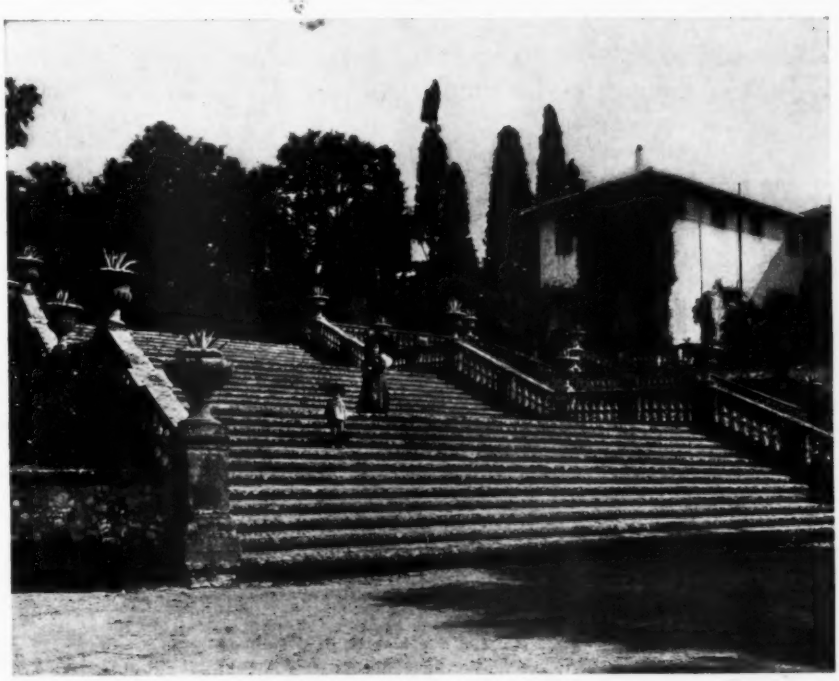
The AMERICAN ARCHITECT



DETAIL—VILLA TORTONIA, FRASCATI

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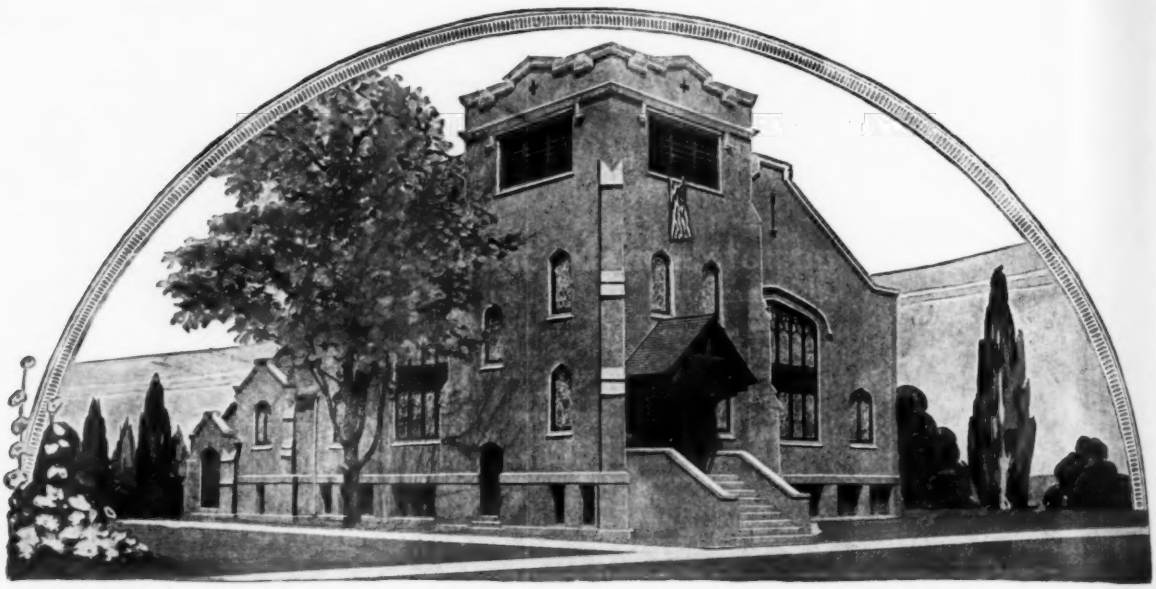

Grace Baptist Church, Binghamton, N. Y. Elfred H. Bartoo, Architect. Stucco finish on background of Bishopric Board.

The finish of a building is one link in the chain of construction. Any weakness in that link, any breaks or letting down of the finish and the value of the whole structure is weakened. Take a stucco finished building—let the stucco crack and break away from its fastenings and the rain beat in back of the stucco—how much and how quick it lessens the value of that building.

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In the years that Bishopric Board has been so generally used, stucco houses have become increasingly popular.

As an economical background that holds the stucco as long as the building lasts, Bishopric Board is unsurpassed.

It is wind, weather and vermin proof, a non-conductor of heat and cold, and a wonderful fire-resistant.

The principles embodied in Bishopric Board are as old as the building industry itself, and they are principles that time and experience have failed to improve.

It is their combination found in Bishopric Board that has made stucco-stability possible.

Bishopric Board is simple in construction—creosoted dovetailed lath imbedded under terrific pressure in Asphalt Mastic on a background of heavy fibre-board.

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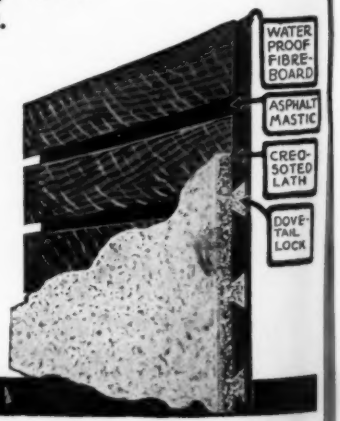
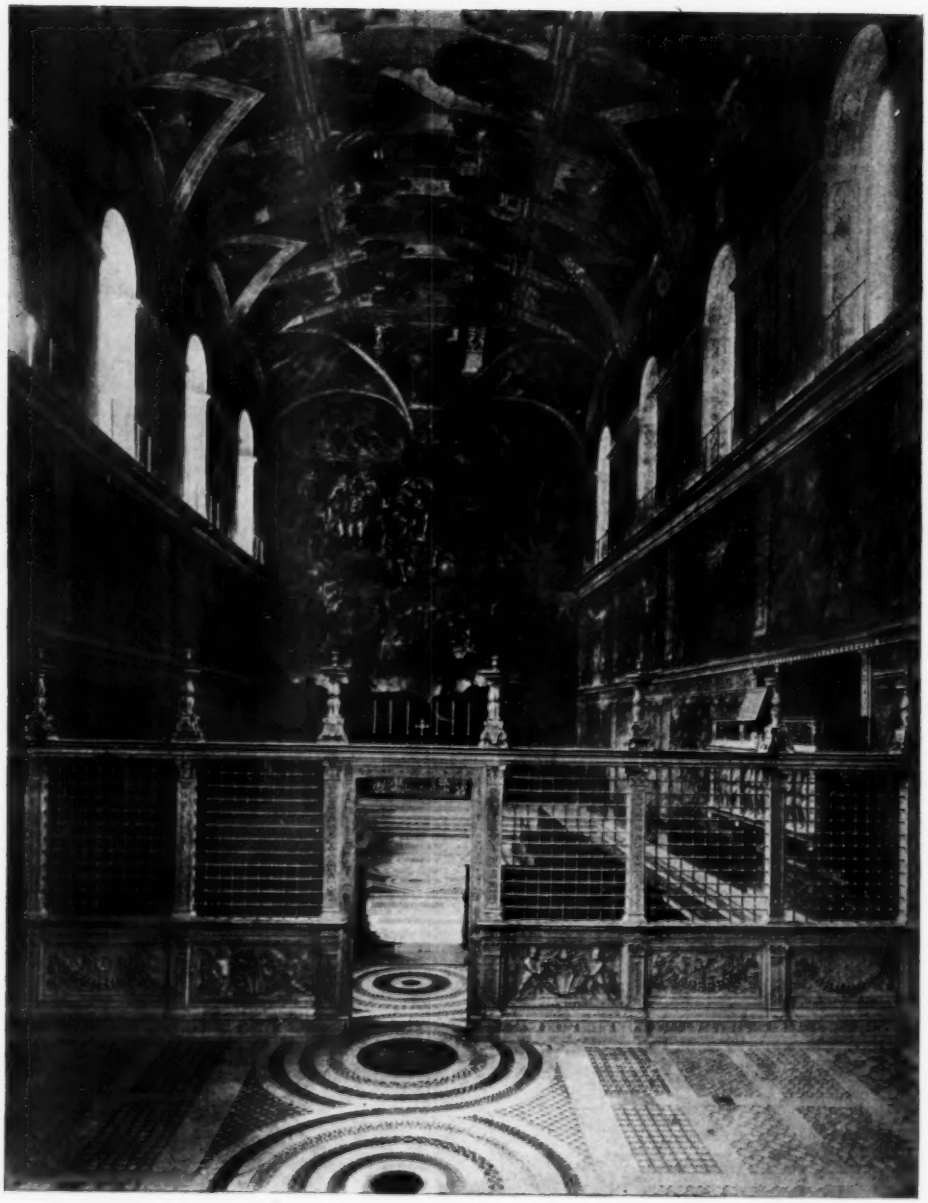
Write **today,** investigate for yourself, be convinced.





SISTINE CHAPEL, THE VATICAN, ROME

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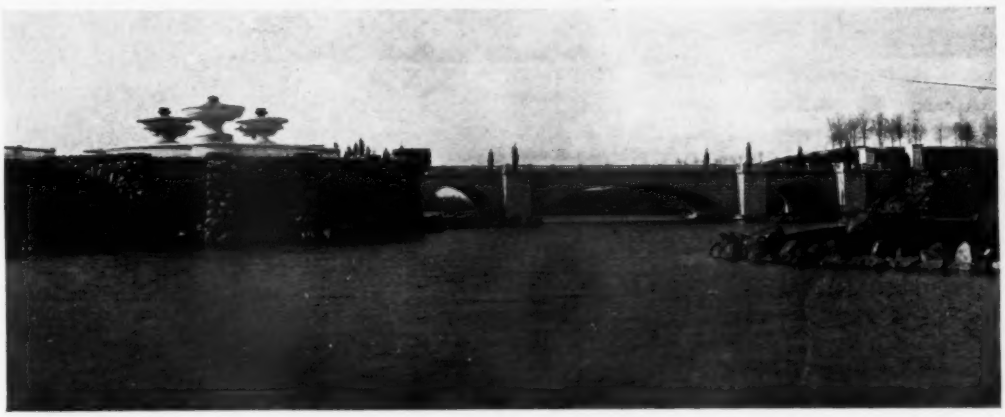


DUKE ESTATE, SOMERVILLE, N. J.

Concrete has been used extensively in the improvement of many private estates. It fits in well in combination with rubble masonry, or in fact with any other type.

Concrete as a Medium of Artistic Expression

By H. COLIN CAMPBELL, *Director Editorial Bureau, Portland Cement Association*

ART in architecture has been attained through many mediums. Among these is concrete, which perhaps permits wider range of expression in its field of use than any other single material that may be compared with it. It lends itself to decorative effects principally because of its plastic nature before hardened, and the limit of ornament or artistic expression that concrete will gratify is governed entirely by the good taste and ingenuity of the architect and actual worker with the material. The natural soft gray tones of straight concrete blend pleasantly with all outdoors. Almost any expanse of lawn forms a suitable setting for the swimming pool, pergola, and such lawn furniture as benches, flower vases and sundials. The added touch given by the landscape architect in planting or clumping trees and shrubbery finishes the setting. Entranceways to the home grounds, lamp posts and balustrades, porches, lintels over doorways and windows and panels in walls are concrete details or fixtures that can in no other way be made so satisfactorily unless it be with sculptured stone. Here concrete is given greater preference, because the modeling or molding of concrete is a shorter route than sculpture.

Concrete, while plastic, takes the shape or form of any mold in which placed to harden, so skill in using concrete depends largely upon the individuality displayed in making the molds or forms in which it is cast and in giving the object so cast the proper setting or a suitable place in the harmony of the whole design. Attempts made to express the artistic with concrete have sometimes resulted only in condemnation of the material. But this condemnation has been unjust because the attempt was not made by one who appreciated its possibilities, someone who did not know the true limitations or applications of concrete in its possible decorative or ornamental uses. We can find monstrosities anywhere expressed through the medium of almost any building material that one could name. Wood, stone, brick, tile and steel have all

been used to pervert the artistic, and no doubt because of these perversions an adaptable material has been unjustly condemned.

The architect requires not only a medium which will express in body and form the artistic creations of his mind, but wants one which also will put the stamp of reasonable permanence upon his work. The artistic is not worthy of endeavor unless it in a measure endures. There is no doubt that the explanation of the slow development of concrete in architectural structures is due primarily to lack of knowledge among architects of its possibilities. However, within the past few years these possibilities have been understood and appreciated more fully, and for that reason we see rising, here and there, monuments to the designer's skill in adapting concrete to the scheme which he had in mind. Designing a house of concrete is more than the mere combining of effects. It offers to the architect of ambitious ideals a medium for the embodiment in form of his artistic conception.

The almost endless adaptability of concrete has been time and time again expressed in entranceways or approaches to the private or public estate.

The handicap which concrete in architecture has suffered in the past has been the tendency of designers to impose on this medium principles of construction or attempted uses that were identified more with other building materials. Structures of brick and stone do not allow of great plasticity and can be modeled only in straight lines or apparent curved surfaces which have but little grace in their treatment. This necessitates resorting to balconies, inlays and artificial trimming or to fanciful designs in roof and gable in an attempt to relieve the stubborn severity of the material. It is true that many beautiful and pleasing effects have thus been obtained, but to attempt to apply such styles of architecture to concrete is a grave mistake. The fundamental principle which must control in concrete is simplicity. It matters not whether the subject be treated to express dignity or strength, or be molded into more ornate forms of the expression of charm and beauty. There must be no complex and irrelevant forms which more often than not detract from the simple grace of the structure and do nothing to please the eye.

A simple garden setting, in which concrete is admirably blended.

There is no other material which the architect has whereby he can allow himself such latitude of shade and surface finish. He may develop the cold, gray surface so attractive in a country home with its background of foliage; he can duplicate various panels as needed to relieve the monotony of plain surfaces; he can make these depressed or raised, can cause the surface to be modeled as desired and can secure almost

An example of irregular coursed stone masonry combined with precast concrete units to form a balustrade and the decorative features of it.

any color that fancy may dictate. The surface finish may be smooth or roughened, by any one of a number of easily applied methods.

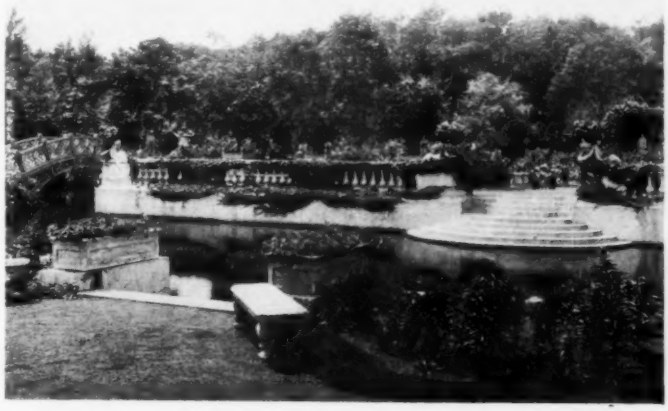
The texture of building material is a factor of the greatest moment and one which requires very careful attention at the hands of the architect. A finish that harmonizes with one design may prove both undesirable and unconvincing in another. A house or other building to attract and please must have individuality. Surface treatment must strengthen the impressions created by the lines of the structure, and in concrete the great variety of surface textures possible makes the development of this phase of expression practically unlimited.

Much of the ornamental in concrete is obtained through the medium of precast units. Panels, lintels, columns, the various parts of balustrades, sundials, lawn vases, etc., are samples of such units. These in turn are made from plain to ornate by varying the forms in which the units are cast. Unfortunately the tendency is often to attempt too delicate a tracery or too intricate a design, resulting in disappointment. Yet, in the various ways that concrete may be used for ornament, there are casting methods that permit results almost equal to the sculptor's achievements.

Some surface finishes are given after casting has been entirely completed. Others are partly arranged for when the materials are being selected. In small ornamental objects such as flower vases, sundials and garden seats, colored sands and selected aggregates such as marble chips and granite screenings are often used in place of the ordinary sand and pebbles or broken stone. After the concrete has hardened and the forms have been removed, the surface of the concrete is treated in one of a number of different ways to bring out the full effects of the selected materials.

The simplest form of surface finish that can be given to concrete is that secured by placing the material properly in well-made forms and insuring that coarse particles will not be exposed on the surface. Spading the concrete while placing next to form faces, and tapping or jarring the molds, will help to remove air bubbles that might form holes on the surface. This also causes coarse particles to settle back away from form faces and leave a surface as smooth as the forms themselves. But such a surface is rather monotonous. It is almost impossible to build large areas of forms so that the concrete will not reproduce joints, grain and other irregularities of the lumber or carpenter work on the surface.

In architecture the concrete is rarely left with the surface that it has when coming from the forms. An untreated concrete surface has a color due almost entirely to the cement. The sand particles that may be on or near the surface are masked by a coating of cement. To remove irregularities or impressions caused from form contact, the surface is often floated down with a stone or wood float. Forms are removed as soon as the concrete has hardened sufficiently to be self-sustaining or to per-



The garden or park pool is made more attractive by proper combination of concrete and shrubbery.

mit handling the object if reasonable care is used. Ridges formed by joints in forms are carefully chipped off, the concrete surface is thoroughly wet down and rubbed with a carborundum block, being kept wet constantly. The earlier the surface is rubbed after form removal, the easier will it be to remove any surface irregularities due to form inequalities. In other words, the concrete should be rather green. The rubbing removes the inequalities and fills the pores and small cavities, giving the surface a uniform appearance. Such a treatment is proof against the pitting and scaling that frequently results from painting on a cement and water paint, which is not to be advocated as a surface finish.

By far the most attractive surface finishes that can be given to concrete are those which are in large part arranged when preparing the concrete mixtures. Selected aggregates used instead of sand will control, almost as desired, the color of the finished surface. Marble chips, granite screenings, crushed feldspar, mica and mica spar, crushed slag, white sand and white cement in various combinations permit an endless variety of tone. Such concrete mixtures are prepared and placed in the usual way. When the concrete has hardened so that forms may safely be removed the surface of the concrete is gone over in one of several ways to expose the aggregates. When selected aggregates are used the surface finish is obtained by washing off the film of cement that coats the particles, thus exposing their surfaces in the surface of the concrete and in that way revealing their color. If the forms are removed within twenty-four hours after placing the concrete in the mold it is usually possible to wash off the surface film of cement by merely scrubbing the surface of the object with a stiff bristle brush kept wet with water. If, however, the concrete has become too hard to permit exposing aggregate surfaces in this manner an acid wash is used. Generally a solution consisting of 1 part of commercial muriatic acid in 3 or 4 parts of water is applied

Delicate tracery such as ordinarily would be left to the stone cutter's art is readily molded in concrete. The more intricate patterns are reproduced by casting the material in glue molds. The units are afterward assembled just as is any other masonry.

with a brush, and a light scrubbing is given until the film of cement is removed from the aggregate particles. When this has been done the surface must be washed immediately and thoroughly with clean water so that all trace of acid will be removed and its further action prevented. Unless this is done continued action by the acid will loosen some of the aggregate particles. The treatments just described are given largely to plain surfaces, such as on lintels, columns, block, or similar units.

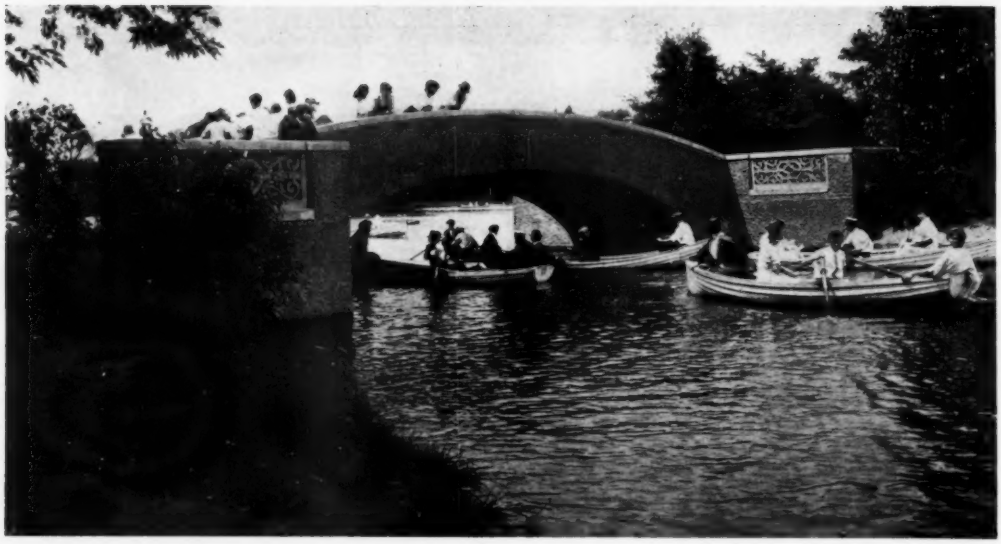
Surface finish is also obtained by using facing mixtures, that is, if a surface by means of colored aggregate is desired, then the concrete mixture containing such aggregate is used only for the face of the object, and back of this mixture the ordinary concrete is used in which common sand and pebbles or broken stone are the aggregates. Lintels and concrete block are often faced this way since reduced cost follows. Variations in color and texture of surface which are to be secured by washing or otherwise exposing the aggregate can be made almost without number by combining two or more selected aggregates. For example, a mixture of yellow and white marble chips or a mixture of gray granite screenings and black crushed slag, with a little mica spar or mica, are examples of possible variations. Concrete made of such mixtures has a beautiful surface texture when the film of cement is removed by scrubbing, either with water or the acid solution, depending upon the age of the concrete. Usually with the lighter colored aggregates, white Portland cement is used, and with mica spar, white marble or mixed colored aggregates. The resulting surface has an unusual sparkle and brilliancy.

Another method of finishing concrete surfaces is to tool them. In fact, thoroughly hardened concrete made of materials selected with a view to the tooled finish surface can be cut almost as stone can be sculptured. In preparing for the tooled surface it is necessary that particular attention be paid to selecting the aggregates and still greater attention to proportioning the concrete mixtures so that there will be sufficient cement to fill the voids of air spaces in the bulk of aggregates and thus firmly bond all particles into one solid mass. If mixtures are lean in cement there will not be enough bonding or binding material to prevent the small particles of aggregate from being dislodged or broken out when tooling the surface. For tooled surfaces or sculptured work on concrete it is necessary that the concrete be allowed to harden for a greater length of time than for the washing or scrubbing methods. It must have an almost flint-like hardness so that the aggregate particles will not be broken out of the surface, as it is the particles themselves that must be tooled to give the desired effect. Concrete block or other units that have been steam-hardened first are the best for tooled finishes. Although concrete may be tooled by using chisels, just as marble and other stone are carved, the usual tooling consists of hammering with a bush or pean hammer such as is used by stone dressers. In the hands of a good and careful workman with such a tool the aggregates are slightly cut, thus disclosing their color and giving the concrete surface an appearance like that of cut stone. Best results come from selecting an aggregate of uniform texture and hardness so that it will yield everywhere alike to the tooling treatment.

Concrete surfaces may be given a polish similar to that obtained on marbles and granites. The degree of polish depends, however, upon the aggregate used and then thorough grading so that the least possible amount of cement necessary to bond the particles will be required. Examples of such finish may be seen in so-called mosaic or terrazzo floors. For the polished concrete surface best results follow exposure of as great an aggregate surface as possible—the closest approach to 85 per cent that can be attained. In other words, the finished surface should show 85 per cent aggregate particles at least, as against 15 per cent or less of cement.

Variation in surface finish of concrete can also be secured by means of colored pigments, and colored pigments can be combined with selected aggregates. If a richer tone is desired coloring matter such as red oxide of iron may be added to the cement and pink or red granite chips used as aggregates. Washing, scrubbing, tooling or otherwise treating the surface to remove the surface film of cement reveals the desired color. Still another way of varying the color of a concrete surface is to immerse the concrete object in some solution that will dye or stain it. Naturally the application of this method is confined to objects which can be so immersed. In other words, a broad expanse of concrete surface could not be successfully colored by painting on the dye or stain.

In aiming at color effects secured in part by mixing colors with the cement it is very essential if permanent tints are secured that only reliable pigments be used. The cement, sand and coloring matter are mixed together dry, and it is advisable to experiment a little to find out how much color is needed to give the desired shade. When water is added to such a mixture the mortar will appear considerably darker than the final surface will be when thoroughly hardened. By mixing five pounds of colored matter with a sack of cement the following colors are obtained: Raw oxide of iron will



The decorative possibilities of concrete are combined here in the precast unit panels and the slap-dash surface finish.

Concrete has been used extensively for the open-air theater. Possibly no other medium permits such pleasing reproduction of the forms of ancient times as does concrete.

give a bright red; roasted iron oxide will give brown; ultramarine will give a bright blue; yellow ochre will give buff to yellow; carbon black or lamp-black will give a gray or dark slate; a mixture of equal parts of carbon black and red iron ore gives dull reds. In all cases the addition of mineral colors causes some loss of strength, but this is not of great importance in ornamental work. In general only mineral colors are recommended. As regards permanence of effect, blues and greens are not reliable and will fade in course of time. Sometimes a concrete surface is finished by sand blasting. This method consists of impinging against the surface a stream of fine sand from a jet or nozzle under high air pressure. The small sand particles striking the surface wear from it the fine film of cement, thus exposing the color and texture beneath. In laying up concrete walls the effect of stone courses can be produced by placing V-shaped strips or battens horizontally and vertically on the inside face of forms. However, this effect is not to be encouraged since concrete should not be used to imitate any other material. It has an individuality that should be allowed to express itself fully. The old type of concrete block may be mentioned as an example of misguided effort in using concrete. Here a broken rock face appearance was effected by the use of different types of face plates in the molds in which the block were cast, and it is hard to imagine a more monotonous, displeasing surface finish than the imitation stone obtained in that manner.

While not concrete in the true sense of the word, stucco finish is usually classed within the adaptations of concrete. Its use is so familiar that description of it need not be given here. Stucco also is susceptible to some of the treatments described for mass concrete. Color, either artificial or as obtained by selected aggregates, is within the range of stucco. The rough cast finish comes from finishing with trowels covered with carpet or burlap. Slap-dash finish is secured by throwing on the final coat with a wood paddle, and pebble-dash finish is obtained by throwing clean pebbles on to the fresh stucco of the final coat before it has commenced to harden. Pebbles should be uniformly about one-half inch in greatest dimension, round and of gray color. They should be washed thoroughly clean and be wet when thrown against the mortar of the last coat. If the color of the pebbles is not to be exposed they may be wet with a cement and water paint immediately before throwing against the surface and are then more certain to adhere to the surface.

By combining concrete and the landscape architect's skill, terracing of slopes may not only be wonderfully improved but may be much more attractive.

"Somewhere in France"

THE AMERICAN ARCHITECT CLOSE TO THE FIRING LINE

The following interesting letter has been received from Private Carl C. Briggs, Camouflage Section, A. E. F., the son of Herbert B. Briggs, architect, Cleveland, Ohio:

The Editors, THE AMERICAN ARCHITECT:

"Somewhere in France" on a rainy Sunday afternoon a mud-bespattered motor car pulls in, and a sack of mail arrives—much to the joy of a handful of men stationed there. We all gathered around while a sergeant called out the mail. My name was called, and what should I receive but three copies of THE AMERICAN ARCHITECT. Echoes of the past, how it was appreciated!

Later I learned from my father, Herbert B. Briggs, of Cleveland, Ohio, that you had so kindly sent them. They have been appreciated by a number of draftsmen and other men of the affiliated arts who are in the Camouflage Section.

The British Architect and Advertising

The Architects' and Builders' Journal of London comments very constructively on the action of the American Institute with reference to advertising. The fact, as suggested by a contemporary, that this action "permits architects to place their services before the public in such proper manner as their education and a due regard for their professional dignity might suggest," gives the former publication occasion to remark as follows:

These references to education, propriety and professional dignity appear to have been inserted with the object of softening the blow to the conservative section; for it is hard to see what other purpose they can serve, and there would have been more grace in the tacit assumption that American architects would use their new liberty with the utmost circumspection, if they use it at all. In the report presented by the committee appointed to consider the subject there is a passage worth quoting for the light it sheds on the mood in which the anti-advertising canon was repealed: "Is there any valid reason why," the report asks, "in this age of democratic endeavor, the American Institute of Architects should cling to this or any other relic? Is it not time that we consider carefully, not only the abolition of the canon on advertising, but how many more of the worn out rules, undemocratic distinctions, and un-American assumptions that we can get rid of?" Looked at squarely, the attitude of the professional man with respect to advertising is rather ridiculous. Why is he afraid to advertise? Because the tradesman does it, and the architect would be ashamed to be seen in such company? No; the architect dare not make that snobbish confession. Well, then, of what is he afraid?—of his brother architects? He may fear the ostentatious austerity of the total abstainer; or he may be still more afraid of the blatant vulgarity of the whole-hogger, who will crush all rivals by illustrating everywhere and every day (including Sundays) the "rotten little cottages" or other brutal buildings which he has devised with a diabolically cunning insight into the psychology of the "profane and vulgar crowd." But he is most afraid—and his fear amounts almost to superstitious dread—of what unimaginable horrors may burst upon him if once the sacred tabu is broken. A gentleman, it has been said, is chiefly distinguished from meaner men by the things he does not do. And nowadays there is only one thing that the professional man does not do—he does not advertise: at least, not with candor and directness.

On the related subject of "signing" buildings, the Institute convention at which these recommendations were brought forward suspended judgment pending a further report from the committee having the matter in hand. Probably there are some little niceties of detail to settle; for we seem to have a dim recollection that when the great question of "hanging-out a shingle" was raised, some of the "chapters" of the American Institute were minutely particular as to the size, shape and material of the "shingle," and as to the style of the lettering and the tone of the announcement; "shingle" being in this connection the American for a doorplate or its equivalent.

If the practice of signing buildings is allowed, it may perhaps be well to prescribe certain limitations to the privilege; for while the majority of American architects would probably be content to "sign" with two drawing-pins and a visiting card, there may be others whose ideas soar to illuminated sky-signs, with the architect's name flashing out in three colors on letters three feet tall. Most British architects, we imagine, would rather not sign them: three excellent reasons for abstention being that the design is quite commonly a perversion of the architect's idea by the client or the builder; that even when his design has been faithfully rendered, he is not satisfied with it, and is by no means eager to attach his name to it; and lastly, he hopes that his work will show progressive improvement, and that therefore the time may come to him, as he knows it has come to others, when one cannot regard one's early work without shuddering.

St. Joseph's Hospital, Far Rockaway, N. Y.

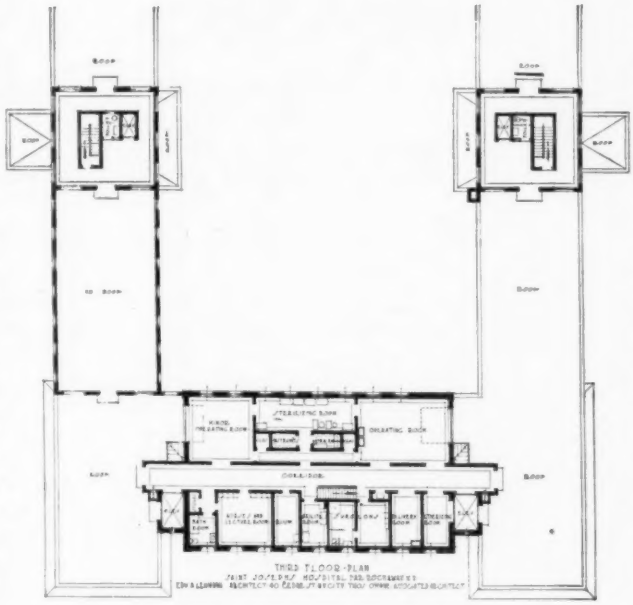
By Edw. A. Lehmann, *Architect*

SAINT JOSEPH'S HOSPITAL is a modern fireproof building, designed to care for general medical and surgical cases of both sexes. It serves a population of 25,000, without regard to race or creed.

The property is 190 by 250 feet. A comprehensive plan for the utilization of the entire property was prepared, but for reasons of economy was not entirely carried out.

The plan in general provided for a central administration building, flanked on each side with double-ended wards, with a service building in the court. Over the latter building is a chapel. The total accommodation is 128 ward beds and 28 private beds. The portion now built was constructed at a cost of $165,000, indicating a cost of $210,000 for the entire scheme.

The Administration Building consists of three stories and a basement, with north and south wings of two stories and a basement. The double-ended wards have two stories and a basement. Underneath the entire basement floor is a 3-ft. air space securing ventilation by windows which are operated from the outside.



OPERATING FLOOR PLAN.

Description of the Plans

The basement of the Administration Building contains an admitting room, where patients are prepared for admission to the emergency or receiving wards. A receiving ward takes care of all patients admitted after certain hours, in which they may be placed temporarily at night or detained for preliminary examination. Here also is the X-ray room, which will in the future be transferred to the operating-room floor. Both wings have rooms where soiled linen is received through chutes from the upper floors, toilets, store rooms and a room used for delirious patients. The walls of the latter are sound-proof, with double doors and a window protected by heavy wire grille. In the south wing is a small emergency operating room, dressing, examination and waiting rooms.

Across the basement corridor is the central kitchen, well lighted and ventilated. From it all food is served in bulk for removal in food cars to the serving rooms. Here also are a fuel room, refrigerators, scullery, storeroom, a room for the preparation of vegetables, help's dining rooms and a serving pantry for the sisters', nurses' and internes' dining rooms on the first floor. In the service portion of the building is the diet kitchen.

On the first floor of the Administration Building are the business offices, a house pharmacy, waiting room for visitors of private patients, reception room, rooms for the house staff and dining rooms for the staff.

The north and south wings of the Administration Building on first and second floors are used for private patients. The solariums of wings are used only by the private patients. Here also are the serving and linen rooms, clothes chutes, drying closets, blanket warmer cabinets and closets for stores. The examination rooms located here are used in connection with the public wards. These rooms may be used for recovery rooms for patients returning from the operating room or as dressing rooms for discharged patients. The isolated group of rooms on second floor of north wing is used for the maternity cases. The delivery or laboring room in connection with this ward is located on the third floor of the Administration Building.

The operating suite of the third floor consists of a major and a minor operating room, with a sterilizing room between them. From the passage connecting the operating room, the instrument and work rooms are entered. Directly across the corridor is the etherizing room, delivery or labor room for maternity cases, bath and nurses' room, surgeons' dressing and preparation rooms, utility and a recovery room.

In the basement of the double-ended wards are located the rooms and toilets of the help. The room adjacent to the pantry of the north wing is used for receiving and storing supplies and in the south ward adjacent to the pantry are sewing rooms. The waiting rooms in the center portion of the wards are used for visitors of ward patients; the entrance to these waiting rooms is from the side driveways. Here also is a room where the soiled linen is received through chutes from the upper floors. The room at the extreme end of north wards is used for a carpenter's workroom and for splints, etc.

On the first floor are the men's medical and surgical wards. The inside dimensions of the wards are 30 ft. 0 in. by 56 ft. 0 in. In the center portion of double-ended wards are the utilities, from whose corridors are entered the bath and toilet rooms and the serving rooms. Each serving room has large sinks, a refrigerator, steam table, gas plate, china closet and tray racks. Here also are clothes chutes for sending soiled linen to the basement, closets for brooms and slop sinks, and a fire escape stairway leading to the basement and roof. The future double-ended ward when completed will contain a children's ward.

The utility or sink room, which is entered through the nurses' work rooms, is centrally located and equipped with good-sized work and slop sinks, pan racks and warmers, specimen cabinet, incinerator and sterilizers.

The nurses' work rooms, which are located between the sink room and the wards, contain blanket warmers, drying closets, medicine cabinets, sinks, nurses' toilet and gas plate for the preparation of poultices, etc. The plate-glass window between the work room and wards gives the nurses an unobstructed view of the ward so that the nurse can, even if engaged in her duties, see all the patients in the ward. During the winter nights, after the windows have been opened, this room is used for the night nurse's station.

On the second floor are the women's medical and surgical wards. The plan of these wards is practically a duplicate of the first-floor wards. In the women's bath rooms the showers have been omitted and bath tubs used instead.

The section at the extreme end of the wards is used for the public patients. In this section are a fire escape stairway, toilets and a dining room for convalescent patients. This room may be used for a day room where patients may meet their friends.

On top of the wards are the roof gardens. The center portion is roofed over and the sides enclosed in glass casements. Part of the roof of the south wing will be used for out-of-door treatment and convalescents; the parapet wall will be carried up about 8 ft. 0 in. high, and windows set in wall openings. This permits the patient to enjoy an unobstructed view of the surrounding country for many miles without being exposed to harmful drafts.

The Interior Finish

The wood trim of the interior is oak. No projecting members are used. The trim of doors finishes on composition plinths. No window trim is used; the plaster wall returning against window frame forms a jamb. The frame is finished with a small cove set in an angle formed by the plastered jamb and frame. The window stools throughout are bevelled. The doors are of the sanitary flush type and the edges are rounded on the stop side. The door stop is coved to fit the doors.

The dressers are set 3/4 in. from the wall, without backs; the tops are sloped and the composition base of room continues around dressers.

All angles formed by plastered walls are coved and corners rounded. The floors are of tile, marble, concrete and composition. All rooms have a sanitary cove base of tile, concrete or composition.

The stairs are cast iron, the strings and risers are coved at the top of the treads. No moulded members are used and all angles wherever possible are coved and corners rounded.

Equipment

The building is equipped with the most modern light signal system, and each private patient's room has a public telephone connection.

No mechanical ventilating system is used, except in special rooms. Natural ventilation is obtained in the wards by the use of transom sash over the windows; the sash is hinged at the bottom and swings into the room. The transom sash has metal shields at the sides, which throw the flowing-in cold air upward to the ceiling. The heat generally is direct radiation.

All basins are set free from the wall; a marble wall slab in back of basins extends 6 in. each side of the basin and from the top of the room base to 1 ft. 6 in. above the top of the basin. All bath tubs are of the built-in type.

The style of architecture is that of the Italian Renaissance. The exterior walls are of light brick, with trimmings of mat-glazed terra cotta. The roof of the main building and tower is of red Spanish tile.

The building was designed and planned by Edw. A. Lehmann, now associated with the firm of Palmer & Hornbostel, architects, New York City.

The Contagious Ward of the Morristown Memorial Hospital, Morristown; N. J.

Palmer and Hornbostel, *Architects*

THE planning of a building for the segregation and care of contagious diseases in a community of moderate size presents many interesting problems. The fluctuating population of such a hospital has inspired numerous attempts to plan "elastic," "flexible," "extensible," and "adjustable" units. The present plan is one more such attempt.

In the planning of a building of this character, one of the principal objects is the limitation of the cost of maintenance during periods or seasons when contagious cases are few. If, for example, it is desired to provide a maximum of forty beds for a community having from twenty to forty thousand inhabitants, the plan should make it easy to put a large part of the building out of commission whenever the number of cases falls to a minimum.

The best results can be obtained by treating the contagious disease unit not as an independent hospital, but as a department of a general hospital. Under these circumstances, the contagious ward can share many of the facilities of the main plant.

The unit which is here presented is part of the Morristown Memorial Hospital at Morristown, N. J. The building is situated on the grounds of the general hospital, and is set well back from the road and on the brow of a cliff; thus the building and its occupants are removed from any direct contact with the surrounding community. The long axis of the building runs approximately north and south; sun exposure is thus provided for every room.

The largest single ward contains four beds; in addition there are two-bed wards and numerous single rooms. Each patient's room may be entered either from the terrace, which surrounds the building or from the central corridor.

The present medical staff proposes that the hospital shall be operated on the "contact theory" of infection, which permits a single, properly trained nursing staff to care for a variety of diseases at the same time. If, however, there should occur an epidemic of a particularly severe type, the patients belonging to the group could be segregated in one section of the building, and all direct contact with the occupants of the remaining parts of the building eliminated. The central corridor is so arranged that the hospital may be operated as a single forty-bed unit, as two units of twenty beds each, as two units of twenty-eight and twelve beds, respectively, or as three units of twenty, twelve, and eight beds, respectively.

The admitting room, discharge room, nurses' entry and exit, doctors' entry and exit, supply room, and surgical dressing room communicate with the auxiliary corridor, and have not been duplicated; the utility rooms, diet kitchens, and chart and linen rooms are offshoots of the main corridor and are duplicated, each arranged to serve one end of the building.

A novel feature is the arrangement of the "door-windows" of patients' rooms. Direct access to the terrace from these rooms was desired. The smaller rooms were too narrow to permit the use of both door and window. It was decided to use a double sliding sash for the upper two-thirds of the opening, and, for the lower third, a solid section consisting of two hinged half-doors. This combines the advantages of the wide-open French door in summer and affords the protection of a standard double-hung sash in winter.

Food and laundry service are to be furnished by the main hospital.

While there is an air space beneath the entire first floor, the cellar is fully excavated only where necessary. In the southerly extremity of the building, where the basement is well out of ground, three single rooms have been arranged for the servants. In the middle basement are the boiler room, a storage room, a room for the reception of infected material, sections for clean mattresses and patients' clothes, and a morgue.

The second story covers only the central part of the building, and is designed for the use of nurses. It contains eight double rooms, with common bath and toilet, a single room with private bath and toilet for the head nurse, a recreation room, and a sleeping porch. Nurses and others can obtain access to the second floor without entering any infected part of the building; therefore, this floor may, if desired, be used as an annex to the general nurses' home, or for other purposes apart from the contagious service.

Radium Laboratory, The Memorial Hospital, New York

PALMER AND HORNBOSTEL, *Architects*

THE radium laboratory of the General Memorial Hospital was erected in 1916, through the generosity of Dr. James Douglas, as a repository for a large quantity of radium donated by him and for research into its physical and therapeutic qualities. The amount of radium collected here is one of the largest in use for experimental and therapeutic purposes, and the building is designed to afford protection to this rare element and to supply all necessary facilities for its application.

The structure consists of three stories, with a wing on the first floor connecting it with the hospital proper. Each floor has two large rooms, one in front and one in the rear, and the one-story wing has five small rooms. The construction is entirely fireproof; the exterior, by its large windows, accentuates the scientific purpose of the building.

On the first floor, the large front room contains a fire-proof and burglar-proof vault, in which the radium is kept, and a well-equipped workshop for the manufacture of the applicators and instruments needed in the treatment of patients. An adjoining small room in the wing contains an apparatus for drawing off the emanations of the radium, direct use of the radium not being employed. As much of this apparatus consists of glass tubes, its frame work is imbedded in solid concrete to reduce to a minimum vibration and possible fracture. Measuring instruments for radium are kept in an adjoining small room to remove them from the exciting presence of the large quantity of radium emanations in and about the emanation apparatus. The three remaining small rooms in the wing are a retiring room and two examining rooms equipped with proper furniture and lavatory facilities. The large rear room on this floor contains a most modern autopsy room equipped with a Delano ventilating table, with separate electric fan, and with accessory sinks. In this room is also a four-chambered morgue, with an individual motor-driven refrigerating plant. The autopsy room, from the standpoints of cleanliness, sanitation, natural and artificial lighting, ventilation, and modern equipment is intended to represent the last word in rooms of its purpose.

The second floor in front contains a research laboratory for the radium department while in the rear, directly over the autopsy room, is a fully equipped pathological laboratory having easy access to the room below.

The third or top floor in front is used and

equipped for experimentation on animals, and in the rear is an ideally equipped chemical laboratory.

The roof is flat and is surrounded by a parapet of moderate height. Here are kept the houses and cages for small animals used in experimental work. The main stairs connect directly with the roof by means of a pent house which is roofed with a large skylight to give illumination to the three flights of stairs.

In general the laboratories are equipped with ample sinks, ventilated closets for fumes, taps for water, gas, and electricity, and with plumbing so located in the floor as to permit any desired distribution of laboratory tables and apparatus. The interiors are of face brick, therefore light, clean, and indestructible, and the floors are of composition, laid without joints, giving a reasonably soft and impervious surface. Natural light and ventilation in abundance are had on two sides of each room.

For the proper consideration of many technical questions involved in this building and the expert guidance to their correct solution, the architects are indebted to Dr. James Ewing, who most freely made accessible to them his wide knowledge of the subject to which the building is devoted.

Allocating 200,000 Soldiers

IN a talk before the Commonwealth Conference of the University of Oregon, Thornton T. Munger of the United States Forest Service discussed the problem of allocating our soldiers after the war. The probable necessity of finding lands for 200,000 men, many with families, after the war formed the basis of his discussion.

"The colonization of returning soldiers on agricultural land is the time-honored method of restoring to civil life those who have no regular occupation or trade. It has been estimated that 50,000 out of every million returning soldiers will wish to locate as farmers on new agricultural areas. Already a number of ways of effecting this colonization have been proposed.

"In western Oregon, exclusive of the National Forests, which are almost wholly rough mountain lands permanently unfit for agriculture, there are about 20,000 square miles. In this area there are now about 700,000 persons. This is an average of 35 per square mile. In this territory west of the Cascade range are now 2,800,000 acres of unimproved logged-over lands, and approximately 40,000 acres are being added each year. Of this area it may be assumed that 50 per cent is agricultural. This 1,400,000 acres would be enough for 18,000 families.

"The majority of the cut-over lands are idle-nonproductive wastes. They are growing neither timber crops nor agricultural crops.

"The homeseeker needs the guidance and initial help of the disinterested Government in establishing his farm home. Western Oregon has a peculiar problem for the settler, in that most of the land now best suited for colonization is covered with stumps. Some of the land would cost more to clear than the land would be worth under present economic conditions; and so there is a point, known only by the experienced expert, where the cost of clearing overbalances the productive value of the land.

"It is natural to expect that any governmental colonization project would cover but a small part of the logged-over lands of the State. There will inevitably be considerable individual pioneering on idle lands. I would advocate, therefore, that such a classification of unused lands be extended ultimately not only to the territory which is to be embraced in immediate governmental colonization projects for soldiers, but that it be extended to cover gradually all of the idle lands. Thus the State would be in a position to advise private owners as to the disposition of its lands, and to advise homeseekers as to where they might settle with the best chances of success.

"The classification of the logged-off lands is an initial step in two great projects which will add enormously to the healthy growth and prosperity of our commonwealth—first the colonization in large projects by the returning soldiers of the truly agricultural land; and second, the extension of the practice of forestry under public management of the lands which are, at last analysis, best suited for that purpose.

"Legislation is needed, and needed promptly, if we are to be ready for the returning soldier. If the Federal Government is to provide for acquiring land for colonization projects Oregon should give her active support. If not, Oregon should take the initiative in providing for great colonization projects."

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VOL. CXIV AUGUST 21, 1918 No. 2226

The Function of a Standard

STANDARDIZATION is a matter of growing importance in this country; the significance of this trend is beginning to be generally appreciated. There is a danger, however, in carrying such work to an extreme, perhaps not so much in establishing the standard as in its application. Articles of a mechanical kind can, and should be, standardized and manufactured without deviation. This reduces cost of production and many elements of waste.

Standards for buildings, however, present a different aspect to the subject. Elsewhere in THE AMERICAN ARCHITECT is illustrated the work accomplished toward standardizing the construction and planning of school houses. Here the principal elements of such a building are measured with reference to each other and noted in terms of percentages. These percentages give the fundamental basis for proportioning the various parts of the building and should be adhered to within reasonable limits.

Buildings are as individual as persons through the influence of what is known as "local conditions"; and it follows that no two buildings of this kind should be duplicates in detail, but merely in principles of design. The purpose of these standards, then, as applied to buildings, is to furnish a rational basis upon which to construct the plan; if used intelligently the result should be satisfactory.

In buildings, as in human beings, a strict adherance to standards is fatal, as it destroys the power of imagination and initiative. This will be well demonstrated in the case of a warring nation that boasted of its high state of efficient standardization. It appears that this standardization and scientific measuring of men has reduced its soldiers to automatons, incapable of individual action and entirely without imagination, initiative and freedom. The same will result in the practice of architecture if standards are literally adhered to; it will be the intelligent exception that will prove the ability of the designer.

The standard is a necessity, but is only intended for intelligent use. The work of preparing standards for buildings intended for every use, except residential, possibly, is a matter well worthy of the attention of the architect.

A Test of Merit

A CORRESPONDENT to a London daily paper directs attention to the fact that the monument to Charles I, in Trafalgar Square, is carefully protected from air raids by a rampart of sand bags and corrugated iron, while the statues of Nelson, Gordon and other celebrities stand uncovered and unprotected. He asks if the reason for the care on the one hand and the seeming neglect on the other is not because the effigy of Charles I is really a good work of art, something worth while preserving, while the others are such poor examples as to cause indifference as to what may happen to them. As an actual test of merit this instance is of much moment.

Fortunately we in America have not had to take precautions against aerial raids. If we did we should, in addition to all the perils of invasion, be confronted with the horrors of the majority of our municipal monuments, for most of it would undoubtedly be left to brave the falling bomb, and but little would be worth the effort to protect it.

Lectures to Wounded Soldiers

IT has now become a custom in England, in the cities and towns wherein are located hospitals for wounded soldiers, to hold lectures on topics that will not only serve to afford a change in the wearisome monotony of days of convalescence, but which at a time when the men are more receptive to impressions, are in line with the problems that many are trying laboriously to solve. The object of the lectures now being delivered in the English hos-

pitals is to interest wounded soldiers in arts and crafts which they may follow, even if disabled, after the war.

As a preliminary to the more thorough courses of re-education to be undertaken when the soldier or sailor has been discharged from the hospital, these lectures serve the very good purpose of stimulating them to a consideration of the thing they shall be able to do when they return to civil life, and they further suggest, in a way in no other manner possible, a line of effort that, in view of past experience and general preference, he may find best suited to him.

Similar courses of lectures, if held in the hospitals in this country, would serve an equally good purpose. Many men, particularly among the profession of architecture, who have not been able to take active part in any branch of our service, either at home or abroad, could find in the making of short, practical talks to our wounded sailors and soldiers a congenial work which would be a very valuable service to their country.

It is suggested that the various architectural organizations could arrange for these lectures to good advantage.

Again Rehabilitate the Old Building

IN THE AMERICAN ARCHITECT of April 3, 1918, editorial comment was made on the importance to the architect and to the producer of building materials and appliances of rehabilitating old buildings. This not only gives employment to the architect, but it increases the revenues of older buildings by making them more useful at a time when new construction work is greatly curtailed.

The architect for a library built about sixteen years ago was recently asked by its trustees to bring the system of lighting up to the modern standard of perfection. These trustees had noted the advance made in artificial lighting since the construction of this building, and, appreciating the necessity of the best possible lighting for buildings of that kind, very properly decided on this betterment.

The great advance made in the production of high power lamps during the past few years and the scientific knowledge developed as to their use renders out of date almost any lighting system more than four or five years old.

With the necessity for the architect's considering and practising his profession as a business, it is perfectly proper for him to seek out his old clients and show them the great improvements made in the past few years. He can suggest betterments in many ways that will add to the working value or comfort of these older buildings. This will not react to the discredit of the architect, as the buildings when erected represented the best knowledge and skill of that day.

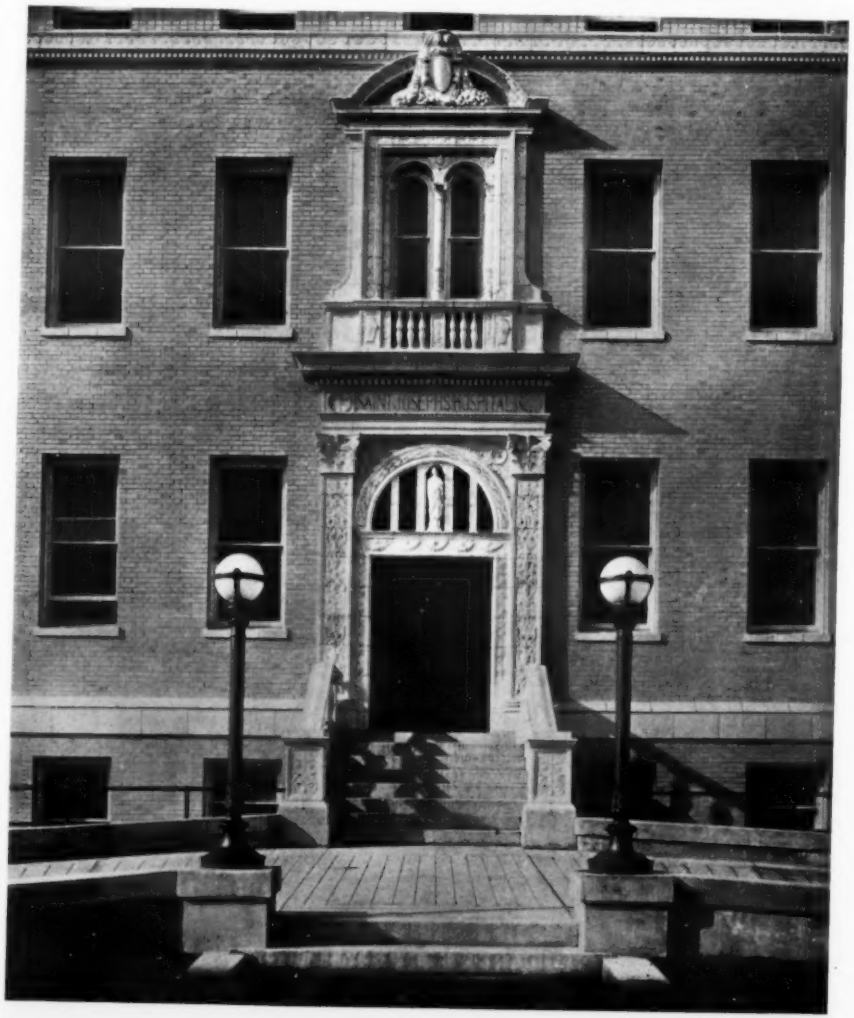
Granting that this is true, why should the client discover better methods and suggest and order improvements? Why should not the architect, with every legitimate right, make these suggestions himself? By so doing he cannot only keep his organization working, but render valuable aid to all the allied peoples affected by his activities.

Your old library, church or school; residence, apartment or hotel; factory, warehouse or store building; office building, courthouse or jail, can all, no doubt, be bettered as to lighting, heating, ventilation, plumbing, elevators, rearrangements of plan, or in a multitude of other ways. Such undertakings are to be sought in these times and by going over his list of buildings of a few years ago the architect will readily note opportunities for betterments, after which he will serve both his client and himself by suggesting them.

PLATE 61

SAINT JOSEPH'S HOSPITAL, FAR ROCKAWAY, N. Y.

EDWARD A. LEHMANN, *ARCHITECT;* THOMAS O'KANE, *ASSOCIATED ARCHITECT*



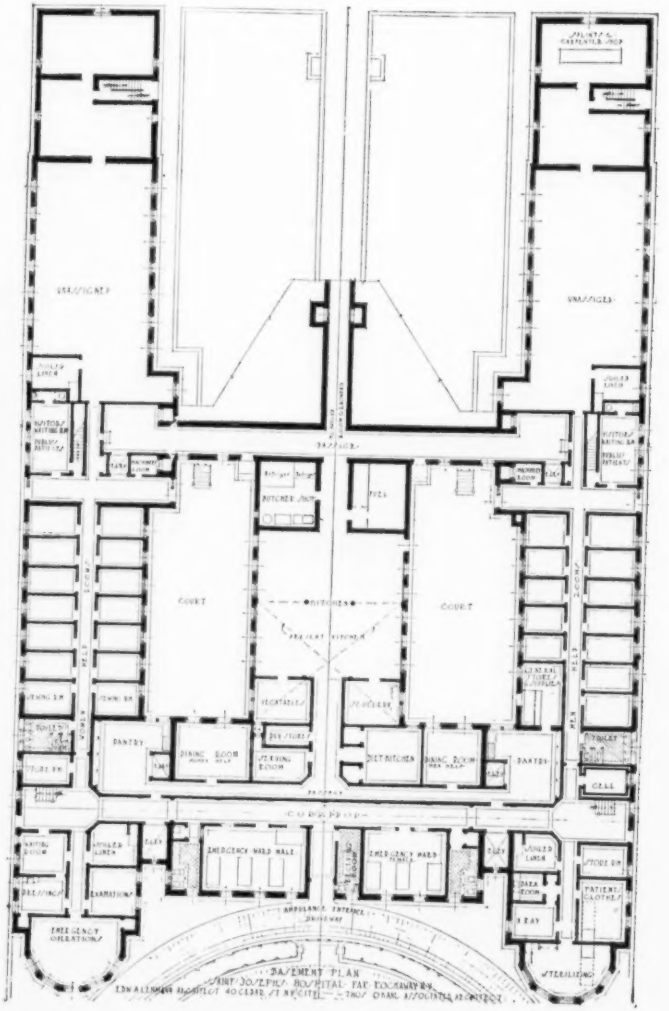


PLATE 62

SAINT JOSEPH'S HOSPITAL, FAR ROCKAWAY, N. Y.

EDWARD A. LEHMANN, *ARCHITECT;* THOMAS O'KANE, *ASSOCIATED ARCHITECT*

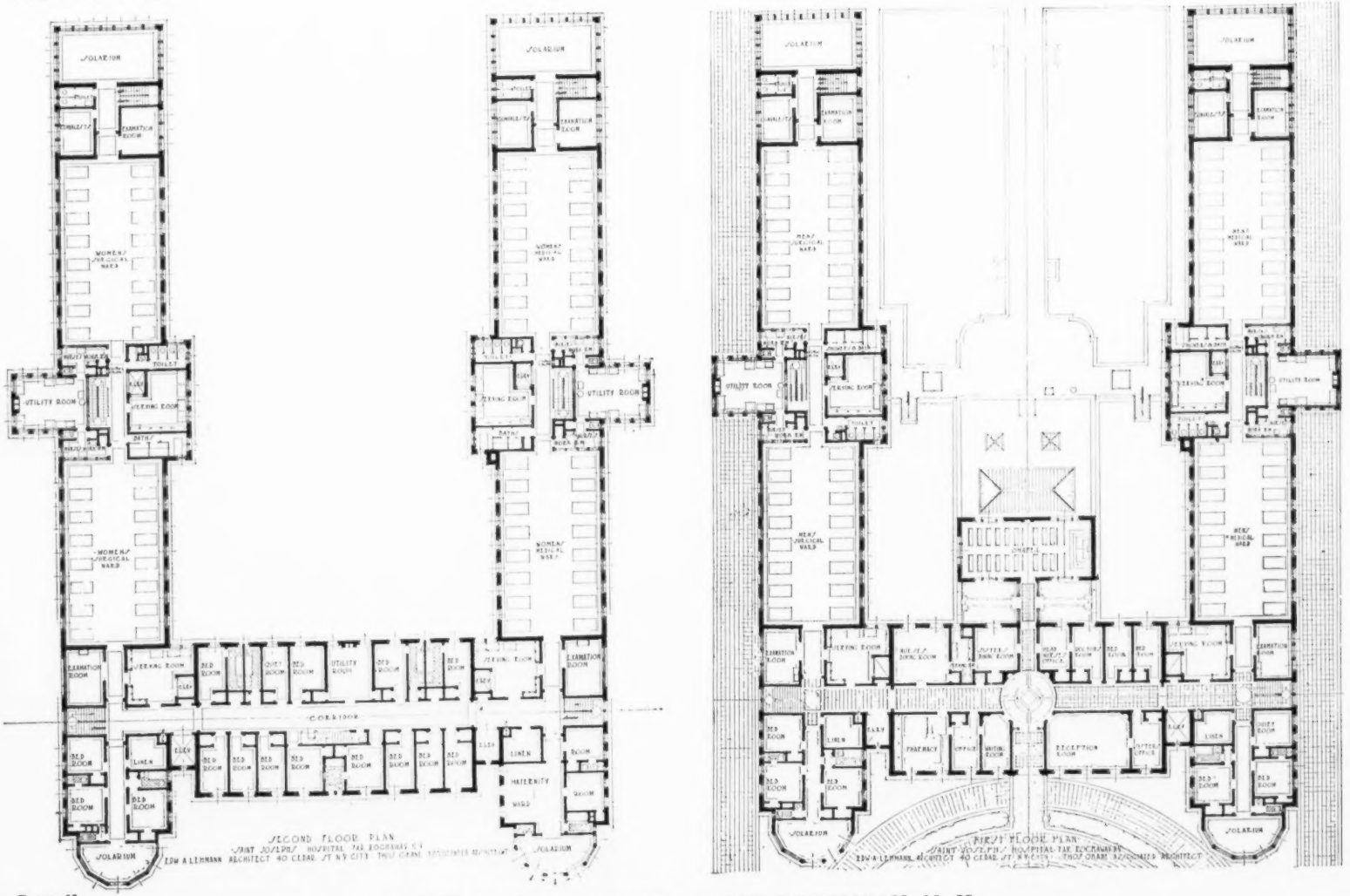


PLATE 63

SAINT JOSEPH'S HOSPITAL, FAR ROCKAWAY, N. Y.

EDWARD A. LEHMANN, *ARCHITECT;* THOMAS O'KANE, *ASSOCIATED ARCHITECT*

PLATE 64

RADIUM LABORATORY, MEMORIAL HOSPITAL, NEW YORK

PALMER & HORNBOSTEL, *ARCHITECTS*

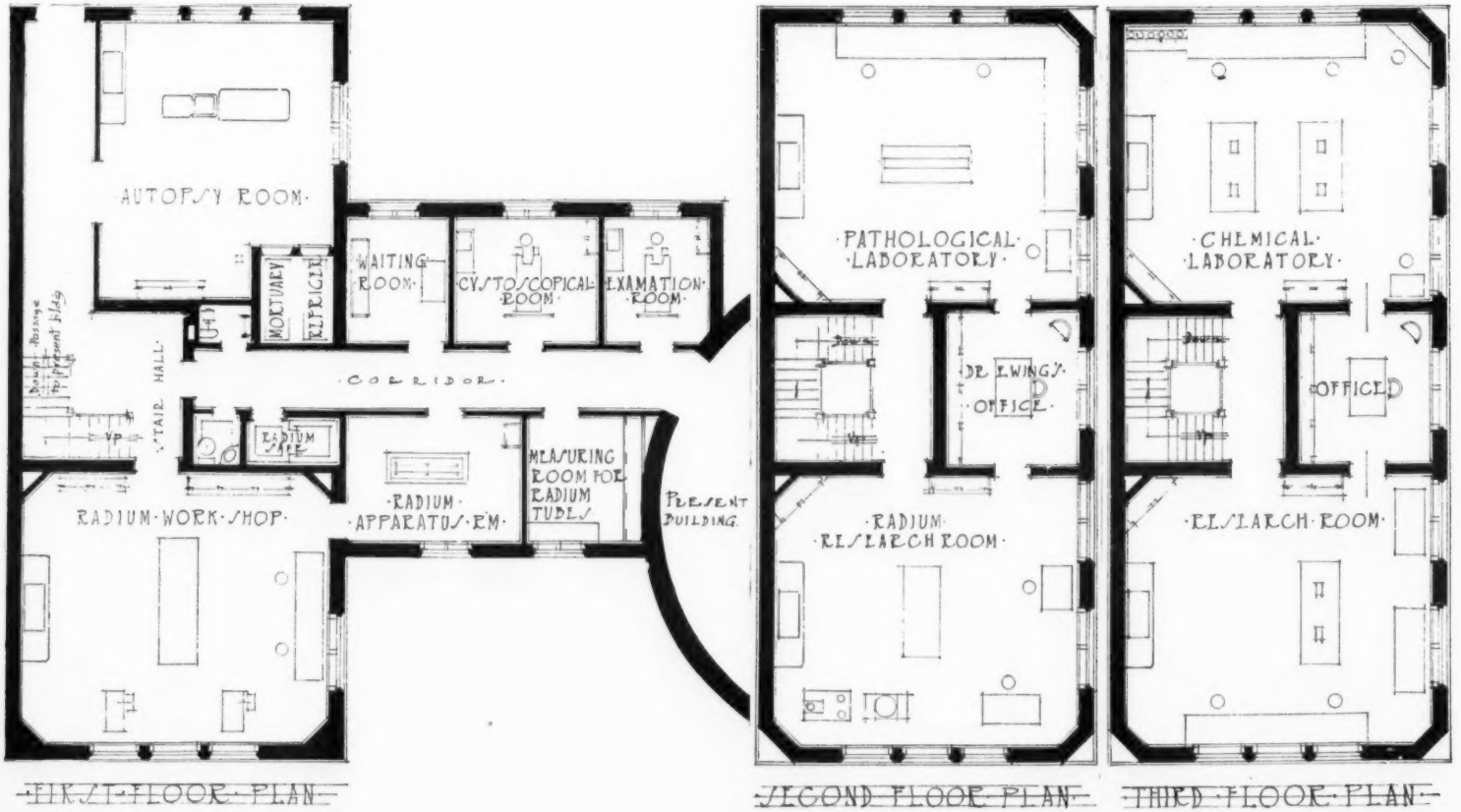


PLATE 65

RADIUM LABORATORY, MEMORIAL HOSPITAL, NEW YORK

PALMER & HORNBOSTEL, *ARCHITECTS*

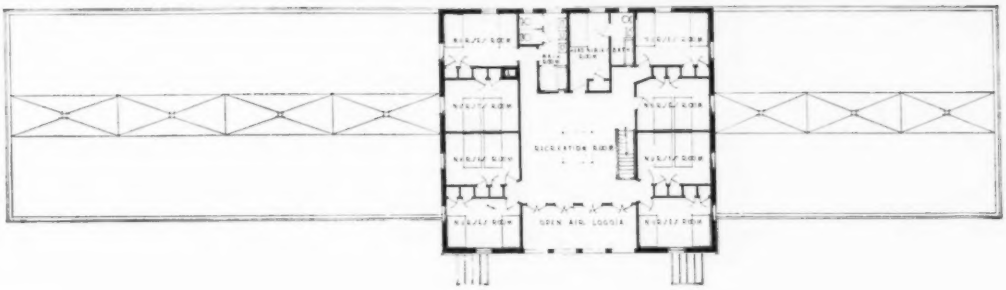
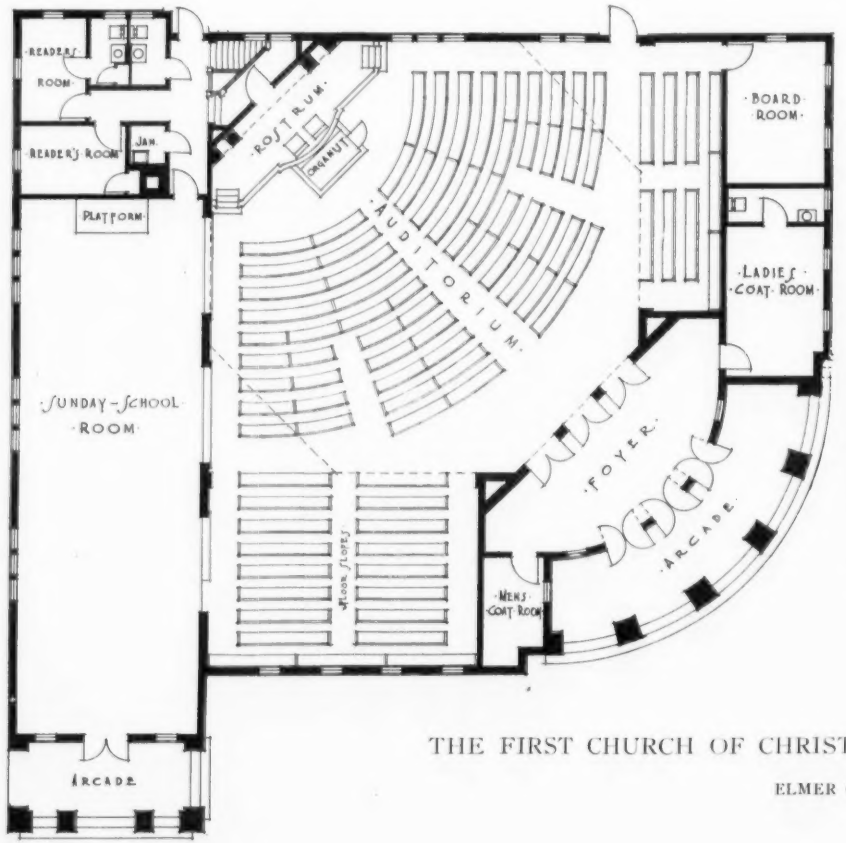


PLATE 66

CONTAGIOUS WARD, MORRISTOWN, N. J., MEMORIAL HOSPITAL

PALMER & HORNBOSTEL, *ARCHITECTS*



THE FIRST CHURCH OF CHRIST, SCIENTIST, PALO ALTO, CALIFORNIA

ELMER GREY, *ARCHITECT*

PLATE 67

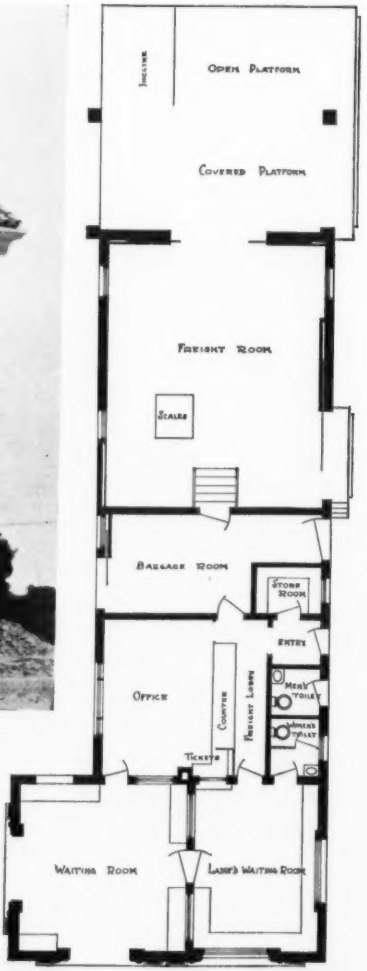


PLATE 68

PACIFIC ELECTRIC RAILWAY STATION, CLAREMONT, CAL.

ROBERT H. ORR, *ARCHITECT*

Vast Housing Plans Complete for Hampton Roads District

The Department of Labor authorizes the following:

The Bureau of Industrial Housing and Transportation announces the completion of plans for housing projects in the Hampton Roads district. This is probably the most congested district in the United States.

The navy yard at Portsmouth, the Newport News Shipbuilding & Dry Docks Co. at Newport News, and the Railroad, Food and Fuel Administrations have depots there. The war population is estimated at from 50,000 to 70,000.

The housing corporation is planning four developments in the region. The first is designed for the Norfolk district, near the Army and Navy bases. About 500 houses of five and six rooms each will be built for white workers.

The contract for the construction of about 1000 houses adjacent to the navy yard at Portsmouth, constituting the second development, has already been let. This project also includes schools, shops, a fire station, and a motion-picture theater.

In Portsmouth about 300 houses will be built for the colored workers. These will be a story and a half in height, will consist of four and five rooms, and will be provided with all modern sanitary conveniences. The plans have been completed and will go out to contractors soon.

In all of these developments the problem facing the housing corporation is larger than the mere building of houses, because of the overburdened condition of all public utilities.

In the Newport News section a large group of houses is nearing completion. These include the development for the Newport News Shipbuilding & Drydock Co., illustrated in THE AMERICAN ARCHITECT of Aug. 7. They are being built under the direction of the Shipping Board. The homes thus provided, however, will fall short of the actual need, and accordingly the Bureau of Industrial Housing and Transportation is engaged on a survey to determine the extent of necessary additions. It is expected that housing will have to be provided for a large number of families of colored workers, as well as a considerable addition to the new community already in existence at Hilton.

Home Registration Service

The problem of housing the workers in munition plants and other war industries is becoming so acute because of the delays inseparable from so large a construction project as that now being worked out by the Bureau of Industrial Housing and Transportation that it has been found necessary to organize a Homes Registration Service for the purpose of utilizing all available existing housing facilities. This work is progressing rapidly, and already the service has been established, or is in process, in twenty-three cities.

The Homes Registration Service is made possible by co-operation between the Bureau of Industrial Housing, the Council of National Defense, and state and local defense bodies and the United States Employment Service. In every community vacancy canvasses are being made by the local council. Data concerning the general location of the houses with reference to nationality needs, as well as to prices, are being accumulated.

The directors of the local Homes Registration Service, composed of representatives of local organizations, pass on these questions and refuse to list houses or rooms which would impair the efficiency of the war workers until quarters are made wholesome. The national government thus is enabled to communicate direct with each local group.

In every city where the Homes Registration Service has been established war workers are presented with lists of rooms, apartments, and houses which have been accurately classified in accordance with the probable needs and desires of the applicants. Every effort to protect the health and morals and to insure comfort is being made. In addition to the services already in existence, measures are being taken to build up organizations in other cities.

Fire Waste

The subject of fire waste in Canada has been investigated in a most exhaustive way, and the results of this research published in a book, printed and circulated by the Commission of Conservation of Canada. It may be secured for fifty cents by addressing the Commission at Ottawa.

The problem of the prevention of further waste of natural and developed resources is of paramount importance to the entire American Continent. In undertaking this investigation the Conservation Commission of Canada has performed an important service.

It is conceded that further continuance of the enormous loss of life and property through fires will vitally affect our economic future. As a means of conservation it is perhaps one of the most important issues, and since in the majority of cases loss by fire is preventable, it will only require definite action, backed by concerted effort, to reduce this

enormous drain on natural resources and created wealth.

As proof that much of this large annual loss is really due to preventable causes, there is presented, in a tabulation of letters secured by the Commission, the following accurate information:

Of 211 fires, whose origins were classified under the head of carelessness, fifty-five were due to the careless handling of matches and sixty-six to absolutely careless habits in houses and factories.

Under Insurance, in 137 reported cases the "moral hazard" is largely responsible for the bulk of the loss, while in building construction of 128 cases, it is shown that the loss was mainly occasioned by failure to comply with code regulations, complicated by lax supervision.

It causes a feeling of insecurity to learn of the large annual loss that is due to inadequate laws in certain communities. In view of the yearly mounting total of the national fire loss, it is incredible that there should be in any part of this continent a place where there are not sufficient laws to control the acts leading through carelessness to loss by fire.

Classified separately from building construction is a large item of loss due to faulty installation of electric systems, furnaces, heaters and gas appliances.

In short, it requires but a superficial examination of this report to become impressed with the fact that in Canada, as well as in the United States, so large is the annual fire loss, due to causes that are really preventable, as to raise the question that on this American continent we are in these matters the most careless and profligate of people.

To Support Government Housing

By resolution unanimously adopted the City Council of Davenport, Iowa, recently pledged its support to the Government housing plans in that city. Funds which the Government asked for to make street improvements will be raised by bond issue or otherwise.

Washington Navy Yard Housing for Employees

The Department of Labor authorizes the following:

Fourteen dormitories, together with a mess hall and kitchen, constitute the first portion of the housing development to be undertaken by the Bureau of Industrial Housing and Transportation at the Washington Navy Yard. Plans have been completed and bids requested for the construction of these buildings, which are designed to accommodate about 500 navy yard workers.

In addition to the foregoing, it is proposed to erect fourteen apartment buildings and 300 houses to meet the needs of navy yard workers and their families. Plans for these structures are also well under way and it is hoped that actual construction will begin within the next few weeks.

Safety Code for Foundries

A committee on safety, sanitation and fire prevention of the American Foundrymen's Association, at a recent meeting held at Rochester, N. Y., completed a safety and sanitation code to be put into practice in foundries identified with that association. This code will be presented at the next annual meeting of the association, to be held at Milwaukee, Wis., October 27. The committee expects at that time to have completed also a fire prevention code.

The sanitation code, which will affect nearly 250,000 employees, directs that all foundries provide wash rooms, shower baths, metal lockers, drying rooms and drinking fountains. The fire prevention code rules that all foundries must be fireproof and equipped with sprinkler systems. Each foundry must have a fire department with periodical fire drills and inspection. Fire hose is to be used only to extinguish fires and not, as is the custom in many foundries, to wet down the castings.

Colgate Warehouse Finished

War Department Announces Completion of Quartermaster's Depot

Official announcement was made recently by the War Department of the completion of the big Quartermaster's warehouse at Colgate, near Baltimore, for the handling of war supplies for the army.

It was also announced that the Government has spent to date $218,000,000 in the construction of quartermaster's depots and warehouses. When completed these projects will provide 33,000,000 sq. ft. of warehouse space, additional wharves and piers and improved harbor depths. Warehouses are now under construction in twenty-four of our large cities; some of them are nearing completion.

Analysis of Egyptian Pigments

In the Metropolitan Museum of Art, New York, is the tomb of Perneb, originally erected at Memphis about 2650 B. C. *Chemical News* in a recent issue prints an account of an analysis of the pigments used, undertaken by Maximilian Toch. The pig-

ments are red, yellow, blue, green, gray and black. The idea that the red used by the Egyptians was red ochre appears to be erroneous; the red found in this instance proved to be hematite, which contains much more iron oxide than the ochres. All the yellows used on the tomb were composed of the native ochre, which is clay colored with iron-rust. The Egyptian blues are beautiful colors, ranging from a light sky-blue to a dark ultramarine. A microscopical examination of the dark blue showed it to be of the nature of a powdered "smalt" glass or porcelain; this powder has been rubbed into the pigmented surface and allowed to set with Nile clay or mud, which, being slightly alkaline, acts as a cement, and has both setting and binding properties. A greenish-blue pigment examined was composed of azurite, a hydrated carbonate of copper; while the green pigment was a mixture of malachite, azurite and clay. The gray was limestone mixed with charcoal or carbon, and the black was a carbon black, composed of charred wood or burnt bones. It has been assumed that the Egyptians used white of egg as a binder, but no trace of any albuminous binder was found in the specimens under notice; they did, however, show evidence of the use of glue or gelatin. The pigment in two paint pots, evidently thrown away by the workmen, was found to be hematite mixed with limestone and clay.

The Choice of Materials

The following extract from an article in the *Carpenter and Builder* of London touches on a question of use of local material in building that architects in this country might consider with good results.

When we travel afar in this country we find a change in the general character of the landscape, but many times in sections where local materials could be employed to splendid advantage there are the same features of material that were so prominent in another city a hundred miles and more away. The article states:

"Hardly a village remains in England now without a blemish of some sort due solely to this one great defect of modern building, namely, the use of wrong materials. In the West and North England possesses the cold granite of the northern world, and throughout her length and breadth streaks and patches of the finest building materials known to man. Our Portland stone is superb, our hand-made bricks, too; and yet this very economic advantage of England's smallness of size is her undoing when considering her modern architecture, for the very short distances that one has to travel to experience change of scenery and material, makes it possible, and nowadays likely, for a brick house to be placed in a stone country and a stone house in a brick country."

War conditions, tending as they do to restrict this undesirable transference of materials, may lead to an improvement in this respect.

When Is a Park Not a Park?

In the latest bulletin of New York's Municipal Art Society C. W. S. is justifiably bitter in his comment on the waste of opportunity in the so-called city parks of New York. "When is a city park not a park?" he asks, and answers: "When it ceases to offer either grass, flowers, or the shade of trees; when, for instance, it has a large granite basin or fountain without water, which is gradually broken up and carried away; when, at one end it harbors a ship and at the other a bomb-proof cairn for explosives; when one-third of it is roughly fenced off for a few years while the subway burrows its slow course within a yard of the grass surface, destroying for the time the plantation and preventing for all time the growth of shade trees over it, and when this subway seizes more of its precious space for entrances; when the few surviving trees, uncared for in recent years, are left to die limb by limb and break down gradually, and their place is filled by no new shade trees; and when, in consequence, such a forlorn patch of barren ground and concrete as this has become stands year after year through the hot summers neglected, dusty and shadeless; in a word, when its name is Union Square. The nursemaid in Punch being asked by the little boy at the station: 'What is a junction?' replies: 'A place where two tracks separate.' With equal truth this square is to us a place where our ideal of a park and its reality separate."

Irish Marbles

A large variety of colored marbles exists in Ireland, varying from white to pink and dove and from green to black. The different colors are sometimes found intermingled, especially in Connemara serpentine, and some very striking specimens for decorative purposes have been quarried.

Many Irish marbles have been used in architectural work and have well stood the test of time. The use in exteriors of certain Irish marbles, which did not weather well, led to a general condemnation of all classes of Irish marble that was wholly undeserved. The demand for marbles is not, at this time, very great, but these marbles are again in favor in such cases where the cost of importation does not militate against them.

The Explosives Regulation Law

General information and rulings for the enforcement of the federal law regulating the manufacture, distribution, storage, use, or possession of explosives and their ingredients has been issued by the Government in pamphlet form, and includes a list of the local United States explosives inspectors appointed by the President. Members having to do with inspection work should get in touch with the Government inspectors in their localities and assist in the surveillance of explosives. The pamphlet may be had without charge of the Government Printing Office, Washington, D. C. Ask for Public No. 68, 65th Congress, H. R. 2932.

Agreement Reached on Construction of Watercraft

At a meeting of the War Industries Board, July 31, decisions were reached to the effect that all contracts for watercraft construction will be cleared through the Emergency Fleet Corporation and the War Industries Board. Each Government agency shall prepare its own plans and specifications to fit its needs, adopting as widely as possible the uniform standards and working to eliminate unnecessary conflicts in orders, supplies, competition and other causes of delay.

Apollo Hall, Old New York Building, Taken by Government

Apollo Hall, one of the oldest buildings of east side New York, at 127 Clinton Street, has been leased by the Government for a labor bureau.

This old building has seen a diversity of uses. When it was built in 1828, it was one of the finest public halls in the city. It was then called Clinton Hall; it was surrounded with trees and was the scene of many fashionable gatherings. The name was changed to Apollo Hall in 1871. The old building has been the scene of many political campaigns, such men as Presidents Garfield and Cleveland, and other notables, having made addresses there.

Brooklyn Museum Receives Valuable Cloisonnes

The Brooklyn Museum has recently acquired, through the gift of Charles P. Avery, collector of Chinese works of art, a large assortment of wall vases and a number of additional pieces of cloisonne. Among these is a large screen of teakwood and enamels from the Imperial Palace at Peking.

The wall vases number eighty-two, and since no other public institution in the United States is known to own more than three, the Brooklyn Museum may be considered exceptionally fortunate. These vases have been the choicest feature of Mr. Avery's home collection. Needless to say, their value is very great.

The English Conception of the American Workingman's House

A recent writer in the London *Daily Mail* gives an alluring description of the American cheap small house. Inasmuch as many of the features described in the article quoted are to be found in any of our better industrial housing projects, it is possible that our workingmen are more fortunate than they know.

The article relates how, with courage worthy of his calling, a professor in one of our universities, forced to accept the usual shameful salary offered to men of mind the world over, moved into one of the model houses built for workingmen's families. It adds:

It is one of the most successfully arranged interiors from the point of view of comfort and simplicity that could well be imagined, and after struggling for years with the quaint conceptions of European builders I could almost forego their charms for the convenience of a workman's model cottage. It is very much in miniature, to be sure, but what more could a professor expect for £3 a month within walking distance of a great city university?

The flower-boxes that greet one at the entrance are part of the property, and their perforated zinc bottoms drain the moisture on to tiny flower beds beneath. Inside, a simple hat-rack (for so it calls itself in the United States) has become part of the wall; the space under the narrow stairway is an umbrella-stand. The vestibule floor is concrete, the others all yellow pine boards, requiring oiling only, or rugs; there is nothing so unhygienic as a carpet in so small a space.

To the right is the professor's living room—this, in some workmen's economics, might be regarded as the "Sunday room." The simple mantelpiece, the permanent book-shelves, the window-seat and inside shutters have saved some furniture.

In the dining-room the dresser and cup-racks make it possible to carry on with only the addition of table and chairs.

The kitchen is a dream for a happy housewife; a permanent coal-stove attached to a boiler which supplies the entire house with hot water is the main feature, but space is allowed for a gas range for

the summer months, for, of course, there is gas throughout the house, including the cellar. A drainboard for dishes is hinged to a model sink, and on lifting this board a stationary wash-tub is revealed, with its taps and drain. On the concrete cellar floor is the usual heater—the furnace fire—with its fittings and flues which carry the heat to every room in the house.

Upstairs there is a complete bathroom. The bath is at last taking its proper place in the home life of the world at large. It took an interminable time to wedge its way into the heart of things, but today the several bedrooms are ranged around it, giving equal opportunity to every member of the little family. There are no dark bedrooms in the American small house, and each one has its built-in wardrobe, which helps us to forget a none-too-distant time when so-called poor families hung their clothes at the back of a kitchen stove, around which they huddled to keep warm.

This, the writer declares, is a fair sample of the cheap small house built all over the United States.

Building Used in Prehistoric Horology

In the walls of the prehistoric Casa Grande in Arizona, there are two pairs of holes, about an inch and a half in diameter, bored through walls four feet thick. They occur on opposite sides of a great central room. They are so arranged that one standing in a dark first floor room behind the central room may look through the innermost hole, across the central room and through the outermost hole at the sky. One pair points due east. The other pair points north at a declining angle.

There is a theory that these holes form what might be called a seasonal clock. Twice a year, once as the sun works north and once as it works south along the eastern horizon, it rises in line with the eastward pointing holes and for one morning, for possibly three minutes, throws a bar of light into the dark inner room.

From this the ceremonial calendar could be dated and certain festivals would fall on the same day year after year. One is reminded of Stonehenge in England, where the sun at its summer solstice shone down a long alley of stone monuments upon an altar placed in the center of a series of circles of stones. The age of the Casa Grande is uncertain. Moderate estimates are that it was inhabited 600 years ago, while others are of the opinion that it dates back 1000 years or more. However ancient it may be, there is distinct evidence of its being the most recent of its group.

Personals

The firm of Gove & Walsh, architects, 306-7-8 Boston Building, Denver, Col., is dissolved. Thomas F. Walsh, formerly of Grove & Walsh, will continue to practise at Suite 404, Boston Building, Denver, Col.

Lemuel Everett Wilmarth, artist and editor, died at his home in New York City, July 27, at the age of 82 years. Professor Wilmarth was in charge of the schools of the National Academy of Design for twenty years. He was also prominent as founder and editor of the *New Earth*, a Swedenborgian publication, first issued in 1872.

Charles Henry Hart, authority on historical portraiture, died at his home in New York City at the age of 70 years. Mr. Hart was widely known for his posthumous discovery of Gilbert Stuart, and for several noted controversies in which he engaged on subjects of historical portraiture.

Professor Richard Norton, archæologist, and one-time head of the American School of Classical Studies in Rome, died in Paris, Aug. 2, from meningitis, after one day's illness. Professor Norton conducted an archæological investigation in Central Asia in 1903 and visited the Cyrenaica in 1904 and 1909. He was in 1910 and 1911 director of the expedition to excavate the ruins of Cyrene, under the auspices of the Archæological Institute of America and the Boston Museum of Fine Arts.

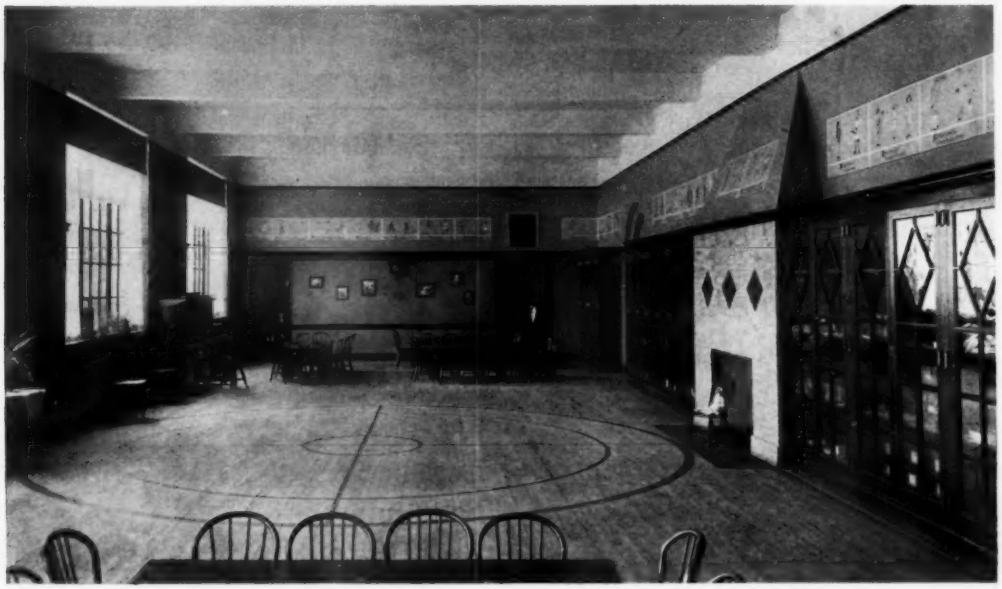
In 1914, Professor Norton organized and became the head of the American Volunteer Motor Ambulance Corps, which served on the French front from 1914 until it was taken over by the American Army in 1917.

Professor Norton had received the order of the Legion of Honor from the French Government as well as distinctions from other allied governments.

Wilfred E. Griggs Dead

Wilfred E. Griggs, architect, died at his home in Waterbury, Conn., on July 24, after a short illness. He was 52 years old and had practised his profession in Waterbury since 1889. During his career he designed many of Waterbury's most important buildings, including public buildings, residences, business blocks, manufacturing buildings, etc. He was a member of the American Institute of Architects and was one of the leaders in his profession, and as a citizen was held in highest esteem. The business will be continued by the estate for the present.

Department of Architectural Engineering



LINCOLN SCHOOL, TOLEDO. EWDIN M. GEE, *ARCHITECT*
An excellent example of light distribution suitable for a kindergarten.

Light in the School House

In Two Parts—Part I

A BUILDING has a direct influence on the welfare of its occupants. This has become a well-established belief among the more progressive manufacturers and is receiving attention generally. This consideration may have been prompted originally by a selfish interest in the effectiveness of the workers, but it is now being extended to a realization that it is a matter of right dealing which the workman has a right to demand. Great progress has been made in this respect in the industrial field and its influence is being felt elsewhere.

As a rule the producer is first considered, as it is largely a commercial proposition, and it is a realization that the child is a commercial factor in embryo that makes at least a selfish appeal. As in the case of the industrial operative, this appeal has been broadened along humanitarian lines and including a growing belief that some things are theirs by right.

Such societies as the National Education Association have done much work in this field as it applies to the schoolhouse. Among strictly technical societies, the Illuminating Engineering Society has formulated a code of lighting school buildings. This is one of the most important elements of schoolhouse design, ranking equally with the heating, ventilating and sanitary arrangements. The original purpose of a school building is to house a teaching process and the effectiveness of this process is

vitally influenced by the physical surroundings, consisting of the building and its equipment. The child is especially susceptible to the effect of these surroundings, and therefore they are of the greatest importance.

The society measures the relative importance of light by stating that 10 per cent of the 20,000,000 school children in the United States are found to have defective vision. Their work, being accomplished through the use of the eyes, depends on proper light for its performance. The lack of this causes eye-strain, resulting in functional disorders, near-sightedness and other defects of the eyes. There are other contributing causes in the form and size of the desks and seats, but this is of relatively minor importance.

The old-fashioned school with the small wooded window giving inadequate light, the stove and no wardrobe facilities.

The daylighting of a school building is generally of more importance than the artificial lighting. The vast majority of such buildings in this country are so located that they are not used at night for school purposes and the hours of operation are such that there is little need for artificial illumination. There is a growing tendency to use the schoolhouse during the evenings and thus make the plant more productive of good. Considering educational activity as a production operation it looks unreasonable to invest such enormous amounts of money in plants that only operate about six hours per day. In the larger cities the operation of these plants at night is carried on to a large extent during the winter months. This will probably increase, more especially in centers where a large foreign born population will wish to more thoroughly Americanize themselves. In view of this probable situation, the artificial lighting of such buildings is of increasing interest and provision for such lighting should be made.

The modern school with metal windows affording adequate light, steam heating apparatus and wardrobe outside the room.

In many of the older schools it will be found that the possibilities of both systems of lighting are entirely inadequate. Legislation compelling correct lighting conditions will be enacted and it will be found that the existing building will, in many cases, present some difficult problems to the architect and the illuminating engineer. Where the daylight requirements cannot be fulfilled by added window areas it will be necessary to supplement such a condition with artificial illumination.

The main features of the code are here given to serve as a guide in the design of schoolhouses and

also as a basis for proposed state or municipal legislation.

Code of Lighting School Buildings

ARTICLE I. GENERAL REQUIREMENTS.—When in use, all buildings should be provided, during those hours when daylight is inadequate, with artificial light according to the following Articles:

Buildings hereafter constructed should be so designed that the daylight in the work space is reasonably uniform and the darkest part of any work space is adequately illuminated under normal exterior daylight conditions.

ARTICLE II. INTENSITY OF DAYLIGHT AND ARTIFICIAL ILLUMINATION.—The desirable illumination to be provided and the minimum to be maintained are given in the following table:

DESIRABLE AND MINIMUM ILLUMINATION

	Artificial lighting Foot-candles (Lumens per square foot)* At the work	
	Minimum	Ordinary Practice†
Storage spaces	0.25	0.5- 1.0
Stairways, corridors	0.5	1.0- 2.5
Gymnasiums	1.0	2.0- 5.0
Rough shop work	1.25	2.0- 4.0
Auditoriums, assembly rooms	1.5	2.5- 4.0
Class rooms, study rooms, libraries, laboratories, blackboards	3.0	3.5- 6.0
Fine shop work	3.5	4.0- 8.0
Sewing, drafting rooms	5.0	6.0-12.0
	Daylight illumination Foot-candles (Lumens per square foot)* At the work	
	Minimum	Ordinary Practice†
Storage spaces	0.5	1.0- 2.0
Stairways, corridors	1.0	2.0- 5.0
Gymnasiums	2.0	4.0-10.0
Rough shop work	2.5	4.0- 8.0
Auditoriums, assembly rooms	3.0	5.0- 8.0
Class rooms, study rooms, libraries, laboratories, blackboards	6.0	7.0-12.0
Fine shop work	7.0	8.0-16.0
Sewing rooms, drafting rooms	10.0	12.0-24.0

*The foot-candle is the measure of light intensity incident at right angles on a plane one foot distant from a light source of one candle-power. It should be borne in mind that intensity of illumination is only one of the factors on which good seeing depends.

†Under the column headed "Ordinary Practice," the upper portion of the range of intensities is preferable to the lower; where economy does not prohibit, even higher intensities than those cited are desirable.

The illumination intensity should be measured on the important plane which may be the desk top, blackboard, etc.

For other information see THE AMERICAN ARCHITECT, "Daylighting the Factory," February 20-March 13, 1918, and "Nightlighting the Factory," June 19-26 and July 10, 1918.

ARTICLE III. SHADING OF LAMPS.—Lamps should be suitably shaded to minimize glare. Glare, either from lamps or from unduly bright reflecting surfaces, produces eye-strain.

ARTICLE IV. DISTRIBUTION OF LIGHT ON THE WORK.—Lamps should be so arranged as to secure a good distribution of light on the work, avoiding objectionable shadows and sharp contrasts of intensities.

ARTICLE V. COLOR AND FINISH OF INTERIOR.—Walls should have a moderate reflection factor; the preferred colors are light gray, light buff, dark cream and light olive green. Ceilings and friezes should have a high reflection factor; the preferred colors are white and light cream. Walls, desk-tops and other woodwork should have a dull finish.

ARTICLE VI. SWITCHING AND CONTROLLING APPARATUS.—Basements, stairways, storerooms, and other parts of the building where required, should have switches or controlling apparatus at point of entrance.

ARTICLE VII. EMERGENCY LIGHTING.—Emergency lighting should be provided at main stairways and exits to insure reliable operation when, through accident or other cause, the regular lighting is extinguished.

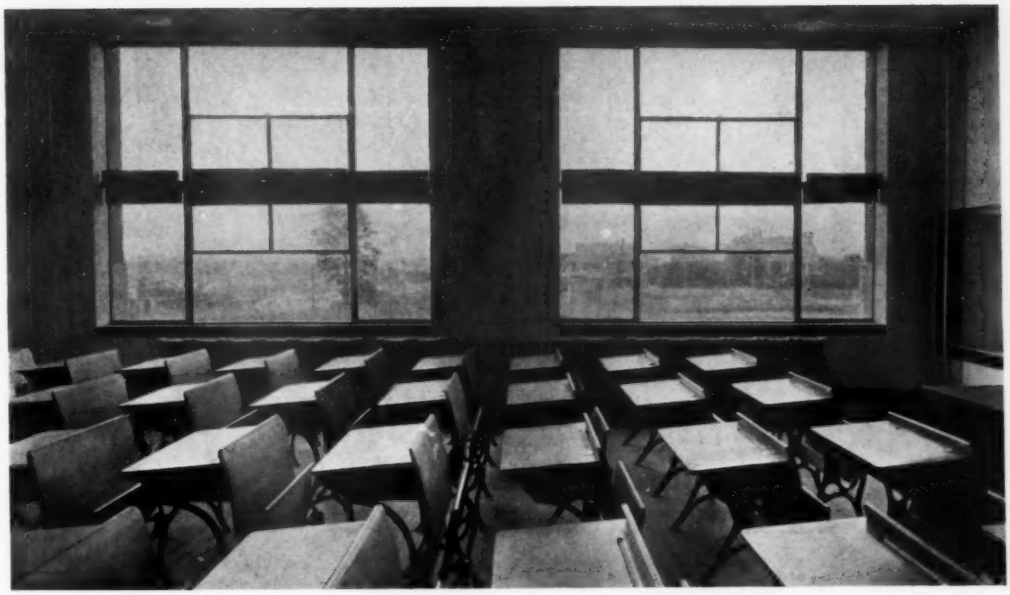
ARTICLE VIII. INSPECTION AND MAINTENANCE.—All parts of the lighting system should be properly maintained to prevent deterioration due to dirt accumulation, burned-out lamps and other causes. To insure proper maintenance, frequent inspection should be made at regular intervals.

The intensity of daylight illumination should be at least twice that of artificial illumination as the eyes are adapted to a much higher level of illumination (brightness) in the daytime.

The source of light is the sky and the area of the sky visible from the point to be lighted governs the amount of daylight at that point. From inspection it has been found that well lighted school rooms, facing a comparatively unobstructed horizon, are those wherein the visible sky subtends a minimum vertical angle of 5 deg. at any work point in the room. Where obstructions exist, such as nearby buildings, a greater glass area must be provided than ordinarily required or the use of prism glass be used to redirect the light within the room. The color of the walls of the adjoining building has a marked influence on the amount of light admitted. Light walls will reflect light, but the color and texture should be such as to avoid glare, which is always to be avoided. The measuring of these obstructions is explained in the article entitled "Daylighting the Factory," published in THE AMERICAN ARCHITECT of Feb. 20 and March 13, 1918.

Observation has also shown that the area of the window glass should be at least 20 per cent of the floor area of the school room under normal conditions. As the upper part of the window is the more effective part, the top of the opening should be as near the ceiling as possible. The sills should be approximately 3 ft. from the floor.

The fundamental rule for the proper lighting of the desk is that the light come from the left side. For this reason: the *unilateral* system of lighting,



HIGH SCHOOL, ALLENTOWN, PENNSYLVANIA. RHUE AND LANG, *ARCHITECTS*.

Well proportioned windows and wall piers. Curtains arranged to operate both ways from the meeting rail, affording complete control of light.

lighting by windows located on one side of the room only, is recommended, especially for class rooms. This is to apply to rooms not exceeding 24 ft. in width with windows about 12 ft. high. If the rooms are wider than this, the *bilateral* system of lighting, lighting by windows located on two sides of the room, may be required to provide sufficient ilumination in every part of the room, and at the same time to prevent too great a diversity of contrast in the intensity of light on the work space.

To secure the highest lighting value it is recommended that the room be so designed that no working location is more distant from a window than one and one-half times the height of the top of the window from the floor.

Windows at the left and rear, where practicable, are preferable to those on the left and right sides of the room, because of cross shadows created by the latter arrangement.

The sky as seen through a window is a source of glare. For this reason the seating arrangements should always be such that the pupils do not face the windows.

Although direct sunlight is desirable in interiors from a hygienic standpoint, it is often necessary to exclude or diffuse it by means of shades. These shades should perform several functions, namely, the diffusion of direct sunlight, the control of illumination to secure reasonable uniformity, the elimination of glare from the visible sky and the elimination of glare from the blackboards wherever possible. These requirements make it desirable to equip each window, especially in class rooms, with two shades operated by double rollers placed near the level of the meeting rail. The window shades may thus be raised or lowered from the middle, which provides the maximum elasticity for shading and diffusing the light. It will be noted that this method of installation permits of lowering the window from the top or raising it from the bottom without interference with the shades. The shades should be preferably of yellow-colored material that is sufficiently translucent to transmit a considerable percentage of the light while at the same time diffusing it.

A more complete control of the light may be obtained by the use of two independent sets of shades at each window. Where two sets of shades are used, one should be preferably a very dark green of heavy material that will exclude the light entirely, and the other preferably a yellow-colored material as above described.

Windows and overhead sources of natural light (so-called skylights), should be washed at frequent intervals and surfaces such as ceilings and walls should be cleaned and refinished sufficiently often to insure their efficiency as reflecting surfaces. It should be borne in mind that the main-

RAND HALL, CORNELL UNIVERSITY, GIBBS AND WOLTZ, *ARCHITECTS.*

A good example of combined side wall and saw-tooth skylighting. Especially adapted to places where vertical lighting is needed on vertical planes. Note absence of shadows on floor spaces indicating even distribution of light.

PULLMAN HIGH SCHOOL, CHICAGO. C. FRANK JOBSON, *ARCHITECT.*

A good example of metal window installation, showing the small shadows from the window parts, excellent ventilation afforded and good curtain arrangement for controlling light.

tenance of adequate daylight indoors is also dependent upon various external factors, such as the future erection of buildings and the growth of trees or vines.

The window itself is an important matter. The tendency now is toward the use of steel sash. The manufacturing of these sash is developed to a high state of perfection and the cost is relatively moderate compared with wood sash. The advantages are that they have the largest possible percentage of glass area of a wall opening and have small shadow parts. They are more durable, not being subject to decay or disintegration; they are easy to operate, not being affected by weather conditions such as cause shrinking and swelling; they do not containtain combustible material.

As the woodwork in a classroom is reduced to a minimum amount the color of its finish is of no particular moment and if finished dark it would absorb but little light.

Standardization of Schoolhouse Planning and Construction

By FRANK IRVING COOPER, *Architect*

ALL this week we have listened with intense interest to the speeches which have been made to us, and one reason for our interest has been that they all had some intimate connection with that one enormous subject which engrosses us all, "The War." It has thrown a powerful searchlight upon every kind of activity and we are looking at affairs from a new point of view.

According to reputable authorities we have been the world's spendthrift, and we must now try to learn where waste may be curtailed in every possible way, not only in the use of food, but in the use of materials, and under the latter heading in the use of building material. I do not mean that we must stop using building materials, but I do mean that we must be sure that the materials are being put to the best use in the most economical way. In the development of our present complicated building with laboratories, gymnasium, libraries, executive departments, etc., there has crept in an element of waste space and inefficient layout which almost always results in a waste of public money, and it is this waste which we hope in some way to abolish.

We have nothing that could be called standards of schoolhouse building. It is true that our state regulation has had a great growth during the past five years as shown in comparative charts for 1910 and 1915.

Chart I, of 1910, shows that but twenty-three states had laws or regulations dealing with school buildings. These laws and regulations dealt with twenty-six phases of the buildings. The agitation during the five years following the publishing of this chart resulted in the passing of regulations in ten additional states as well as the reviewing of the laws in many of the states having laws in 1910.

A redrafting of the chart in 1915, Chart II, showed that thirty-three states had regulations dealing with sixty-three phases of the building. We

CHART SHOWING STATUS OF COMPULSORY REGULATION OF SCHOOLHOUSE CONSTRUCTION IN THE UNITED STATES IN 1910.

COMPILED BY FRANK IRVING COOPER BOSTON

STATE	HEALTH	EDUCATION	PLAN: APPROVAL	PLAN: EXITS	PLAN: STAIRWAYS	PLAN: DOORS	PLAN: CORRIDORS	PLAN: LIGHTING	PLAN: AISLES	CONSTRUCTION: FRAME	CONSTRUCTION: COMPOSITE	CONSTRUCTION: FIREPROOF	CONSTRUCTION: FIRE-RESISTIVE	CONSTRUCTION: DOOR LOCKS	CONSTRUCTION: FURNITURE	CONSTRUCTION: FIRE ESCAPES	FIRE PROTECTION: FIRE ALARMS	FIRE PROTECTION: FIRE APPARATUS	FIRE PROTECTION: CONSTRUCTION	FIRE PROTECTION: HEATER ROOMS	SANITATION: HEATING	SANITATION: VENTILATION	SANITATION: SANITARIES	SANITATION: WATER SUPPLY	FURNISHINGS: DESKS	FURNISHINGS: SEATS	FURNISHINGS: BLACKBOARDS
ALABAMA		X	▨																								
ARIZONA																											
ARKANSAS																											
CALIFORNIA		X	■			■			▨													▨					
COLORADO				■	■																						
CONNECTICUT				■		■				■	■						■			■			■				
DELAWARE	X																					▨					
FLORIDA																											
GEORGIA																											
IDAHO																											
ILLINOIS																											
INDIANA		X						■														■					■
IOWA		X	■	■	■	■																					
KANSAS SEE NOTE D																		■		■							
KENTUCKY																											
LOUISIANA																											
MAINE		X	X	■	■	■		■	■													■					▨
MARYLAND				■	■	■																■					
MASSACHUSETTS				■	■	■		SEE	NOTE D	■								▨				■	▨				
MICHIGAN SEE NOTE C	X																					▨					
MINNESOTA	X	X	■					■	■													■					
MISSISSIPPI																											
MISSOURI																											
MONTANA		X							▨													▨	▨				▨
NEBRASKA																											
NEVADA																											
NEW HAMPSHIRE		X		▨																							
NEW JERSEY		X	■		■			■			■											■					
NEW MEXICO																											
NEW YORK		X		▨				▨														▨					▨
NORTH CAROLINA																											
NORTH DAKOTA	X	X			■																	■					
OHIO SEE NOTE B			■	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨		▨		
OKLAHOMA																											
OREGON																											
PENNSYLVANIA		X		■	■			■	■													■					
RHODE ISLAND		X		■	■																						
SOUTH CAROLINA																											
SOUTH DAKOTA		X	■			■		▨														■	▨				▨
TENESSEE																											
TEXAS																											
UTAH		X		■		■		■	■													■					■
VERMONT		X		■	▨	▨	▨	▨	▨	■	■											■	▨				▨
VIRGINIA		X		■		■				■	■											■					■
WASHINGTON																											
WEST VIRGINIA			▨																								
WISCONSIN																											
WYOMING																											

NOTE A THE PLANS FOR SCHOOL BUILDINGS IN THIS STATE MUST BE APPROVED BY STATE ARCHITECT

NOTE B THESE RULES ARE PREPARED BY DEPARTMENT OF INSPECTION OF WORKSHOPS FACTORIES AND PUBLIC BUILDINGS

NOTE C THESE LAWS AND REGULATIONS APPLY TO STATE BUILDINGS ONLY

■ INDICATES LAW ▨ INDICATES REGULATION

CHART I

Report of Committee on Standardization of School House Planning and Construction. Frank Irving Cooper, Chairman. National Education Association. 1918.

are now at work on a revision of this chart to show the amount of regulations as it stood in 1917.

If there were more uniformity in these laws they would be more valuable. As it is there is such a great variation that a building in one state would often be condemned if it were moved half a mile across the border into another state.

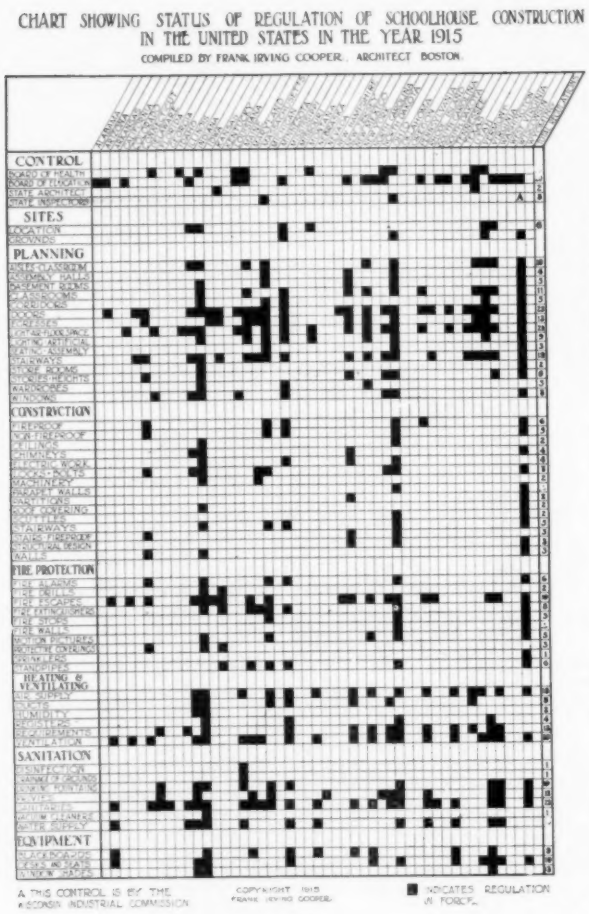


CHART II

To show how vitally this affects our pocketbooks, states having similar regulations, as Vermont, New Jersey, and Minnesota, require 50 per cent more area in classrooms per pupil than some of the other states and their taxpayers must pay $1.50 for every dollar that it costs their neighbors. This is simply one instance out of many, but it is obvious (without considering which is right) that there should be one best standard and that all states would be benefited by adopting it.

To assist in determining what is the best practice in school buildings is the object of our work. Our committee has had no standards of planning to go by. But what we did have was an enormous number and variety of school buildings now in active use which were ready for investigation with a view to determining what was most desirable in each and what was the best practice in division of space. I should premise any discussion of our school building tabulation with the statement that we have not tabulated a sufficient number of school buildings to warrant us in advancing final conclusions.

We have received plans of buildings from architects and superintendents in cities and towns of eighteen widely separated states. Some of these plans have been selected because the building was of a representative type, some because the architect was a leader in school planning, and some because they were highly recommended by school authorities.

The buildings were classed according to the school activity into six types, three under grade schools and three under high schools:

1. Grade schools of *one story* with auditorium, but having no basement and no gymnasium.
2. Grade schools of *two stories* with auditorium, but having no basement and no gymnasium.
3. Grade schools of *two stories* with basement, but having no auditorium and no gymnasium.
4. Junior high schools of *two stories* with auditorium and basement, but having no gymnasium.
5. High schools of *two stories* with auditorium, gymnasium and basement.
6. High schools of *three stories* with auditorium, gymnasium and basement.

Our method of tabulation has been, first, find the entire area of the building to be measured, the area of the basement and of all the floors; secondly, to measure the cross area of each wall, flue, room, closet, corridor—that is, of every part of the building that had area. If our tabulation showed an error of one-half of 1 per cent from the total area it was gone over until the error was found.

Our next step was to decide on an arrangement of the *main* divisions of the school building. Our divisions were: walls and partitions, flues, stairs and corridors, accessories, instruction and administration.

Walls, partitions, flues, stairs and corridors need no explanation. Accessories included unmarked spaces and spaces marked "playrooms," "storage," "closets," etc., that did not seem to have any connection with any of the main divisions. Instruction included all those areas used directly for some activity that goes to educate the pupil. The gymnasium and auditorium were included in this di-

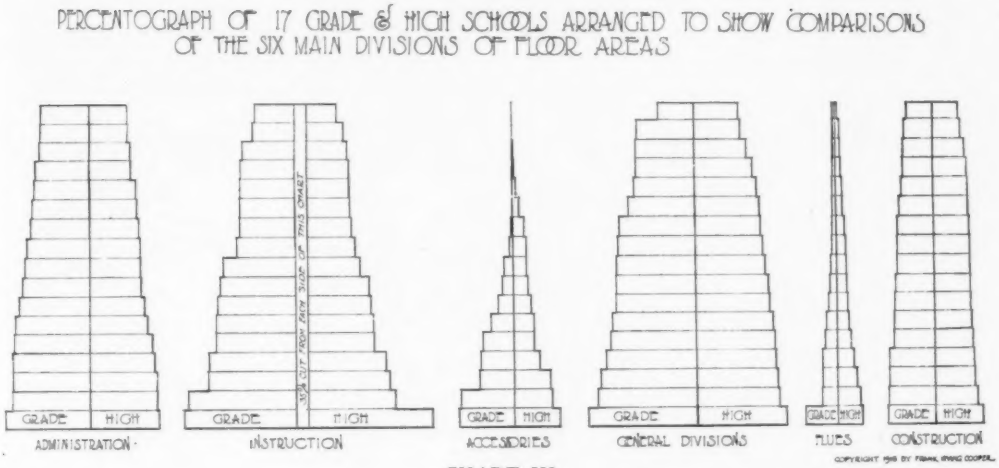


CHART III

vision. Administration included all areas connected with the government and maintenance of the school, the heating and ventilating plant, the sanitary provisions, and the wardrobes.

In preparing the tabulation of each building for study we used equal strips of cardboard 1 in. wide and 22 in. long, one for each building. Each strip represented 100 per cent and upon each were laid out spaces for the main divisions into which we divided the floor area. Upon the back of each strip was laid out the main subdivisions. These strips, which look like candles, could easily be arranged to show comparisons between the several divisions of the building without having in each case to lay out again a complete draft. Each chart has been made by bringing together "candles" representing the buildings we were to compare.

Without attempting any lengthy discussion of findings, I wish at present simply to make clear two points:

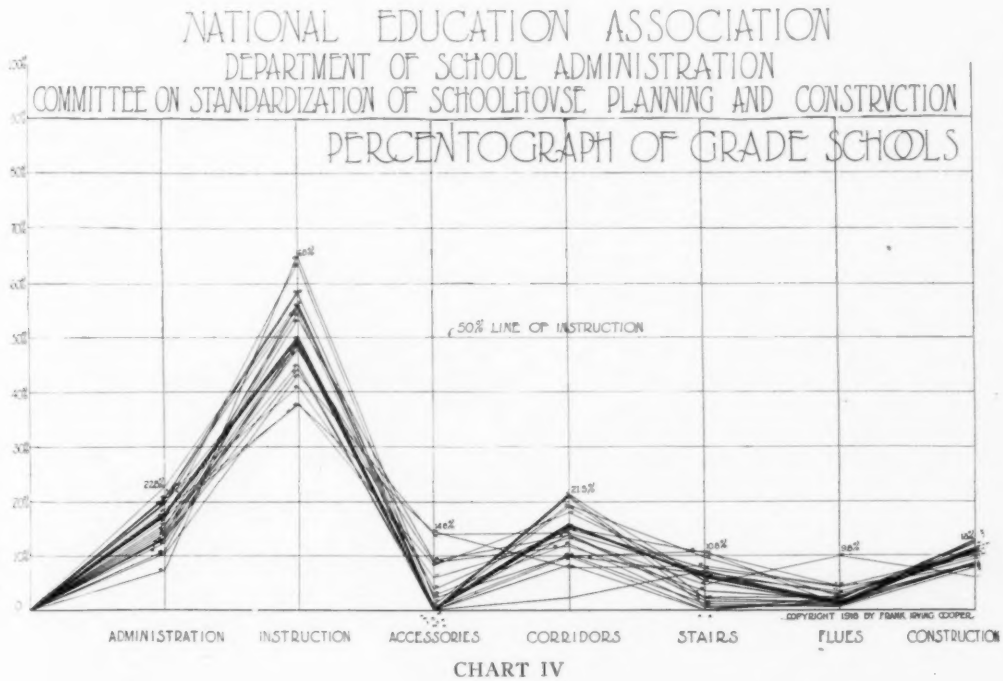


CHART IV

1. Unless later findings change present results both grade and high schools are comparable and any regulations as to minimum standards may cover both without any differentiation.

2. By means of charts covering a sufficient number of school buildings the best standards may be determined.

Chart III shows a comparison of the percentages of seventeen grade and seventeen high schools taken without any selection other than sequence and arranged under our six headings, walls and partitions, flues, stairs and corridors, accessories, instruction, and administration.

The grade schools are on the left, the high schools on the right, of a vertical line, which represents zero in the graphs of walls and partitions, flues, stairs and corridors, accessories, and administration, but which represents 35 per cent in the graph of instruction. Each horizontal section represents the percentage area occupied by a division in one school. A glance is sufficient to show that in high and grade schools percentage areas for each division are approximately symmetrical.

In Chart IV each light line represents the percentage area of a single school—the heavy black line represents a school building that had 50 per cent of the area for instruction. A similar chart, with a line for each school tabulated, showed that the average space for instruction was 50 per cent. We establish the 50 per cent line as the *norm* in instruction.

By taking the candle charts representing grade schools charts of grade schools were prepared showing percentage areas in each division. Schools showing high percentage area for instruction are low in accessories, stairs and corridors, and administration and indicate that the school officers and the architect had given proper study to all parts of the plan. Flues and construction being usually subject to definite regulations fall into groups of similar percentages and do not vary with relative values.

A chart constructed on the same principle as the chart for grade schools, but based on the investigation of high schools instead of grade schools, makes it evident that high schools and grade schools are comparable. The only reason for separating them has been the often-repeated argument that grade and high school buildings could not be covered by the same regulations. If the large number of high and grade schools investigated so far agree so closely there is no reason to think that further investigation will do other than confirm these results.

CHART V

Now the most important part of these school buildings is that devoted to instruction. If the space devoted to instruction falls below the 50 per cent line it is evident that there are some unusual conditions or that the plan has not received adequate study.

Chart V shows five Massachusetts high schools selected by agents of the Massachusetts Board of Education for tabulation by this committee. These five schools are in different cities of the state and range in size from 40,000 sq. ft. to over 200,000 sq. ft. in area. It was supposed that there would be little comparison. But these five high schools offer an interesting example of the close comparison that may be expected where superintendents and architects are working with a definite goal in view.

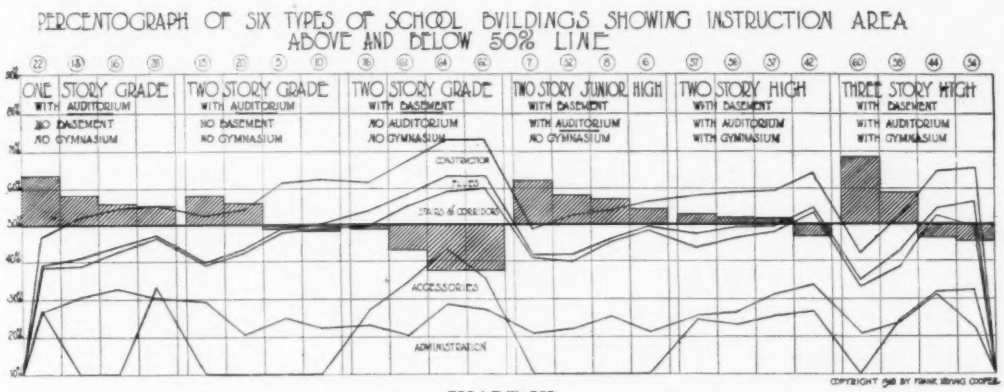


CHART VI

Chart VI shows a study of three types of grade schools and three types of high schools. The chart is constructed on the principle used for the preceding charts. Some schools in all the groups have space for instruction above the 50 per cent line, except grade schools of the old type. Of all the buildings examined those of two classes stand out as pre-eminently the best—the one-story grade school and the so-called junior high school.

Why is this so?

It is because these two types have been most carefully studied by our leading superintendents and our best schoolhouse architects. It is because they are a new type of school building and there are no bad habits of planning these buildings to be overcome. The superintendent and the committee have an open mind with regard to them, and the architect is allowed to carry out a building not planned on conventional lines with the usual extravagances. The possibility for improvement in the other types suggests that the time has arrived for getting together over the problems involved.

Here in general is the field to be covered:

1. The determination of best percentages and the adoption of minimum standards.
2. The unification of state regulations.
3. The investigation of building materials with special regard to the substitutes.
4. The problem of obtaining the greatest possible use from each part of the building. This fourth problem obviously depends upon the superintendent for its solution, being a problem of administration to be solved after the architect has done his share by providing the good school building for the good school.

To us this seems a fitting opportunity to lay out a national system to take up this work and make it of practical use for all parts of the country. We suggest the desirability of a general committee acting under the Department of Administration, a consulting body which should oversee the work, and a subcommittee in each state to supply information to every town or city which is about to build a school and to help them with advice as to the plans of school buildings. We suggest that there should be an inspection of school buildings and school building plans under a definite questionnaire and schedule to be prepared by the general committee, and that the results of these inspections should be tabulated and published.

Now the duty before the National Education Association is to educate the country so that it will demand better planned and more economical schoolhouses. We must continue to build school houses and they must not be overcrowded. We must have minimum standards which architect and superintendent will strive to raise and improve. This work should be carried on in a spirit of mutual helpfulness, any superintendent, committee, or architect should be able to turn to the committee of the National Education Association and obtain proper information and proper data.

Industrial Information

"This is Not a Piece of Copper Wire"

The Aero Alarm Co., 26 Cortlandt Street, New York, and 208 Columbia Street, Seattle, Wash., has sent out a sample of its patent fire finder. This copper tubing—which the company states is *not* "a piece of copper wire," is said to perform an inestimably valuable service as a fire finder.

Ex-Fire Chief Edward F. Croker of New York describes the processes very adequately as follows:

"The system consists of a small copper tube hardly larger than the lead of a pencil, tacked upon the ceiling of the floor or building to be protected. This tube, after running around the ceiling, ends in a diaphragm box. The tube, being hollow, always has air inside. It follows if the air in the room is heated, this air in the tube will heat and expand, pressing on the diaphragm. As there are relief vents leading to the atmosphere attached to the diaphragm box, any expansion of the air inside of the tube caused by the heat from registers, lights or grate, in the home or office does not move the diaphragm enough to send in an alarm, as the vents relieve the pressure before the alarm goes in from local causes, but if a blaze starts, the heat waves rise at once and spread through the space, striking the tube and causing the air in the tube to expand very rapidly, far beyond the relief capacity of the vents; the diaphragm then bends out, making an electrical contact, and the signal is sent to the office or engine room, telling where the fire has started; simultaneously, bells ring on every floor, notifying the employees to leave the premises.

"At the same time the floor number is struck on large gongs for general identification, and the building number of the fire box is sent direct to fire headquarters, calling the fire department to the scene.

"As all of this happens from ten to thirty seconds from the start of the smallest blaze, and all these remarkable results are obtained automatically with apparatus of great simplicity, it would seem that at least our inventors have discovered a means of controlling our heaviest national waste, and preventing a repetition of the heavy loss of lives sustained in recent fire horrors in the country."

Johns-Manville Building Materials

Catalog No. 304 of the Johns-Manville Company, which has offices in all the principal cities of this country and Canada, is a large paper bound book dealing very exhaustively with the products manufactured by that company.

The story of asbestos is told first. It forms a very interesting tale, accompanied as it is with explanatory illustrations.

The tests and experiments made by the company are also set forth in this book. They lead to descriptions of Johns-Manville asbestos roofs of the following types:

1. In built-up forms, for use on roof decks with a minimum pitch of ¼ inch to the foot and maximum pitch of 6 inches.

2. In ready-to-lay form with white top. For use on roof decks where incline is not less than 3 inches to the foot.

3. In ready-to-lay form with black top. For use where incline is not less than 1½ inches to the foot.

4. In shingle form, for use on any building where a shingle roof can be applied. Maximum pitch 4 inches to the foot.

5. In corrugated form, for use directly on any purlins on skeleton roof structures.

Details of the various types of construction, tables of sizes and weights, and standard specifications are given for all of these classifications. A series of very attractive colored plates is given, showing the different colors and combinations of asbestos shingles available.

The second half of this book is given over to describing the roofing accessories, hair insulator, asbestos wood, asphalt mastic flooring, waterproofing and many other products of this company. Elaborate specifications are given for the asphalt mastic flooring.