderate price and it seems to be only a question of time before it is given first consideration, if, indeed, that time has not already arrived.

The following statement by the company is of interest:

"The Hart Combination Boiler has proven, since its introduction, to be the best, most practical and economical boiler of its kind ever manufactured, so acknowledged by all practical people and by those who have been fortunate in installing same in their respective households and insuring to them plenty of hot water for all purposes in a remarkably short space of time. The boiler itself is made of the best steel. Our burner (used exclusively by this company) is surely a great revelation, for not only does it give a tremendous volume of heat through the four prongs or spouts, but the amount of air mixed with the gas and consumed, owing to the unique construction of the burner, reduces the actual amount of gas used to about 30 per cent of the full blaze, or, in other words, while the burner is going full tilt, you are burning about 70 per cent of air, and this mixture of air and gas creates the great heat and efficiency, claimed by us, in heating the water through the copper coils.

"The saving in gas consumed must be apparent to the most casual observer.

"A 30 gallon boiler of water heated to 185 degrees in less than 20 minutes at a cost of less than two cents. Hot water sufficient for a bath can be obtained in five minutes.

(Continued on Page 115.)

(Continued from page 113.)

"The Queen independent gas water heater is, as the name indicates, an independent method of water heating and is to be attached to the common range boiler. The results are just as satisfactory as are obtained in our combination boiler, as the same means are used in heating process and with the same burner and same size copper coils. A 30 gallon boiler heated to 185 degrees in 20 minutes.

"There is no heater on the market that can compare with it, as to economy, efficiency and durability. No corroding or clogging up in the tubes as happens in cast iron heaters, for such is not possible in vertical copper coils."

The Hart Heater Company cordially extends an invitation to the public to visit the factory, 525 Seventh street, Oakland, between Washington and Clay streets, and witness, at any time, a demonstration of the combination boiler and "The Queen" independent heater.

What the San Francisco Board of Health Says About the Bradshaw Chute

The Sanitation Committee of the San Francisco Board of Health reported back to the board that, after careful investigation of this chute, they were satisfied as to its efficiency as a sanitary device, and were unanimous in their recommendation for its endorsement.

The following letter explains itself:

Department of Public Health
1085 Mission Street,
San Francisco, Cal.,
May 4, 1910

Mr. E. L. Williamson,
3552 18th St., San Francisco.

Sir: Referring to the matter of the Bradshaw Patent Garbage Chute, permit me to state that the matter was brought before the Board of Health on a report of the Sanitation Committee of said board, and while said committee was of the opinion that this type of garbage chute was a sanitary device and without doubt practical in its operation, the Board of Health, following a long-established precedent, decided that it could not go on record as endorsing any patent sanitary device when such endorsement could be used for commercial purposes.

Respectfully,
W. F. McNUTT, Jr.,
Health Officer.

Van Emon Elevators Represent High Standard of Efficiency

THE Van Emon Elevator Company, whose big manufacturing shops are in West Berkeley, has recently published a high class catalogue of its various types of elevators, together with many handsome half-tone illustrations of buildings erected on the Pacific Coast and equipped with the Van Emon machine. The book also contains the following statement of the company's position with reference to its plant and ability to produce superior machines.

"Van Emon elevators represent the same standard of mechanical efficiency that has made the name of San Francisco mechanics world famous in the construction of the battleship "Oregon."

"The Van Emon Elevator Company has a complete manufacturing plant on San Francisco Bay convenient to railroad and ocean transportation. We do not assemble eastern made apparatus but manufacture every part of our elevator engine and controller. Our stockholders are leading San Francisco capitalists and business men who realized, especially after the great fire, that San Francisco would be at the mercy of the New York Elevator Trust and the cost of building made prohibitive, unless a strong local company stood ready to make and install the most efficient and modern type of electric and hydraulic elevator machinery. The Van Emon Elevator Company was formed under the laws of California and capitalized for $1,000,000 and a modern plant built. This plant includes a foundry, machine shop, wood-working shop and an electrical shop, capable of turning out a complete elevator equipment every day in the year.

"The designing and standardizing of our equipment was placed in the hands of the best mechanical and electrical engineers in the United States and the successful installation of a thousand elevators in many of the most important buildings of the Pacific Coast cities from San Diego to Vancouver, British Columbia, has proved their efficiency and won for the Van Emon elevators the enthusiastic approval of the leading architects and engineers, who have planned and constructed these monumental buildings. We unhesitatingly refer prospective builders to the list of architects and owners listed in this booklet.

"We contend that the Van Emon elevators are the best made and must command the price paid for the best. Our competition is based on quality alone. We guarantee for our apparatus the perfect operative efficiency and absolute safety that the most modern elevator designing and

(Concluded on page 119.)

(Continued from page 115.)

intelligent and practical construction can secure. In proof of this we offer for confirmation and inspection, the Pacific Electric building of Los Angeles, the Foxcroft, Newhall and Hewes buildings of San Francisco, the Portland Commercial Club of Portland, Oregon, and the Dominion Trust building of Vancouver, B. C. (all class A buildings of from eight to fourteen stories in height and with elevators running at speeds of from 350 feet to 600 feet per minute). Such examples of elevator engineering prove that deeds speak louder than words or theories and that Van Emon Elevators have done the things we have guaranteed them to do."

Takes Extended Vacation

Thomas Morrin, C. E., with offices in the Balboa building, San Francisco, will be absent from the city for the next two months. He will attend the summer meeting of the American Society of Heating and Ventilating Engineers at St. Louis, Mo., and the joint meeting of the American Society of Mechanical Engineers and the Institute of Mechanical Engineers of Great Britain, at Birmingham, England, also the Institute of Civil Engineers of Great Britain at London, England.

Oakland City Hall Architect Here

The junior member of the firm of Palmer & Hornbostel, the New York architects, whose competitive plans for the Oakland city hall were awarded first prize, has arrived from the east and will act as the supervising architect in the construction of the new building, which is to cost $1,000,000. The firm's fees will approximate $60,000, of which it has received $5000 as first prize in the contest. The preparing of the specifications will probably require three months' time, after which the Board of Public Works will be ready to advertise for bids for construction.

The Board of Works at its last meeting ordered the payment of the other prizes in the competition, ten in number, as well as the retainer of $1000 each to McKim, Mead & White and Cass Gilbert of New York and Peabody & Stearns of Boston, who were to receive that amount for the submission of plans whether they were successful in the competition or not.

A resolution adopted by the Board of Works at a former meeting was amended to make the instructions to the City Engineer to prepare plans for the quay wall in the estuary from Myrtle street to Castro street read from Myrtle to Clay street, as City Engineer Turner announced that it would lessen the cost of construction to do the greater amount of work at the present time. The original plan contemplates the construction of the wall from Myrtle to Broadway, the balance of the work to be done at some future time.

Orpheum Theater, Los Angeles, Equipped with Bexhill Window Casement — *G. Albert Lansburg, Architect*

McNutt Hospital, San Francisco
W. L. Schmolle, Architect

The Bexhill Window Casement

THE Bexhill Casement Company, 718 Foxcroft building, San Francisco, would seem to have solved the casement window problem, having succeeded in placing upon the market a fixture that, according to its manufacturers, fulfills every requirement and at the same time is inexpensive. It is made of wood or metal for all classes of buildings, from a simple bungalow to a costly class A fireproof office building.

Here is a list of some of the buildings in which Bexhill windows are specified:

Orpheum theater, Los Angeles, G. Albert Lansburgh, architect.

Mullen apartment house, San Francisco, Charles Peter Weeks, architect.

Satter building, San Francisco. Frederick H. Meyer, architect.

McNutt hospital and Wilson buildings, San Francisco. W. S. Schmolle, architect.

Residences for George E. Billings, Ralph Warner Hart, architect; Dr. Howett, Wright, Rushforth & Cahill, architects; Mr. Hyman, Havens & Toepke, architects; Mr. Levinson, Sylvain Schnaittacher, architect; Mr. Dolliver, Welsh & Carey, architects; Dr. Keefe, Henry Shermund, architect; Mr. Parsons, Salt Lake City, W. Moore, architect and Mr. Whitley of Ye Liberty theater, Oakland, Newsom & Frary, architects.

The Bexhill Casement may be compared to two wings of a folding screen which are pivoted at the ends into a surrounding frame and slide along channels let into the head and sill.

The channels being of solid steel, warping of the woodwork can not possibly affect them or in any way interfere with the running of casements.

The blocks which run in the channels and to which the casements are pivoted, are made of gun metal and can not therefore corrode, they are hollowed out on the underside which prevents them jamming and lessens the friction surface.

The following are some of its advantages:

Absolutely weatherproof.

Rigidly locked in any position and can not possibly rattle.

No racks, wheels, pulleys, cords, weights, or anything that can possibly give trouble.

Whole area of window available when wide open.

Unobstructed view from either side.

Set to catch the breeze.

(Continued on Page 126.)

Set to screen room from high winds.

Impossible for casements to be blown away; one wing braces the other.

Glass easily cleaned on both sides from within.

Especially suitable for exposed situations.

Rigidly locked at top and bottom, can not be opened from outside.

Perfect ventilation at night from above and below, draught proof at sides and locked.

Existing windows can be adapted.

Visalia School Competition

The following architects submitted plans for a $40,000 high school at Visalia: Benj. McDougall, San Francisco; F. S. Allen, Pasadena; Swartz & Son, Fresno; E. Mathewson, Fresno; Thayer, Visalia; Saeffel, Bakersfield; Walter Parker, San Francisco; Dolliver & Burki, San Francisco; Cumming & Weymouth, Oakland, and Morve L. Weaver, Visalia. The design of Mr. McDougall was accepted.

Extraordinary Veneers.

On one of his recent Eastern trips, Mr. A. L. White, president of White Brothers, hardwood lumber dealers at Fifth and Brannan streets, San Francisco, picked up several veneer flitches of a very peculiar grain in oak. It is curly slash grain and this configuration was evidently caused by some disturbance in the growth of the tree when a sapling. The grain shows a mottled effect like Hungarian ash but as the oak grain is much firmer and harder than ash the effect is heightened and the lines and figures are drawn out more sharply. White Brothers have had several panels made up to show the grain of this veneer and the lights and shadows and grotesque figures shown are really remarkable.

New Schools for Colma

Two new school buildings are to be built in Colma, and plans from competing architects will be asked for at an early date.